

DOCUMENT RESUME

ED 068 447

SP 005 902

TITLE Basic Program Plan. Condensed Version.  
INSTITUTION Stanford Univ., Calif. Stanford Center for Research  
and Development in Teaching.  
SPONS AGENCY Office of Education (DHEW), Washington, D.C.  
PUB DATE Mar 72  
CONTRACT OEC-6-10-078  
NOTE 265p.

EDRS PRICE MF-\$0.65 HC-\$9.87  
DESCRIPTORS \*Educational Development; \*Program Costs; \*Program  
Descriptions; \*Program Development; \*Research and  
Development Centers

ABSTRACT

This condensed version of the Basic Program Plan for the Stanford Center for Research and Development in Teaching (SCDRT) outlines the proposed plans of substantive programs over the next several years (beginning December 1, 1972). Information on projected costs and the Center's institutional capabilities for administering, reviewing, and supporting the plans of the respective programs is provided. Summary information and program descriptions are provided for three programs: teaching effectiveness, the environment for teaching, and teaching students from low-income areas. Institutional descriptions covering organizational and operational questions, personnel, support services, relationships with other agencies and new directions are included. Appendixes include SCRDT material.  
(MJM)

ED 068447

STANFORD CENTER FOR RESEARCH AND DEVELOPMENT IN TEACHING

School of Education  
Stanford University

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BASIC PROGRAM PLAN

March 31, 1972

Condensed Version

Research and Development Center Number:	R15S
Contract Number:	OEC-6-10-078
Name of Institution:	Stanford University
Title of Center:	Stanford Center for Research and Development in Teaching
Name of Center Director:	Robert N. Bush

SP 005 902

### A Note on the Condensed Version

In response to a directive from the United States Office of Education, this Center has prepared a Basic Program Plan outlining the proposed plans of its substantive programs over the next several years (beginning December 1, 1972), with information on projected costs and on the Center's institutional capabilities for administering, reviewing, and supporting the plans of the respective programs. Much of the information required by the Office of Education for this document is also of interest to others concerned with the work of SCRDT.

This condensed version of the Basic Program Plan omits certain detailed information required for federal government planning but not essential to an understanding of the work of the Center. The pages presented here retain the original numbering.

Those already familiar with the work of the Center should consult pp. 1-4, 1-14, and 1-22 for statements of the relations between the program and component titles used in this document and those used in earlier reports. The programs and components were renumbered in the Annual Budget Justification dated October 11, 1971; to avoid confusion, the identifying code numbers for components not currently funded or being phased out in 1972 have been retained.

We hope that this document will provide friends of the Center with a useful statement of its salient accomplishments and the plans for which future funding will be sought.

Robert N. Bush

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INTRODUCTION: TEACHING

## INTRODUCTION: TEACHING

### An Overview of the Mission and Program of the Stanford Center for Research and Development in Teaching

The mission of SCRDT is to improve teaching in American schools. The current pace of change in today's world is unprecedented. The individual is battered by messages from a world-wide instantaneous communications network that has no parallel in history. Under these circumstances, education has of necessity become a matter of lifelong learning. While some critics allege that schools as educational institutions are no longer relevant, still the dominant view is that free and effective schooling, if such be possible, is more than ever a keystone for a genuinely democratic society that aims to provide everyone, not just the affluent, with full opportunity to develop his talents and to enjoy an abundant life. In schooling, the fundamental concern is the student's learning, in both general and specific terms. And in this concern, teaching and the teacher are of prime importance. If the teaching is effective, other factors matter less. If the teaching is ineffective, little else helps.

In attempting to improve teaching, we constantly anchor our efforts to the learning of the student. Thus the teaching-learning link and the teacher-student relationship become the central consideration of our work. But teachers and students do not exist in a vacuum. There is a school and community environment that influences what they do. Hence, we are also concerned in our studies with the nature of that environment for teaching and learning.

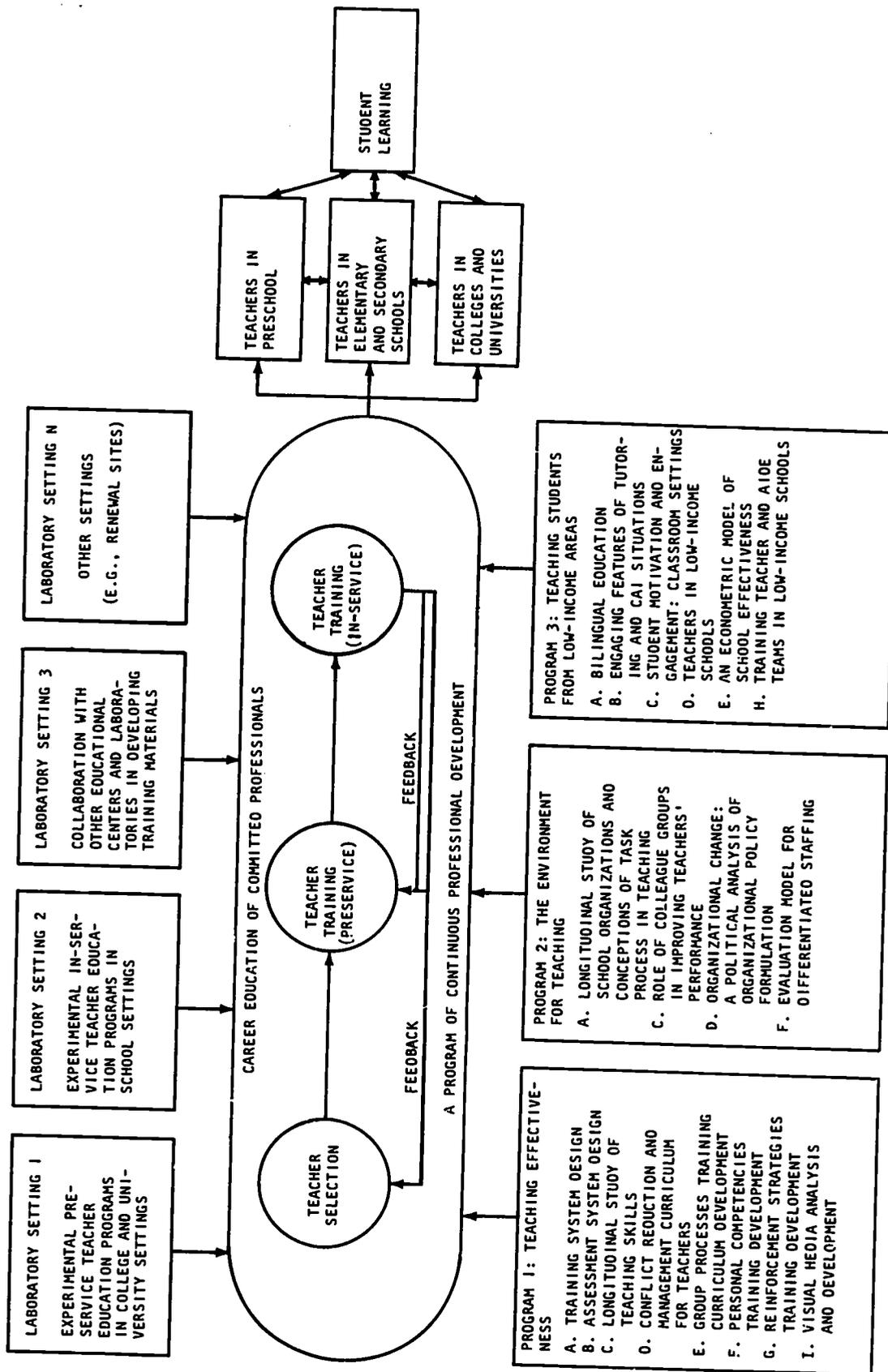
The Center is interested not merely in studying teacher-pupil interaction in the school environment, but rather in intervening and helping to shape the future. The detailed objectives, strategies, and anticipated outcomes of Programs 1 and 2, as set forth in this Basic Program Plan, make clear the ways in which we are working toward a more effective and relevant kind of teacher-student interaction in different and more effective patterns of school organization.

Program 3 attacks another crucial problem affecting many children. It attends to the critical question of whether a newly envisioned relationship between teacher and pupil and an appropriately designed environment will really work in our most sorely troubled schools, namely, those in the economically depressed urban and rural areas where the children from poor families go to school. Relevant and effective schooling for individuals and families of low income is one of the important bases for hope that our society can break the self-perpetuating circle of ignorance, poverty, unemployment, disease, and crime. Hence, while being concerned with new and more effective relationships between all teachers and students, and the creation of more supporting environments, we are giving special attention to determining what will and will not work in educating those who are poor economically and who consequently suffer in so many ways as a result of that disadvantage.

Another way of viewing the Center's program as a whole may be seen in the diagram on the following page.

The central large oval in the diagram represents our concern with the critical element in schooling: a corps of dedicated, highly competent, well-trained professional teachers who are committed to a career in teaching. With a sufficient basic corps of such persons, large numbers of less highly trained persons, committed for shorter periods, can be absorbed and properly used in the schools. Indeed, the model of a differentiated staff appears to be one of the more promising ideas on the educational horizon, but only if it is properly conceived and executed. We are actively at work on this problem. But without a stable, highly trained, and dedicated central group, the schools will surely suffer badly, and the quality of education will seriously deteriorate. Signs of such danger are already appearing.

The three main programs of the Center represented in the three rectangles at the bottom of the diagram are all working toward the achievement of the goal represented in the center of the diagram. It is necessary that we have a valid understanding of what is happening in the school system as it now operates if we are ever to change it. What works? What doesn't work? Why? Hence, each program has compo-



nents that have a large element of research in them. But these are not random inquiries. Each has its links to remedies that are being proposed. For example, each of the programs is concerned with factors that relate to what causes good teachers to stay in teaching, to become committed. Why do teachers drop out, especially from schools in low-income areas? How much relates to selection of the right person; how much to the kind of initial training; how much to early socialization processes as well as to the kind of in-service training during their first few years; and how much to the environmental conditions in the school and the surrounding community? At least three components, one from each program, are or have been concerned with these problems. The career prediction studies in the Longitudinal Study of Teaching Skills component of the program on Teaching Effectiveness (Component 1C, to be merged into Component 1A); Component 3D on Teachers in Low-Income Schools in the Low-Income program; and Component 2A (Longitudinal Study of School Organizations and Conceptions of Task Process in Teaching) in the Environment for Teaching program are each different, but all three are mutually reinforcing and in enlightening ways contribute to this important concern of the Center as a whole.

Another example deals with teacher behavior, or performance in the classroom. The Training System Design component (1A) of the Teaching Effectiveness program, the component on Student Motivation and Engagement in Classroom Settings (3C) of the Low-Income program, and Component 2C on the Role of Colleague Groups in Improving Teachers' Performance (Environment for Teaching program) all bear on the central problem of improving the teacher's classroom actions.

As we focus first at one point on teacher preservice programs, then at another upon in-service activities, we are continually feeding back the results to improve upon the other parts (note arrows in the central part of the diagram). Increasingly, we see these parts merging, and we are beginning to look at them together as one program for continuous professional development, replacing the old in- and preservice dichotomy. (See Appendix C, Excerpts from Report of Teacher Education Task Force, Stanford University School of Education, March 1972.)

The rectangles at the top of the diagram represent our use of various laboratory settings for basic inquiry, for designing and testing training systems and products that are generated in the various Center programs. The Teaching Effectiveness program has used extensively, though not exclusively, the Stanford Teacher Education Program (STEP), a laboratory setting of Type 1, where microteaching was originally created and the earlier studies of the technical skills of teaching were carried out. STEP has also been the locale for the components on Longitudinal Study of Teaching Skills (1C) and Group Processes (1E) (both now being incorporated in Component 1A), as well as Component 1D (Conflict Reduction and Management) and the Small Group Interaction (3G) component (reports currently being written). This pattern will change during 1973, when the School of Education's teacher education programs are likely to move into a totally new pattern, partly as a result of infusion of Center R&D work. Consequently, the Center's activities in this laboratory setting may be expected to change substantially in the next few years.

The Teaching Effectiveness program has also used local school district sites, laboratory settings of Type 2, for studying and fashioning in-service training, as for example, in the Reinforcement Strategies (1G) and Uncertainty Studies (1H; reports being completed) components. Given their nature, the Environment for Teaching and the Low-income programs from the beginning have relied more heavily on school systems (also Type 2 laboratory settings). Our programs have used laboratory settings of Type 3, which represents other centers and regional laboratories, most prominently the Far West Laboratory, in developing first Minicourses, and now, protocol materials. The new building will provide greatly expanded and new types of laboratory settings.

The existing and potential targets of our work are represented in the rectangles on the right-hand side of the diagram. Our initial efforts were more directed at the secondary school level. Increasingly in recent years we have been attending more to the earlier school years, and we hope to move soon to new programs at the college and university levels. In the long run, the latter may be the level of greatest influ-

## Intro-6

ence in improving teaching in all schools. For if it be only partly true that teachers teach as they have been taught, then what happens to students in college when they are being trained for teaching may be pivotal in preparing them for or blocking them from a new conception of their role as teachers.

This brief overview of the work of the Center as a whole, in which the interrelationship of the many parts may be seen, has been presented at the outset because it may not be easy to see in what follows in this Basic Program Plan, which focuses on each of the programs separately and attends primarily to the numerous and important details of their components.

I. SUMMARY INFORMATION

Program Code 

R	I	S	S	I
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I-3

Date Prepared 3/24/72

Stanford Center for Research  
Institution and Development in Teaching

PROGRAM REGISTER\*

Program Title Program on Teaching Effectiveness

Code No.	Title of Component or Activity	Person In Charge	Start Date	End Date
IA	Training System Design	N.L. Gage R.E. Snow	9/65	11/75
IA1	Technical Skills	N.L. Gage R. Shavelson	9/69	11/75
IA2	Teacher Training Automat	N.L. Gage	9/70	11/75
IA3	Student Aptitude as Input and Output	R.E. Snow	3/72	11/75
IA4	Feedback to Teachers	N.L. Gage R.E. Clark	9/72	11/75
IB	Assessment System Design	N.L. Gage R. Shavelson	12/70	11/75
IB1	Assessment of Teacher Performance	N.L. Gage R. Shavelson	4/72	11/75
IB2	Assessment of Teacher Training System	R. Shavelson	12/70	11/75
IC	Longitudinal Study of Teaching Skills	R.H. Koff	9/65	12/72
ID	Conflict Reduction and Management Curriculum for Teachers	R.H. Koff	2/71	8/73
IE	Group Processes Training Curriculum Development	R.H. Koff	2/71	12/72
IF	Personal Competencies Training Development	C. Thoresen	7/68	11/75
IG	Reinforcement Strategies Training Development	P.S. Sears	2/70	8/73
II	Visual Media Analysis and Development	R.E. Clark	12/72	11/74

\* See following page for statement of relation of FY 72 components to those for FY 73.

Relationship of FY 72 Components to Those for FY 73

Program on Teaching Effectiveness  
(Formerly Heuristic Teaching)

FY 73 Component Number	Title	FY 72 Component Number
1A	Training System Design	1A
1A1	Technical Skills	*
1A2	Teacher Training Automat	*
1A3	Student Aptitude as Input and Output	New
1A4	Feedback to Teachers	New
1B	Assessment System Design	1B
1B1	Assesemnt of Teacher Performance	New
1B2	Assessment of Teacher Training System	*
1C**	Longitudinal Study of Teaching Skills	1C
1D	Conflict Reduction and Management Curriculum for Teachers (Formerly entitled Crisis Resolution)	1D
1E**	Group Processes Training Curriculum Development (Formerly entitled Group Processes)	1E
1F	Personal Competencies Training Development (Formerly entitled Personal Competencies)	1F
1G	Reinforcement Strategies Training Development (Formerly entitled Reinforcement Strategies)	1G
1H**	Uncertainty Studies	1H
1I	Visual Media Analysis and Development	New

\* Previous Program Registers have not listed separate activities within components. This activity existed in FY 72.

\*\* No direct Center funding in FY 1973; work continued under Component 1A.

1-5  
PROGRAM RESUME

Program Code: 

R	I	S	S	I
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Stanford Center for Research  
Institution: and Development in Teaching Date Prepared: 3/24/72  
Program Title: Program on Teaching Effectiveness  
Start and end dates of (proposed) Program: 9/65 - 11/75  
Staff member in charge: N.L. Gage

Teachers lack understanding and mastery of effective teaching skills and strategies, and existing pre- and in-service teacher education programs are inadequate for developing such skills and evaluating their effects on students. To improve teacher effectiveness in performing tasks and filling roles required to enhance student achievement, motivation, and long-term aptitudes, this program will develop a Model Teacher Training System, to be used as part of a total teacher education program.

A component on Training System Design will plan, develop, and apply the system as a whole. In addition, this component will develop specific teacher skills (e.g., questioning, explaining, and listening); nonprogrammed materials assembled in a Teacher Training Automat; materials for measuring student aptitude as an input in applying aptitude-treatment interactions and an outcome to enhance learning abilities for the student's long-range future; and teacher feedback systems to improve the teacher's adaptation to the needs of students, beginning with feedback based on student ratings and on an electrical signal system included in the new SCRDT research facility.

Other components of the program will contribute elements to the system, including a curriculum in conflict reduction and management for teachers; techniques for improving the personal competence (self-management abilities) of teachers and students; effective reinforcement strategies for teachers; and guides to the use of visual media in training teachers and in educating their students.

An Assessment System Design component will develop procedures for evaluating and improving the system, based on measures of teacher performance and effects on students. This component will also examine more general problems of assessment of teacher performance.

The Model Teacher Training System will be field tested and revised until it meets criteria for distribution and installation.

The immediate outcomes of the program will be improved teacher behavior. Ultimate outcomes, as indicated above, include improvement in student achievement and, it is hoped, in long-range student aptitudes.

## COMPONENT RESUME

Component Code: 

R	I	S	T	A
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Institution: Stanford Center for Research  
and Development in TeachingDate Prepared: 3/24/72Program Title: Program on Teaching EffectivenessComponent Title: Training System DesignStart and end dates of (proposed) Component: 9/65 - 11/75Staff member in charge: N.L. Gage, R.E. Snow

This component is concerned with the development of the Model Teacher Training System. The planning and execution of the system as a whole will be a major concern of the component. In addition, specific elements of the system will be developed here. These include the elements on teaching skills such as questioning, explaining, and listening to be included in the programmed part of the system, and a Teacher Training Automat to be included in the nonprogrammed part of the system. Work on the improvement of training materials and procedures for questioning, explaining, listening, and other technical skills will be conducted with a view to developing packageable and transportable materials readily adaptable in programmed form in a wide variety of-preservice and in-service, including vestibule, teacher training programs. To make the system adaptable to trainee characteristics of various kinds, research on student aptitude in the aptitude-treatment interaction paradigm will be conducted. Similarly, student aptitude as an outcome of teaching-learning processes will be studied with the goal of enhancing the long-term learning capabilities of students after their formal schooling has ended.

A new part of this component consists of the development of materials and procedures for improving two kinds of feedback to teachers concerning their current students: feedback of ratings from students to teachers and feedback of signal system information from students to teachers. Previous experiments on the effects of feedback of ratings will be used as the basis for new approaches designed to increase those effects and to ascertain their significance for teacher behavior, as recorded by trained observers, and for teachers' effects on student achievement of cognitive and affective objectives. The signal system research will use electrical facilities being built into the large-group instructional area of the Center's new building, to be occupied in September 1972.

## COMPONENT RESUME

Component Code: R I S I BInstitution: Stanford Center for Research  
and Development in TeachingDate Prepared: 3/24/72Program Title: Program on Teaching EffectivenessComponent Title: Assessment System DesignStart and end dates of (proposed) Component: 12/70 - 11/75Staff member in charge: N. L. Gage, R. J. Shavelson

This component has two parts. An activity on the assessment of teacher performance is aimed at developing procedures, materials, and guidelines for assisting school districts in California in complying with a new state law requiring the assessment of teacher performance in terms of student achievement. This law, effective September 1, 1972, raises complex and sensitive problems of measurement, evaluation, statistical analysis, the definition of achievement, and the like. The work in this activity will consist of the organization of conferences of experts in the relevant disciplines and practices (educational and psychological measurement, curriculum, supervision, and administration) from the state's school districts, the State Department of Education, and colleges and universities. Reports on the papers, discussions, and recommendations of these conferences will be disseminated to the school districts of the state and other interested parties, and will have applications extending well beyond the State of California.

The activity on the assessment of the teacher training system will be aimed at providing an assessment of the Model Teacher Training System being developed within the program. This assessment element will deal with the teacher trainee's aptitudes, performances, behaviors, attitudes, and values, and his effects on student achievement of cognitive and affective objectives. Procedures and materials for evaluating the effectiveness of each of the systems' components will be designed and validated against immediate (trainee performance), intermediate (student achievement), and ultimate (student aptitude) criteria.

## COMPONENT RESUME

Component Code: 

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Stanford Center for Research  
Institution: and Development in TeachingDate Prepared: 3/24/72Program Title: Program on Teaching EffectivenessComponent Title: Conflict Reduction and Management Curriculum for TeachersStart and end dates of (proposed) Component: 2/71 - 8/73Staff member in charge: R. H. Koff

To make teachers better able to reduce and manage conflict arising in their classrooms and schools, this component will develop a curriculum based on the theory of role-conflict and mixed messages. The component will review the literature related to school disruption and teacher role conflict in order to develop a theoretical basis for the curriculum, which is to be used in pre- and in-service teacher education programs as part of the Model Teacher Training System.

This component will define and operationalize critical variables thought to be related to school disruption. Research with measuring instruments aimed at these variables--instruments-based on various kinds of discrepancy scores between actual and ideal behaviors of teachers as seen by teachers and their students--will be used to explore other ways in which teachers can redefine their roles so as to meet student needs more effectively and thereby reduce student disruption and violence. The procedures and measuring instruments will be tested in the field with teachers and students. The effectiveness of the conflict reduction and management curriculum will be assessed in terms of its ability to bring about desired changes in teacher behavior.

## COMPONENT RESUME

Component Code: **R I I S I I F**Institution: Stanford Center for Research  
and Development in TeachingDate Prepared: 2/24/72Program Title: Program on Teaching EffectivenessComponent Title: Personal Competencies Training DevelopmentStart and end dates of (proposed) Component: 7/68 - 11/75Staff member in charge: C. E. Thoresen

To improve teachers' skill in managing their own behaviors, internal and external, and their effects on the behaviors of students, this component will employ behavior modification techniques to achieve major objectives enunciated by humanistic psychologists and educators. The resulting "behavioral humanism" will be based on experimental studies in the assessment of imagery behavior, modification of imagery responses, the use of anxiety management techniques, the use of social modeling, the reduction of self-critical covert verbalization, and self-control of physiological responses such as heart rate.

Within the next two years, materials such as a training procedure for developing teachers' skills in observing their own covert and overt responses will be readied for field testing in the Model Teacher Training System. Additional materials will be prepared for improving teacher competence in self-observation, environmental planning, and individual programming. (Environmental planning refers to ability to arrange one's own external environment so that it will be conducive to desired behavior. Individual programming refers to the use of internal stimuli and consequences so as to bring about desired behavior.)

During FY 73, techniques for improving self-observation in classroom and simulated-classroom settings will be developed. The work will be done with individual subjects and will use an "intensive design," one that permits continuous monitoring of the behavior of a single subject over time. During FY 74, the work will be continued, in the absence of the Component Leader, by an appropriate R&D Associate employed for that year to work on training procedures for environmental planning and individual programming skills.

## COMPONENT RESUME

Component Code: R I S I G  
Stanford Center for Research  
Institution: and Development in Teaching Date Prepared: 3/24/72  
Program Title: Program on Teaching Effectiveness  
Component Title: Reinforcement Strategies Training Development  
Start and end dates of (proposed) Component: 2/70 - 8/73  
Staff member in charge: P. S. Sears

This component is aimed at developing training procedures for helping teachers improve the achievement, self-concept, and belief in internal control of children from low-income areas. Preliminary studies and workshops have been carried out, and the component is currently conducting a year-long in-service training program.

During FY 72, this component will complete reports and preparation of materials based on the investigations since 1969. During FY 73, various lines of evidence will be pulled together. Data collected on teacher behavior, student counseling, and student leadership projects will be analyzed to test hypotheses concerning the effectiveness of these approaches to the improvement of student behavior, motivation, self-concept, and conceptions of locus of control. Reports, procedures, and materials will be prepared for inclusion in the Model Teacher Training System in forms suitable for widespread installation, adaptation, and use.

## COMPONENT RESUME

Component Code: R I S I I I  
Stanford Center for Research  
Institution: and Development in Teaching Date Prepared: 3/24/72  
Program Title: Program on Teaching Effectiveness  
Component Title: Visual Media Analysis and Development  
Start and end dates of (proposed) Component: 12/72 - 11/74  
Staff member in charge: R. E. Clark

To furnish rationales, techniques, and materials for matching visual media to educational purposes, this component will develop a taxonomy of visual media. This taxonomy will be integrated with knowledge concerning individual differences among students relevant to their learning and knowledge of tasks to be learned. The component will produce a handbook, based on the taxonomy, that will assist in the selection and use of media in research on teaching, in the development of instructional materials, and in the development of new educational technologies.

Program Code 

R	1	5	S	2
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I-13

Date Prepared 3/24/72

Stanford Center for Research  
Institution and Development in Teaching

PROGRAM REGISTER \*

Program Title Environment for Teaching

Code No.	Title of Component or Activity	Person In Charge	Start Date	End Date
2A	Longitudinal Study of School Organizations and Conceptions of Task Process in Teaching	F.A. Brunetti E.G. Cohen S.M. Dornbusch J.W. Meyer S.R. Molnar W.R. Scott	7/68	11/76
2C	Role of Colleague Groups in Improving Teachers' Performance	S.R. Molnar	2/71	11/76
2D	Organizational Change: A Political Analysis of Organizational Policy Formulation	J.V. Baldrige	7/68	9/74
2F	Evaluation Model for Differentiated Staffing	F.A. Brunetti	9/71	7/73

\* See following page for statement of relation of FY 72 components to those for FY 73.

Relationship of FY 72 Components to Those for FY 73

## Environment for Teaching

FY 73 Component Number	Title	FY 72 Component Number
2A	Longitudinal Study of School Organizations and Conceptions of Task Process in Teaching (Formerly Component 2A, Consequences of Innovation in Educational Organizations, and Component 2B, Evaluation of Teachers)	2A 2B
2C	Role of Colleague Groups in Improving Teachers' Performance	2C
2D	Organizational Change: A Political Analysis of Organizational Policy Formulation	2D
2E*	Case Studies of the Teacher's Role in Traditional and Innovative Elementary Schools	2E
2F	Evaluation Model for Differentiated Staffing	New

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\* No direct Center funding in FY 1973; work completed in FY 1972.

## PROGRAM RESUME

Program Code: **R 1 5 S 2**Institution: Stanford Center for Research  
and Development in TeachingDate Prepared: 3/24/72Program Title: The Environment for TeachingStart and end dates of (proposed) Program: 7/68 - 11/76Staff member in charge: E.G. Cohen

**Problem.** The Environment for Teaching program has been studying the effects on teachers and learners of such organizational factors as (1) the evaluation of teachers; (2) the way teachers are organized; (3) teachers' participation in decision making. Empirical findings of these studies reveal severe limitations in the conventional organization of schools; these limitations are felt to prevent the technical-professional development of the staff. The school is also limited in its ability to modify teacher behavior in order to improve learner outcomes. Our studies indicate that organizational innovations such as team teaching in open-space schools appear to have significantly positive impact on teachers and learners. Nevertheless, these organizational changes raise new and different problems, particularly in the group functioning of teams and in the evaluation of the teaching task.

**Objectives.** The program objective is knowledge of how to design school organizations that will be in harmony with desired conceptions of the teaching task and will produce desired effects on teachers and learning outcomes.

**Strategy.** We are now beginning a longitudinal study of the relationship of the organizational status of teachers to changes in the teaching task. Some of the current innovations in curriculum and instruction place tremendous demands on the teacher's role, especially in evaluation, diagnosis, and professional problem solving. In this longitudinal study we will select certain complex innovations and compare their persistence in schools where the teacher's role has been restructured but the conceptions of teaching and learning remain traditional.

We have hypothesized that some of the conceptions of the teaching task process now being developed cannot survive for long in a conventionally-organized school. We have envisioned two models of school organization with the capability of analysis, diagnosis, and evaluation demanded by these new techniques. The two models have been labeled the Collaborative Teacher Group Model and the Staff-Line Support Arrangement Model. If our expectations are supported by data from the longitudinal study, then we will plan to test in a more powerful way the effectiveness of new organizational models in managing, adapting, and making successful new teaching tasks.

**Projected outcomes.** The major expected outcome of this program is a general model for changing school organizational structures to accommodate new teaching task processes. In addition, research instruments are being converted to packaged form suitable for the evaluation of organizational innovation by teachers and administrators. The long-term goal is an evaluation package for use by administrators who wish to examine the effects of organizational innovation. Also, a treatment for improving the group problem-solving process of the collaborative teacher group is being developed as a result of our intensive studies of team teaching.

## COMPONENT RESUME

Component Code: 

R	1	5	S	2	A
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Institution: Stanford Center for Research  
and Development in TeachingDate Prepared: 3/24/72Program Title: The Environment for TeachingComponent Title: Longitudinal Study of School Organizations and Conceptions  
of Task Process in TeachingStart and end dates of (proposed) Component: 7/68 - 11/76Staff member in charge: F.A. Brunetti, E.G. Cohen, S.M. Dornbusch, J.W. Meyer,  
S.R. Molnar, W.R. Scott

Problem. Past studies in the program have revealed the limitations in conventional school organization; these limitations are seen as preventing technical-professional development of the staff and restricting the school's ability to modify teacher behavior in open-space schools. The problems in organization are now more critical than ever; with the invention of new conceptions of the teaching task process, the present organization of schools will severely impede the adoption and effective use of innovations in teaching.

Objective. To understand the changes in organization necessary for the successful maintenance of complex conceptions of the teaching task process.

Strategy. We are now beginning a three-year longitudinal study (titled "The Organizational Status of Teachers and Change in Teaching Tasks") of variations in school organization as they relate to variations in the conceptions of task process in teaching. We are focusing on three kinds of school organizations and three kinds of conceptions of task process. School organizations selected for study will be of the conventional variety and of two kinds of complex structure: Collaborative Teacher Group Model and Staff-Line Support Arrangement. At one extreme, we will select schools which have adopted conceptions of task process with strong demands for a professional problem-solving capability in the school. At the other extreme, we will select schools with traditional conceptions of task process. We have hypothesized that some of the conceptions of task process now being adopted in schools cannot survive for long in a conventional organization.

The total sample will be approximately 200 schools. If the data support the predictions, an organizational experiment will be planned for schools planning to adopt a highly complex conception of the task process. Organizations participating in the experiment will be modeled after arrangements we have found to be associated with successful use of complex task conception. Control organizations will adopt the new techniques, but will be judged by the persistence of the new procedures, effectiveness of the evaluation system, learner outcomes, and the status and morale of teachers.

Projected outcomes. Knowledge of the necessary organizational conditions for successful innovations in teaching tasks. Administrators making decisions about innovation, and developers of new technology, should be the audience for this knowledge so that they can make more effective estimates of the costs and changes required for the effective adoption of changes in teaching.

## COMPONENT RESUME

Component Code: **R | I | S | S | 2 | C**Institution: Stanford Center for Research  
and Development in TeachingDate Prepared: 3/24/72Program Title: The Environment for TeachingComponent Title: The Role of Colleague Groups in Improving  
Teachers' PerformanceStart and end dates of (proposed) Component: 2/71 - 11/76Staff member in charge: S.R. Molnar

Problem. Colleague groups of teachers such as teaching teams have the potential for providing collegial evaluation, resulting in improved instructional performance. However, teams are not now focusing on such evaluation. The few training procedures which exist for such groups focus on interpersonal relations, but largely ignore the specific tasks confronting a colleague group of teachers. Thus even "trained" teachers have difficulty in utilizing the colleague group effectively.

Objectives. The effective use of teacher colleague groups for individual professional growth of teachers through evaluation and improvement of individual teaching performance. Intervention techniques will be developed which emphasize the specific tasks of a teaching team, including (a) analysis of group expectations for individual performance consistent with instructional goals, and (b) colleague evaluation and assistance from colleagues in planning improvement in individual performance.

Strategy. A system for evaluating the effectiveness of group functions is being developed along with a method for diagnosing problems and appropriate "prescriptions" for intervention. The diagnostic and intervention techniques will be used within ongoing teacher groups as they carry out their group tasks. Materials will be developed for training teachers and administrators in analyzing and improving group functions as they affect professional evaluation and improvement of individual instructional performance.

Projected outcomes. Groups which are trained with the task-specific methods being developed will be able to provide professional evaluation which results in continual improvement of individual performance in instruction, and the growth of the teaching task process.

## COMPONENT RESUME

Component Code: 

R	I	S	S	2	D
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Stanford Center for Research  
Institution: and Development in Teaching Date Prepared: 3/24/72  
Program Title: The Environment for Teaching  
Organizational Change: A Political Analysis of  
Component Title: Organizational Policy Formulation  
Start and end dates of (proposed) Component: 7/68 - 9/74  
Staff member in charge: J.V. Baldrige

Problem. The problem in this component is trying to understand the decision dynamics that affect successful organizational change in a highly professionalized organization. The literature on organizational theory stresses the difference between professional organizations (such as schools and colleges) and other types of institutions. However, the research on the decision systems in those organizations is extremely limited. Our task is thus to study decision processes in highly professionalized organizations, to understand the dynamics by which faculty professionals influence academic planning and innovation, and to plan processes for creatively harnessing those dynamics in order to change organizational systems. The problem is being studied through a random sample of institutions in higher education.

Objectives. Acquisition of information about the conditions that support or undermine teacher morale, exploration of the educational professional's role in policy making at his institution, analysis of the political processes that govern internal decision making, and links from that process to the contextual environment of the institution.

Strategy. A random sample of 300 schools and 18,000 faculty members constitutes the knowledge base. Questions aimed at both the institutional and the individual faculty level measure the determinants of faculty unionization, the influence patterns that teachers exert on academic planning, and the structural and organizational patterns that facilitate innovation. Data collection was completed in 1971, and data analysis has now begun. The huge amount of data will require long-term, systematic exploration with considerable additional computer analysis. 1972 and 1973 will be used for this intensive data analysis. In 1974, during the final reporting of the results from this analysis, there will be systematic feedback from this component to the rest of the Environment for Teaching program. Practical outcomes from this decision-level analysis will be linked to the innovations proposed for the organizational experiment by the rest of the program.

Projected outcomes. A number of theoretical reports and one case history have been completed. Additional R&D Memoranda and Technical Reports are expected from the preliminary data analysis. Then, in 1974, there will be at least one and probably two major research monographs arising from the basic research component of the project. One of these will describe the present status of faculty participation in decision making at the higher education level in the United States.

## COMPONENT RESUME

Component Code: 

R	1	5	S	2	F
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Institution: Stanford Center for Research  
and Development in TeachingDate Prepared: 3/24/72Program Title: The Environment for TeachingComponent Title: Evaluation Model for Differentiated StaffingStart and end dates of (proposed) Component: 9/71 - 7/73Staff member in charge: F.A. Brunetti

Problem. As schools develop variations in cooperative task arrangements, there is a greater need for, but a general lack of, adequate evaluation materials. School administrators need to determine the effectiveness of cooperative structures for both students and teachers, and to identify areas of needed improvement. The purpose of this component is to develop an evaluation model for differentiated staffing that can be used by school district administrators to assist in the ongoing development of new organizational arrangements for teaching.

Objectives. The main objective is to adapt and extend the research methods and instruments of the Environment for Teaching program in developing evaluation strategies, methods, and instruments for differentiated-staffing structures. Specific objectives in developing the model include:

1. Formative and summative components, with the capability of providing input data in administrative decision making for program development and data for use in making policy-level judgments about the relative merits of an organizational innovation.
2. Methods of identifying appropriate program goals and formulating comprehensive structural objectives that can be used (a) to identify relevant evaluation activities and (b) to provide a value framework for the interpretation of data.
3. Evaluation components to contain appropriate elements for use in PPBS activities commonly being developed in most school systems.
4. An evaluation system that can be efficiently and economically self-administered by school district staff.

Strategy. A local school district has contracted with the Environment for Teaching program to develop the evaluation component of an experimental state-supported differentiated staffing project, thus providing both financial support for the early development work and insuring the relevance of the evaluation model. Field testing in several school districts will take place in the 1972-73 fiscal year. Criteria for evaluating the effectiveness of the model will be based on the four objectives listed above. The Far West Regional Laboratory will be involved in the final development and dissemination in the 1973-74 fiscal year.

Projected outcomes. The evaluation model will consist of a series of elements, each containing the following: (a) a process for developing a comprehensive goals and objectives structure; (b) appropriate evaluation instruments; (c) training manuals, videotapes, and exercises; (d) computer programs, and (e) data format and instructions for interpretations.

Program Code **R 1 5 S 3**

1-21

Date Prepared 3/24/72

Stanford Center for Research  
Institution and Development in Teaching

PROGRAM REGISTER \*

Program Title Teaching Students from Low-Income Areas

Code No.	Title of Component or Activity	Person In Charge	Start Date	End Date
3A	Bilingual Education	R. Politzer	7/68	6/75
3B	Engaging Features of Tutoring and CAI Situations	M.D. Fisher R.D. Hess	7/68	9/75
3C	Student Motivation and Engagement: Classroom Settings	R.D. Hess	2/71	11/75
3D	Teachers in Low-Income Schools	R.D. Hess	2/71	11/74
3D1	Engagement and Morale	R.D. Hess	2/71	11/74
3D2	Teacher Turnover	A. Harnischfeger	11/71	11/74
3E	An Econometric Model of School Effectiveness	H.M. Levin	2/69	11/72
3H	Training Teacher and Aide Teams in Low-Income Schools	R.D. Hess	12/72	11/75

\* See following page for statement of relation of FY 72 components to those for FY 73.

Relationship of FY 72 Components to Those for FY 73

## Teaching Students from Low-Income Areas

FY 73 Component Numbers	Title	FY 72 Component Numbers
3A	Bilingual Education (Extension of former Component 3A, Teaching Standard English as a Second Dialect)	3A
3B	Engaging Features of Tutoring and CAI Situations (Formerly entitled Student Motivation and Engagement: Tutorial Settings)	3B
3C	Student Motivation and Engagement: Classroom Settings	3C
3D	Teachers in Low-Income Schools	3D
3D1	Engagement and Morale (Formerly Component 3D, Teacher Commitment and Engagement)	
3D2	Teacher Turnover	New
3E*	An Econometric Model of School Effectiveness	3E
3F*	Educational Community Organization	3F
3G1*	Use of Small Groups in a Changing School	3G1
3G2*	Small Group Interaction	3G2
3H	Training Teacher and Aide Teams in Low-Income Schools	New

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\* No direct Center funding in FY 1973; work completed in FY 1972.

## PROGRAM RESUME

Program Code: 

R	1	5	S	3
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 Institution: Stanford Center for Research and Development in Teaching Date Prepared: 3/24/72  
 Program Title: Teaching Students from Low-Income Areas  
 Start and end dates of (proposed) Program: 7/68 - 11/75  
 Staff member in charge: R.D. Hess

Problem. A basic problem in low-income areas exists in the cultural and socioeconomic disparity between the experiences and goals of teachers and school administrators, and the experiences and concerns of students and the community. Teachers and administrators therefore need to deal more effectively with problems of communication and motivation in the low-income school setting. We assume that children in low-income areas can learn if the educational atmosphere is conducive, and that teachers can be committed to teaching if they can engage students in the classroom and are given appropriate institutional support and incentives.

Objectives. To gain knowledge and develop training materials dealing with conditions (teacher strategies, ethnicity, desegregation, teacher attitudes toward black dialect, bilingual classes, group size, etc.) which affect motivation (engagement) of students in low-income schools. To gain knowledge about conditions which affect teacher turnover and holding power in low-income schools and prepare materials on which policy affecting teaching conditions can be based. If resources are available, to develop a training program for teacher and aide teams in bidialectal/low-income schools. To develop techniques for selecting teachers for low-income schools.

Strategy. Observational studies of actual classroom teaching strategies and student engagement; experimental studies of tutor-student and computer-student interaction; studies of teacher engagement and principal behavior through interviews, written instruments and behavioral observations; studies of bilingual education involving auditory and written instruments; feedback sessions for teachers and other school personnel; and techniques for teaching teacher strategies for engaging students.

Projected outcomes. Developmental efforts will include experimental approaches to the modification of teacher behavior; in-service training components with training materials for teachers and administrators; an in-service training program for teacher and aide teams; bilingual ability tests; and techniques for teacher selection and evaluation.

## COMPONENT RESUME

Component Code: 

R	I	S	S	3	A
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Institution: Stanford Center for Research  
and Development in TeachingDate Prepared: 3/24/72Program Title: Teaching Students from Low-Income AreasComponent Title: Bilingual EducationStart and end dates of (proposed) Component: 7/68 - 6/75Staff member in charge: R.L. Politzer

Problem. This component addresses two distinct but related problems: (1) We know very little about the long-range effects of bilingual education on students' linguistic abilities, self-concept, and attitudes toward their cultural background. (2) In order to devise appropriate teaching strategies for Black children it is essential to determine their competence in both standard and nonstandard speech. However, there is a lack of instruments designed to measure proficiency in either nonstandard (Black) English or standard (Black) English.

Objectives. Design a test to measure standard and nonstandard Black dialects and a test to measure ability in the use of English or Spanish. The latter test will be used to measure the impact of bilingual education. Both tests would be designed to elicit more positive attitudes from teachers toward nonstandard-speaking children and toward bilingual education.

Strategy. The Black English test will be designed and validated using scores in reading achievement and/or teachers' ratings of pupils. The effects of the test and its accompanying manual on teachers' attitudes and behavior toward nonstandard speech will also be assessed.

The effects of a bilingual education program will be determined by giving the English-Spanish proficiency test to students in bilingual studies and comparing their scores with those of matched groups of students in monolingual programs.

Projected outcomes. (1) A test and manual to measure proficiency in nonstandard dialects and to improve teachers' attitudes toward nonstandard speakers. (2) A much-needed longitudinal assessment of bilingual education efforts, including knowledge of the characteristic behaviors of successful bilingual teachers.

## COMPONENT RESUME

Component Code: **R 1 5 S 3 B**

Stanford Center for Research

Institution: and Development in TeachingDate Prepared: 3/24/72Program Title: Teaching Students from Low-Income AreasComponent Title: Engaging Features of Tutoring and CAI SituationsStart and end dates of (proposed) Component: 7/68 - 9/75Staff member in charge: M.D. Fisher, R.D. Hess

Problem. Human tutoring and computer-assisted instruction (CAI) have been highly recommended and widely used methods of teaching low-income students; but we do not have adequate information about the various strategies available which "engage" low-income students and promote academic achievement.

Objectives. (1) Identify tutoring strategies which promote a range of student behaviors from rapport-building to high-level engagement; use this information to design training programs for teachers, aides, and tutors. (2) Utilize CAI to study theoretical and situational variables that might influence children's engagement levels, and investigate the effects of these variables upon children from different ethnic groups if the previous CAI research indicates that such comparisons will produce increased understanding of ethnic group differences in engagement.

Strategy. (1) A tutor training project aimed at developing in-service training methods will be established. Videotape sessions in combination with tutor observation scales will be used to provide tutors with feedback concerning the effectiveness of their strategies. A separate tutoring manual currently being developed and information on the CAI research will provide additional sources of training materials. (2) CAI programs varying in difficulty levels, choice of problems, reward systems, pacing, and types of software will be presented to children from low-income schools. An attempt will be made to assess differences in engagement which result from the effects of these variables.

Projected outcomes. (1) Information derived from the tutoring activity will be used to design and test prototypic tutor training programs which can accelerate the growth of effective tutoring techniques. (2) In the CAI activity, knowledge concerning the influence of CAI on the engagement levels of different ethnic groups will assist educators in identifying the most appropriate treatments for children from low-income schools.

## COMPONENT RESUME

Component Code: 

R	1	5	S	3	C
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Stanford Center for Research

Institution: and Development in TeachingDate Prepared: 3/24/72Program Title: Teaching Students from Low-Income AreasComponent Title: Student Motivation and Engagement: Classroom SettingsStart and end dates of (proposed) Component: 2/71 - 11/75Staff member in charge: R. D. Hess

Problem. This component addresses two distinct but related problems: Available research knowledge on the conditions and teaching techniques effective in engaging low-income students is severely limited. Moreover, teachers and administrators in low-income schools are increasingly skeptical of the value of educational research.

Objectives. Identify and describe (a) effective engagement strategies used in low-income schools, (b) effects of learning environments on engagement, and (c) teachers' differential effectiveness with children from different ethnic groups. Develop an instrument to measure student engagement. Develop useful feedback procedures for schools and individuals involved in educational research.

Strategy. A short-term longitudinal study using teachers in low-income schools will be continued. After participating in research, teachers will be involved in a pilot feedback workshop. Development of teacher training in student observation techniques is also planned.

Projected outcomes. Findings from the study of effective engagement strategies will provide an empirical basis for the preparation of training procedures for teachers in low-income schools. Development of teacher feedback procedures will have positive consequences for R&D Centers, Regional Laboratories, and others who are applying educational research to the solution of American educational problems.

## COMPONENT RESUME

Component Code: 

R	1	5	S	3	D
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Institution: Stanford Center for Research  
and Development in TeachingDate Prepared: 3/24/72Program Title: Teaching Students from Low-Income AreasComponent Title: Teachers in Low-Income Schools: Activity 1, Engagement and  
MoraleStart and end dates of (proposed) Component: 2/71 - 11/74Staff member in charge: R.D. Hess

**Problem.** There is little systematic information on the structural and individual factors which engage teachers and maintain their commitment in low-income schools. Educational administrators particularly need such information in their attempts to cope effectively with such factors as aide training and alienation of low-income students and parents.

**Objectives.** Describe the relationship between patterns of engaged teacher behavior and standard indicators of morale and satisfaction (attitudinal measures, request for transfer, and teacher dropout). Describe the interrelationship of structural and individual student and teacher variables and patterns of engaged behavior and attitudes of teachers.

**Strategy.** This component is proceeding in two stages: (1) Case study of a high morale, low-income school with a Mexican-American student population, using the student engagement instrument developed by the 3C component, attitudinal measures of teacher morale and efficacy, extensive teacher and principal interviews, and classroom observation by experienced teachers in addition to the teacher engagement instrument. (2) Selection of low-income schools from the same district, all serving primarily Mexican-American students, on the basis of extreme rate of teacher turnover (high and low). Comparison of these sample schools on selected structural variables, student engagement and achievement, and teacher engagement patterns. If funding is sufficiently expanded, a comparison sample of schools will be drawn from a second large district which serves a predominantly black student population. Data on teacher engagement will be gathered from the Component 3C sample of teachers and will be examined for corroboration of multiple-school results.

**Projected outcomes.** (1) Recommendations on personnel policy, teacher aide and principal training and selection in low-income schools. (2) Identification of developmental routes which have high potential for providing teachers and principals in low-income schools with skills in redesigning teaching tasks to bring them into line with available resources. (3) Description of impact of organizational and individual teacher characteristics upon the response of engaged teachers to imposed change.

## COMPONENT RESUME

Component Code: **R 1 5 S 3 D**Institution: Stanford Center for Research  
and Development in TeachingDate Prepared: 3/24/72Program Title: Teaching Students from Low-Income AreasComponent Title: Teachers in Low-Income Schools: Activity 2, Teacher TurnoverStart and end dates of (proposed) Component: 11/71 - 11/74Staff member in charge: A. Harnischfeger

**Problem.** Teacher turnover, defined as leaving a teaching position in a specific school, is considered to have negative effects on the school. Previous studies have indicated that the teacher turnover rate is a function of sex and years of experience. Further, it is said that the teacher turnover rate is especially high in low-income schools. Studies of teacher turnover using an entire school district as the base may obscure variations among individual schools within the district. We are therefore also concerned with the analysis of factors which affect teacher turnover in a specific school.

**Objectives.** Investigate the multiple factors which affect teacher turnover (i.e., dropout or transfer). Important factors are presumably characteristics of the school, the community, and the students; characteristics of the teacher, the teacher's colleagues, and other school staff; and characteristics of the program, school organization, and school policy.

**Strategy.** Taking the school as a unit of analysis with multiple variables, we will study teacher turnover within and between elementary school districts. The analysis will include regression analyses using multiple explanatory factors and will involve a reanalysis of the Coleman data.

The study began in two school districts in the Bay Area. We plan to include further school districts in the Bay Area in the following years (two per year). At the same time, we will do followup studies of the previously investigated districts. For the districts used in Component 3D1 (teacher engagement and morale) this study's variables will be added to the analysis.

**Projected outcomes.** Answers to the following questions: Do particular characteristics of schools, pupils, and/or district policy determine teacher turnover? Are there situations under which highly engaged teachers (teachers with high morale) are more likely to drop out or transfer? Findings will be especially important for policy with respect to assignment of classroom personnel. Appropriate materials for dissemination of results will be prepared.

## COMPONENT RESUME

Component Code: 

R	I	S	S	3	H
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Institution: Stanford Center for Research  
and Development in TeachingDate Prepared: 3/24/72Program Title: Teaching Students from Low-Income AreasComponent Title: Training Teacher and Aide Teams in Low-Income SchoolsStart and end dates of (proposed) Component: 12/72 - 11/75Staff member in charge: R.D. Hess

Problem. As a result of federal and state programs in education, a potential instructional agent--the teacher's aide--has become part of the low-income setting. These aides are usually trained to work with teachers. However, teachers are rarely systematically trained to work with their aides.

Objectives. Utilize the research findings from Components 3A - 3D to design a "model" teacher/aide training program that concentrates upon (a) training teacher and aide teams to promote high levels of student engagement in classroom settings, and (b) assessing teacher/aide relations in the classroom and their effects on student engagement in learning.

Strategy. The research findings and measurement instruments from Components 3A - 3D will be applied to training teachers and aides to work in the classroom. Thus, the 3A component will provide trainees with information about techniques for measuring children's bilingual abilities and their susceptibility to receiving bilingual instruction. The 3B research findings will identify particular types of educational variables (such as task difficulty levels) that can be effectively applied to tutoring activities, while the 3C project will provide data to the program developers about the effects of different types of educational feedback procedures upon improving teaching abilities. The final input for designing this training component will be the questionnaires and research findings from project 3D. These findings will be particularly important in (a) identifying the engagement levels, morale, and commitment of the teacher/aide teams, and (b) providing information about the possible effects of the training program upon these characteristics. In addition, the component staff will work closely with school district administrators, teachers, and aides in developing procedures and materials.

Projected outcomes. The teacher/aide training program will yield systematic information concerning which instructional methods can promote effective classroom behaviors. The outcomes of this component will be used to (a) develop model training programs for teacher/aide teams, (b) develop aide selection procedures, (c) determine the effects of such teams on the organization of student learning in the classroom, and (d) provide relevant materials and recommendations to school systems that are developing training programs.

IIA. PROGRAM DESCRIPTION

Program 1, Teaching Effectiveness

## 11A. PROGRAM ON TEACHING EFFECTIVENESS

Program Description

This Program Description is organized in accordance with the questions stated in the Basic Program Plan Guidelines, "Suggested Outline of Basic Program Plan" under "11. Program Description." The successive questions presented under the latter headings are considered in turn.

The first section of this Program Description provides answers to Questions A, B, and C. The remaining sections provide additional detailed answers to Question C--specifically, how will the program be carried out?--for each of the program's six major components.\*

Question D--How will the program's success, both in general approach and in specific procedures, be evaluated?--is answered in two ways:

(a) Activity 1B2 (Assessment of Teacher Training System) describes the ways in which the program's major goal, a Model Teacher Training System, will be evaluated. (b) The descriptions of each of the program's components contain descriptions of the ways in which that component's success will be evaluated.

Question E--Who will carry out the program?--is answered for each of the components. A brief description of the background of training and experience of each of these component leaders is provided in Appendix A.

Question F--What resources will the program require?--is answered in the general budget description for the program, which appears on pages 11A-96 through 11A-101.

Question G--What is the program's relationship to other programs or to long-range goals of the institution?--is answered in the description of each of the program's components and in the Introduction to this Basic Program Plan.

Question H--What has the program accomplished so far?--can be answered generally as follows. The program has formulated and developed

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\*Eight components are listed on pp. 11A-4 and 5. As indicated later, on December 1, 1972, two of these components will be incorporated into Component 1A, Training System Design.

a radically new paradigm for the improvement of teaching. This new paradigm consists essentially of a tool-development approach to the preparation of teachers for the performances to be required of them as the role of the teacher changes in the decades ahead. The new role will require teachers to do what is uniquely human and cannot be done by machines, programs, and media of various sorts. The new role will entail much more tutoring, work with small groups, and complex, higher-order interactions with students. The tools with which to prepare teachers for this role will be incorporated into the program's Model Teacher Training System, whose outlines are presented as part of this Program Description. The conception, formulation, and partial execution of this systematic approach to the improvement of teacher training, on the one hand, and of teaching itself, on the other, are the program's major accomplishments so far. The details of these accomplishments are contained in the plans presented below and in the earlier publications of the program. Several key publications are cited in the following text and in the accompanying References. A comprehensive summary of much of the work through late 1970 is contained in Accomplishments '70 published by SCRDT in 1971. The complete answer to Question H can be fully obtained only through an examination of the Center's earlier publications and reports.

What problem will the program attack, or what opportunity will it take advantage of? What are the anticipated outcomes? What difference will the program make?

The problem to be attacked by this program is broad, widespread, and serious: Most teachers now use an outmoded information-dispensing mode aimed at filling passive students with facts. Yet the times require teaching styles that promote teacher-student cooperation, inquiry, the enthusiasm that leads to life-long learning, and all aspects of human growth--intellectual, emotional, and social. (The term "heuristic" was until recently applied to this kind of teaching within this Center. Because that term was often understood as having narrower

connotations than those intended, we have changed the name of the program to that indicated above.)

The problem can be restated as follows: Teachers lack understanding and mastery of effective teaching skills and strategies. Existing teacher education programs--both preservice and in-service--are inadequate for developing such skills or evaluating their effects on educational outcomes.

A major aspect of the problem to be attacked is the general inadequacy of the "performance" part of contemporary teacher education programs--that part in which the prospective or already working teacher acquires skills and strategies through actual performance of some kind other than merely reading, writing, and talking about them. Until a decade ago, the main avenue for the acquisition of performance skills was student teaching. That avenue proved to be too cumbersome for the kind of control, manipulation, and systematic evaluation that modern training technology has shown to be feasible in other domains.

One part of the solution, developed at Stanford, was microteaching--the scaled-down teaching encounter that puts teachers into a training situation with a small number of students, for a short time, on a delimited part of the teaching task (e.g., making an assignment, eliciting participation, or providing reinforcement). The value of the microteaching approach has been demonstrated through research on its effects on teacher behavior and through its widespread adoption and adaptation. Hundreds of teacher education programs throughout the world have used the approach in one form or another.\* The Far West Laboratory used the approach in a highly structured, packaged, and self-administrable form in its Minicourses.

The Program on Teaching Effectiveness is aimed at greatly extending and improving the performance part of teacher education programs

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\*For information on its use in the United States, see B. E. Ward, A survey of microteaching in NCATE-accredited secondary education programs. R&D Memorandum 70. Stanford, Calif.: SCRDT, 1970 (ED 046 894). Microteaching has also been used in Canada, England, Scotland, France, Germany, the Netherlands, Israel, Australia, New Zealand, Botswana, and South Africa.

by developing a Model Teacher Training System. This system will incorporate, along with the microteaching-minicourse approach, a number of other approaches aimed at providing training in the performance of the effective teacher's role. Among the approaches to be considered are the following, arranged in approximate order of their similarity to the actual teaching-learning situation in the school:

- Laboratory training of human subjects in learning experiments
- Simulators and simulation games
- Role playing
- Tutoring
- Microteaching and Minicourses
- Teaching regular classes

Thus, the anticipated outcomes of the program are a set of highly usable, flexible, and effective training procedures, organized into a coherent system. The difference to be made by this system is that of raising dramatically the degree to which effective teaching is practiced in our schools.

The program will take advantage of the special opportunity created by the new California law requiring all school districts to establish and follow guidelines for the assessment of teacher performance. As described below, one component activity will consist of work designed to assist in compliance with that law while at the same time developing procedures and tools applicable in the improvement of teacher assessment in all other states.

What overall strategy will be used to achieve the desired results?

The results will be achieved through a program of research and development consisting of the components described below. These components and their leaders are the following:

- 1A. Training System Design (N. L. Gage and R. E. Snow)
  - 1A1. Technical Skills (N. L. Gage and R. J. Shavelson)
  - 1A2. Teacher Training Automat (N. L. Gage)
  - 1A3. Student Aptitude as Input and Output (R. E. Snow)
  - 1A4. Feedback to Teachers (N. L. Gage and R. E. Clark)

- 1B. Assessment System Design (N. L. Gage and R. J. Shavelson)
  - 1B1. Assessment of Teacher Performance (N. L. Gage and R. J. Shavelson)
  - 1B2. Assessment of Teacher Training System (R. J. Shavelson)
- 1C. Longitudinal Study of Teaching Skills (R. H. Koff)
- 1D. Conflict Reduction and Management Curriculum for Teachers (R. H. Koff)
- 1E. Group Processes Training Curriculum Development (R. H. Koff)
- 1F. Personal Competencies Training Development (C. E. Thoresen)
- 1G. Reinforcement Strategies Training Development (P. S. Sears)
- 1I. Visual Media Analysis and Development (R. E. Clark)

The general lines of inquiry and development to be pursued fit together into an attack on selected major parts of the overall problem area delineated above. In this Program Description section, only brief outlines of each of these components are provided; more detailed component descriptions are provided below.

Alternative strategies were considered and discarded when the overall strategy of developing the Model Teacher Training System was chosen instead of a more traditional program of research and development. In a more traditional program, a series of basic research investigations consisting of correlational and experimental studies would have been carried out. These studies would have been aimed at delineating in greater detail some of the solutions to basic problems. Among these problems are those concerning the definition, measurement, manipulation, and effects of the kinds of teacher behaviors with which the program is concerned.

Instead, the present strategy consists of going much more directly to the development of materials and procedures for training teachers in the kinds of behaviors hypothesized to constitute effective teaching. In this "tool-development" strategy, further elaborated elsewhere (Gage, 1971), the experimental variables take the form of manuals, training devices, and other concrete materials specifying training procedures and programs. Each variable has an assessment component built into it, so that the results of the research and development effort can be self-correcting.

The advantages of the present procedure take the form of savings in time and money. The work proceeds on the basis of "strong inference"

from the whole context of research on teaching and learning. It adopts an "as if" approach, in that the development work proceeds as if fairly well-established knowledge is available. But the experimental, evaluative components prevent error from persisting. The orientation toward product development insures the exportability and replicability of the independent variables in experiments on changing teacher behavior. It also insures that the outcome of the work will be improved cumulatively, since the resulting product will be readily available for further work. In more traditional research approaches, the methods of manipulating or measuring the independent and dependent variables have not often been "packaged." Hence they have been unavailable in readily replicable form to other investigators. Each component of the present program will yield a product, i.e., a manual with detailed training procedures, a game, a test, etc., that will be exportable and useful in further training and research.

Our strategy in the past has been to analyze specific teaching skills and develop specific products and training procedures aimed at these isolated skills. In the fall of 1969, the development of a "second generation" of research on teaching skills was discussed (Snow, 1969). It was recognized that while considerable progress had been made in the analysis of teaching in Phase I of the program, it was now necessary to consider more directly how individual teaching skills could be integrated into sequences of effective teaching performance and how student behavior could finally be made the basic working criterion for research on teaching. Our strategy is now to synthesize the component teaching skills into an integrated teacher training system, evaluated in terms of an integrated system of learning criteria.

During the first half of FY 70, we carefully examined the reports of the USOE site visiting team and our own Advisory Panel. These reports praised our research but noted that a coordinated strategy for development seemed lacking. Products were developed only occasionally and in piecemeal fashion. We have also studied contemporary literature on the concept of development to arrive at a view of development in R&D centers that has been applied to the Program on Teaching Effectiveness.

A hierarchy of possible conceptions of development can be sketched. At the simplest level there is "implication stating," where one derives implications for practice from the outcome of individual research studies. These simple outcomes may be routine by-products of many kinds of research, but programmatic research is typically not necessary to obtain development of this sort. Second, there is "product stringing," which consists of the production of individual films, tapes, manuals, syllabi, and sundry other pieces of training material. At best, groups of these specific products are strung together by some common thread, as for example, groups of films and manuals on teaching skills. This is the level of development on which our program worked until 1970. Although such development is valuable, it appears unlikely that an integrated training program can ever be built from mere collections of products at this level. Third in the development hierarchy is "course production," perhaps best exemplified by the Far West Laboratory's Mini-courses. These are month-long, in-service training sequences, each dealing with a cluster of teaching skills, such as questioning or tutoring. They are designed as complete self-instructional units, to be installed in schools as such. So far we have approached this level of development only in our occasional training institute and workshop activities. "Development systematizing" represents a fourth level, in which a prototype system is installed and then continually revised and improved on the basis of feedback from its own functioning and from continuing research. Individually Prescribed Instruction as developed in the Learning R&D Center at the University of Pittsburgh is an example of this level of development. Some CAI systems are also examples. A still higher level might be called "evaluation summing," in which similar systems installed in various locations are formed into a network for exchanging and accumulating ideas, further developments, and evaluation data. A confederation and clearinghouse for teacher education programs using microteaching might be an example of this level of development.

Given this analysis, our chosen goal is the development of a model training system at the fourth level. Any further developments at the

"product stringing" level are to be regarded as components of the larger enterprise. In effect, this suggests that our program bypass the "course production" level. The "development systematizing" and "evaluation summing" levels are presumably most appropriate for R&D centers, for they require a degree of sustained scholarship and commitment best obtained in university settings.

The present program grows directly out of earlier and ongoing work during 1968-71 in the Heuristic Teaching Program of SCRDT. Many of the details of this program were laid out in the Program Plan and Budget Request submitted on October 15, 1970. They were further described in the Annual Budget Justification submitted on October 11, 1971.

The theory and evidence that indicate the program will work can be only briefly outlined here. Gage (1972, pp. 56-71) has described the ways in which theories of teaching will need to be based on analyses of teaching into component activities and performances. The ways in which such analyses are related conceptually and operationally to the micro-teaching approach have also been indicated (Gage, 1972, pp. 114-125). That the microteaching approach has worked is indicated by the evidence concerning its effectiveness (e.g., Berliner, 1969) and widespread adoption in teacher education programs (Ward, 1970). That systems of teacher education are necessary has been indicated in much of the recent literature on teacher education. This literature includes the programs developed in recent years in response to the call by the U. S. Office of Education for model elementary teacher education programs. (For a convenient summary, see Burdin and Lanzillotti, 1969.) All of those model programs incorporated provisions for improving the performance aspects of teacher education. For example, the Florida State University model provided for the formulation of performance criteria and a differentiation of practical experiences from small-scale to full-scale situations; it also required mastery of a repertoire of technical skills through very specific, graduated training experiences. The Northwest Regional Educational Laboratory model also emphasized ability to change pupil behavior in simulated or real classroom situations. The Syracuse University model featured microteaching, tutoring, simulation, and individ-

ualized instruction. The Teachers College (Columbia University) model used simulated school settings, small group situations, and feedback teams working with audio and video recordings. The University of Georgia model required that all learning activities be related to teaching behavior and based the program on the teaching act itself, with a large number of specific performance requirements. The University of Massachusetts model depended greatly on microteaching for inculcating specific skills.

A statement by two British writers (Morrison & McIntyre, 1969) summarized the general rationale by indicating that:

The complexity of the activity in a classroom at any time, and the many aspects of teaching, are such that a student beginning to learn how to teach cannot give his attention to more than a part of it; and whether observing or teaching he is likely to be overwhelmed by this complexity, to retain only very vague general impressions, and consequently to learn little. It would be desirable to reduce the situation to manageable proportions. One way of doing this is by simulating carefully planned classroom situations, with students playing various roles, and using this for a basis of analysis and discussion. A more ambitious approach, which is being increasingly used in the United States, is 'micro-teaching.'

Specifically, how will the program be carried out?

In this section, we present only a summary of the detailed means and procedures by which the program's outcomes will be achieved. In subsequent sections, more detail is furnished concerning the means and procedures for each of the program's components.

As already indicated, the program consists of eight components, each directed by the Research and Development Associates named after the title of the component. The program as a whole is monitored and supervised by the Program Director (N. L. Gage). To provide an overview, we indicate briefly here for each component the sequence of research and development to be undertaken and also the methods and techniques to be used.

Component 1. Training System Design (N. L. Gage and R. E. Snow).

In this component, the Model Teacher Training System will be designed and tried out. It will develop the programmed,\* non-programmed, and practice aspects of teacher training in systematic relation to one another.

1. Questioning, explaining, and listening skills have already been identified, formulated, and used for training in a manual-workshop procedure. The nucleus provided by that procedure will be extended as training materials from other components of the Teaching Effectiveness program are developed.

2. A Teacher Training Automat, including materials developed elsewhere, was tried out in a first version in the summer of 1971. The Automat will provide trainees with access, in an auxiliary and non-programmed form, to a wide variety of training manuals, programs, films, tapes, simulation games, tests and inventories, videotapes, and the like. The Automat will be further developed and tried out in the summer of 1972.

3. For a summary of two new activities, see pp. 11A-35 through 45.

Component 2. Assessment System Design (N. L. Gage and R. J. Shavelson). This component is aimed at evaluating the Model Teacher Training System in terms of its effects on trainees and, in turn, the students of the trainees. Results of these assessments will be used in the selection of trainees, in the placement of trainees within the individualized program, in determining the trainee's achievement of training objectives, and in providing feedback to the trainees and the developers of the system. In their initial stages, the studies of trainee selection have been based upon data from the Stanford Intern Data Bank. These data will be combined with analyses of required entry behaviors for each training activity to obtain bases for the selection-placement battery to be developed. Other data will be obtained from the tutoring laboratory, from microteaching, and from classroom practice situations. Measures of training outcomes will be obtained with tests on achievement of training objectives and tests of performance in specific situa-

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\*"Programmed" is used here to mean an organized sequence of activities, each requiring completion of the prior activity (or evidence that a criterion level has already been reached), rather than in the more narrow sense of "programmed instruction."

tional problems. The component will yield a coordinated battery of tests and situational measures. It will also yield reports on the design and study of the assessment--its validity for selection, placement, and the assessment of the effectiveness of the training system.

Component 3. Longitudinal Study of Teaching Skills (R. H. Koff).

This component will be completed as a separate activity by December 1, 1972. Its materials, procedures, and findings will then be incorporated into Component 1, Training System Design. It is aimed at providing evidence on (a) the degree to which skills acquired in preservice teacher training in the Stanford Teacher Education Program are retained after a year of training and after three years of teaching experience; and (b) which initial trainee-selection variables discriminate between teachers who remain in teaching and those who leave the profession. This component maintains the information storage and retrieval functions of the Intern Data Bank--a collection of videotapes and other information about Stanford teaching interns over a ten-year period. The data are especially abundant for the interns of 1967-68, who were videotaped at the beginning, middle, and end of their training year and again three years later. The component will yield bases for decisions in the development of the Model Teacher Training System.

Component 4. Conflict Reduction and Management Curriculum for Teachers (R. H. Koff). This component is aimed at developing materials for training school personnel in handling conflicts--ways of coping with the instability, disruption, and violence that may occur in schools. Relying especially on concepts derived from social psychology, the work of this component will use interview and questionnaire techniques for identifying conflicts in school settings. The data to be obtained from students, teachers, administrators, and community representatives will be used as a basis for a taxonomy of conflict situations. The taxonomy will be used to define the elements of a curriculum for training in conflict resolution and appropriate materials for evaluating the curriculum and training.

Component 5. Group Processes Training Curriculum Development

(R. H. Koff). This component will be completed as a separate activity by December 1, 1972. Its materials, procedures, and findings will then be incorporated into Component 1, Training System Design. In this component, materials are being developed for training teachers to work in teams with members differentiated by function. Appropriate evaluation models and techniques are also being developed. The parts of the curriculum already developed include materials for improving the skills of teachers in social perception, task and role decision making, problem solving, and group maintenance. An intensive workshop using these training materials will be conducted with experienced teachers currently working in instructional teams. The evaluation techniques will be used as part of this workshop.

Component 6. Personal Competencies Training Development (C. E.

Thoresen). This component is aimed at developing techniques and materials for training teachers to manage their own internal and external behaviors so as to optimize their effects on students' enthusiasm, divergent thinking, self-concept, and relationships with others. The training methods being developed include techniques for overt and covert self-observation and self-change, e.g., self-reinforcement and stimulus control. The relevant literature of both humanistic and behavioral psychology is being reviewed. Experiments are being conducted to assess the effect of specific self-observation and self-change techniques. The treatments include those leading to a self-observation training manual for use by teachers.

Component 7. Reinforcement Strategies Training Development (P. S.

Sears). This component is aimed at developing training procedures for improving teacher competence in furthering certain educational outcomes. These outcomes are the achievement, self-concept, and belief in internal control on the part of children from low-income areas. The first phase--a naturalistic study of six teachers and their pupils--was completed during 1969-70. The second phase--a biweekly "motivation" workshop for

a group of ten teachers and a control "science" workshop for nine teachers--was completed during 1970-71. The workshops dealt with classroom procedures for changing student behavior by improving teacher understanding of students' self-concept and of science teaching, respectively. This experience led to the design of a one-week workshop prior to the opening of school and a continuous year-long in-service training program. Phase 3, the further development and field testing of this program in one elementary school, is being carried out during the 1971-72 school year. During the 1972-73 school year, this component will produce written materials, videotapes, and manuals for leaders and participants in workshops aimed at improving the reinforcement strategies of teachers.

Component 8. Visual Media Analysis and Development (R. E. Clark). To furnish rationales, techniques, and materials for matching visual media to educational purposes, this component will develop a taxonomy of visual media. This taxonomy will be integrated with knowledge concerning individual differences among students relevant to their learning and knowledge of tasks to be learned. The component will produce a handbook, based on the taxonomy, that will assist in the selection and use of media in research on teaching, in the development of new educational technologies.

The following pages provide detailed descriptions of the components, and activities within components, which will make up the work of the program as set forth in this Basic Program Plan.

Component 1A. Training System Design:  
An Overview of a Model Teacher Training System  
(N. L. Gage and R. E. Snow)  
Expanded Description

In the decades ahead, teachers will need to be more inquiring, inventive, and adaptive to individual students than in the past. They will need to complement the instructional technology and the educational communications media increasingly being used for expository teaching. The kinds of teacher training needed to promote these teaching skills have been too little developed thus far.

The program on Teaching Effectiveness seeks to define and understand these human teaching skills, and to explore their relation to important learning outcomes. A key idea in our growing conception of teaching effectiveness is that it must adapt to the particular needs of individual learners at particular points in the learning process. Effective teaching attempts to help a learner over or around a block he faces by capitalizing on his known strengths or compensating for his weaknesses. It is often extemporaneous, arising as response to disruption or frustration of normal learning processes. It proceeds with experimental as well as helping attitudes. It is flexible for a given student and also from one student to the next.

In its earlier strategy the program analyzed teaching into component skills and developed a modeling and microteaching approach to skill training for teachers. It conducted associated psychological research on cognitive and affective interactions in the teaching-learning process.

In its current strategy, the program seeks to synthesize individual skills into coherent sequences and styles of effective teaching. This synthesis will provide the bases for the prototype of a teacher training system that combines separate skill-training procedures into an integrated program for teacher training. The system will include methods for evaluating teaching in terms of effects on learning. Thus, a major goal of the program is the development of a Model Teacher Training System.

We present here the general conception of this system as it is currently envisaged. We shall also discuss important design decisions to be faced in the work to come. Most of the system's components are still being developed. Subsequent sections in this Program Description will describe the individual components in more detail.

The system is distinctly not intended to be a comprehensive teacher education program in the conventional sense. It will be an organization of current knowledge and products useful in training effective teachers. As such, it should be useful as a component of conventional teacher education programs. The system will be integrated, self-sufficient, adaptable, prototypic, and exportable, in the following senses. The term "system" implies integrated components, each designed to serve its function and support other components. It is not simply an unorganized collection of experiences, such as microteaching model tapes or Mini-courses. As schematized in Figure 1, the system will be self-sufficient, specifying everything needed to make it work as designed; thus it will contain its own evaluation, or quality-control, mechanism. It will also be adaptable, i.e., be able to change as a function of feedback from its own evaluation mechanisms. The basic evaluation mechanism for this purpose will be a system of assessment based on learning criteria. The term "model" is used in the sense of "prototype," or "exemplar," providing a basis for further development. The system must be exportable to other sites, perhaps being modified to fit particular circumstances in each location. Hence all of it must be "written down" in the form of manuals, materials, directions, and the like. Separately, some of these parts are represented in the kinds of products already being developed in the program, but they will henceforth be regarded only as byproducts of program activity leading to the development of the training system. The major subsystems within the model will be the following:

1. Selection, diagnosis, and placement. Entering trainees will take written and performance tests designed to diagnose strengths, weaknesses, and specific training needs. On the basis of this information, the training system will be individualized in two ways: trainees will work primarily on areas of weakness, and alternative training methods

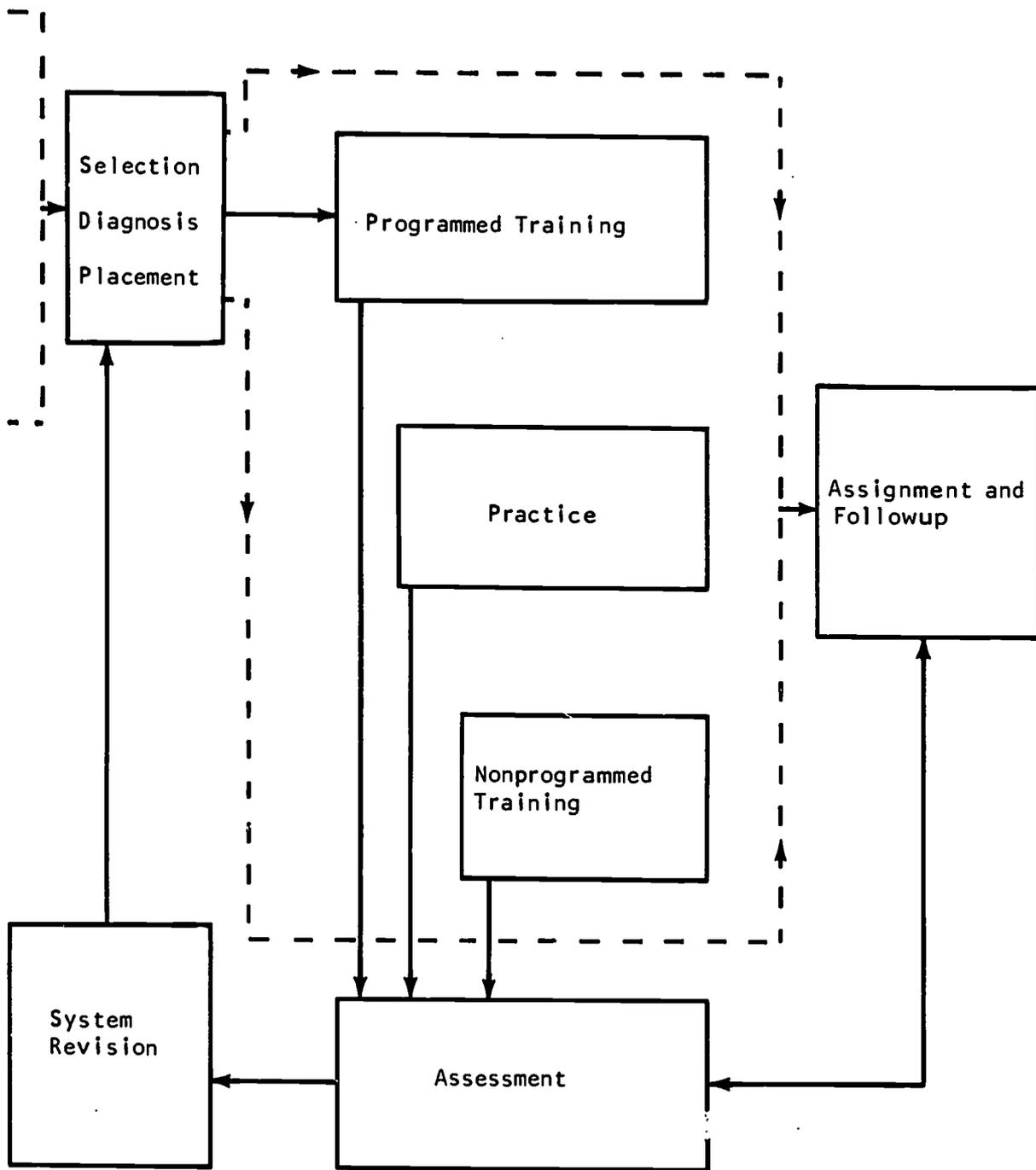


Figure 1

Schematic Representation of Model Teacher Training System  
 Showing Flow of Information (Solid Lines) and Flow of Trainees  
 (Dashed Lines) through the System

will be used with trainees of differing aptitudes. Since either prospective or experienced teachers might enter the system, a wide range of individual differences would be expected and encouraged. The placement procedure would include counseling for decisions about future specialized functions of the teacher, e.g., his role in a differentiated staff. The validity of the selection and placement devices would be studied repeatedly.

2. Programmed training. A programmed series of training experiences would be planned for each trainee. Each component would specify criterion levels to be reached. Trainees could be exempted from any component at any time by passing the test for that component, but could not proceed in the programmed series without meeting the specified criteria. This series would contain training experiences in (a) explaining, listening, questioning, and the production of reflective thinking; (b) strategies of reinforcement for achievement motivation; (c) group process skills; (d) personal competencies; (e) conflict reduction and management; and (f) the use of visual media and other technology. Some of the criteria to be reached would be specified in terms of student behavior.

3. Practice. The system would consist of intensive teaching experience in six kinds of situations: (a) laboratory training of human subjects in learning experiments, (b) simulators and simulation games, (c) role playing, (d) tutorial dialogue, (e) microteaching with small groups, and (f) teaching regular classes. Repeated trials and feedback, as in the well-established microteaching paradigm, would be the main approach to promoting skill acquisition.

4. Nonprogrammed training. Nonprogrammed training experiences would be provided for the trainees to be used at their own discretion or assigned at the suggestion of a supervising teacher working with the trainee. The facilities provided for these purposes would include (a) appropriate students available for tutoring or small-group discussion, (b) audio- and videotaping facilities for self-recording and self-observation, (c) computer-assisted instruction for the trainee's own use, and (d) a "Teacher Training Automat" containing an extensive array of teacher training films, manuals, books, tapes, etc., indexed as a library. The Automat would enable the

trainee to read about and view so-called "free" or "new" and also conventional approaches to education.

5. Assessment. Extensive data would be gathered for formative and summative evaluation through tests, trainee diaries, supervisors' reports, and analyses of tapes and transcripts. Trainees would have access to all data. A computer system would be used to store, retrieve, and analyze supervisors' observations and other data. Some situational tests using real school situations would also be used for teacher assessment. Periodically, summary judgements would be made. If the program for a prospective teacher began in June, his first regular contact with students might occur in September, and his first solo classroom responsibility in January. Data on the trainees' performance would be used to judge adequacy of training and revise the system for the following year.

6. Assignment. When the trainee had successfully completed the programmed work and practice, he would be ready for assignment. But his introduction to regular teaching duties would be gradual. He would begin by working with a teaching team and would take up some extracurricular committee and student-supervisory duties. These activities, supervised by experienced teachers, would provide on-the-job training. Further, the nonprogrammed facilities and training materials, including the Automat, would be available to him, so that he could individually pursue problems and insights as they arose. The system would also include recurring contact with each trainee during his professional life, to make possible evaluation of the system in terms of the career patterns of its products.

Target population decisions. Given the general specifications of the model system, its developers will make decisions that would govern the actual implementation of the operating system. Among these decisions are those concerning the populations for whom teacher training is intended.

Teaching roles are diverse. Teaching is done not only by teachers but by peers, parents, counselors, clergymen, and supervisors in many walks of life. Within the teaching profession, we find important differentiations by kind of institution and content of teaching, by preservice and in-service trainees, and by levels of experience. The most important differentiations may rest, not on characteristics of the teacher, but on characteristics of the student--age, sex, ethnic background, and abilities.

Finally, one might consider the years in which teachers will serve. The time lag between development of a new training system and its widespread influence is likely to be considerable. The system being developed would probably affect teachers and learners in the years 1980 to 2000, and those teachers are likely to differ from those of today in significant ways. Accordingly, the following provisional decisions have been reached regarding target populations:

1. Regular public school teachers. To begin, the model will be aimed at the training of regular public school teachers, as distinguished from teachers for private or free schools, special education programs, remedial tutoring situations, preschool educational centers, military, industrial, or social welfare agencies, or educational television production. Nonetheless, the core training experiences in the model will be aimed at the development of generalizable intellectual and interpersonal skills, potentially useful not only for teachers but for most mature learners. Ultimately, the training system might represent the general procedures of teaching and learning, useful for all human beings. But the immediate focus will be the training of public school teachers.

2. Subject-matter areas. All subject-matter areas will be served through the generalizable intellectual and interpersonal skills to be trained by the system. For this reason, it is unnecessary to choose between knowledge domains of today or the future. Although the system should provide for variation of content specialty across teacher trainees, it should emphasize no particular current specialty.

3. "Vestibule" orientation. The system should be designed primarily as a "vestibule" training experience. The concept of vestibule training is borrowed from industry, in which employees, no matter where or how educated, are given induction training to fit them for positions and functions in a particular organization. The educational professions are perhaps the only ones in our society where the receiving organizations (school systems) accept academic products without providing explicit induction training. Choosing the vestibule option does not preclude using the system in a university-based teacher education program or in continuing

in-service training. But because of the inherent flexibility of the vestibule orientation, and because it has been neglected in the past, it is here emphasized.

4. The trainees' students. The target population of students remains an open question. It is not clear that the system can serve teaching in both elementary and secondary schools or both urban and suburban schools, simultaneously. It can be argued that all teachers must and should be prepared for multicultural experiences, with each particular vestibule model adapted to the needs of its own setting. It can also be argued that age seven plus or minus one represents a transition of major importance in the psychological development of children and that the style and content of teaching must be distinctly different on each side of this period. A training system probably cannot deal with both sides, at least not at first.

Because the history and present state of our program seems to equip us best for work with learners of age seven and beyond, our training system will initially concentrate on teaching at those levels. As the system develops, it may turn out to be adaptable for preschool and primary-grade teachers, and this possibility will be explored.

Design problems. Of the design problems to be dealt with in developing the system, two pose special difficulties and deserve discussion here.

1. Domains of behavior to be included. It was stated at the outset that the Model Training System was aimed only at some categories of specific teaching skills; it was not to be regarded as a model teacher education program. Thus the system will not include work comparable to formal academic offerings in subject-matter specialties, professional education courses, or history and philosophy of education. But, beyond this, defining the boundaries of the training system is no easy matter. What other aspects of teacher preparation are to be excluded, i.e., assumed present in the trainee at entry into the system or obtainable by the trainee through other means? An adequate taxonomy of teaching behavior is not yet in hand, but at least some crude theoretical conception of teaching is needed to guide these decisions on inclusion or exclusion of specific domains of behavior.

The guiding conception used to organize the Teaching Effectiveness program's work to date has been described elsewhere (Snow, 1969). It is based on a cyclical concept of teaching such as Smith's (1960), expanded to include additional categories of cognitive activities involved in teacher-learner interaction. In earlier presentations by this program, a cycle of overt and covert events was used to identify skills needed by a teacher during interaction with a student. In Figure 2, two time cycles represented by smaller and larger circles have been included to represent a "moment-to-moment" stream and a "month-to-month" stream of teaching behavior, respectively. One can imagine a teacher engaged in interaction with a student at a given point in time. The teacher listens for cues about some confusion faced by the student, generates hypotheses as to the source of confusion, decides on a course of action deemed appropriate, and proceeds with either explaining or questioning to elicit additional cues. But the moment-to-moment behavior is also guided by a month-to-month plan. The teacher has built up experience with this student and others and has developed more or less general strategies for diagnosis, instructional management, and reinforcement. The information available in this encounter is added to prior information in a growing evaluation of the student's strengths and weaknesses. This diagnosis is used to plan instructional and reinforcement experiences suited to this particular student's needs and attitudes.

The system may eventually include components aimed at all these skill and strategy areas. In the past, the program has concentrated on the areas nearest the point of teacher-student interaction (see dashed line enclosure), but work is moving into additional areas as the training system takes shape (see dotted line enclosure). But it is unlikely that instructional management strategies will be included in the model system. This area is a broad field in itself, involving integration of instructional media and methods with curriculum development. It will likely remain in the academic domain or require a training system of its own for the preparation of specialists.

2. Adaptiveness. A key term in the conception of the training system has been "adaptive." The effective teacher adapts to differences

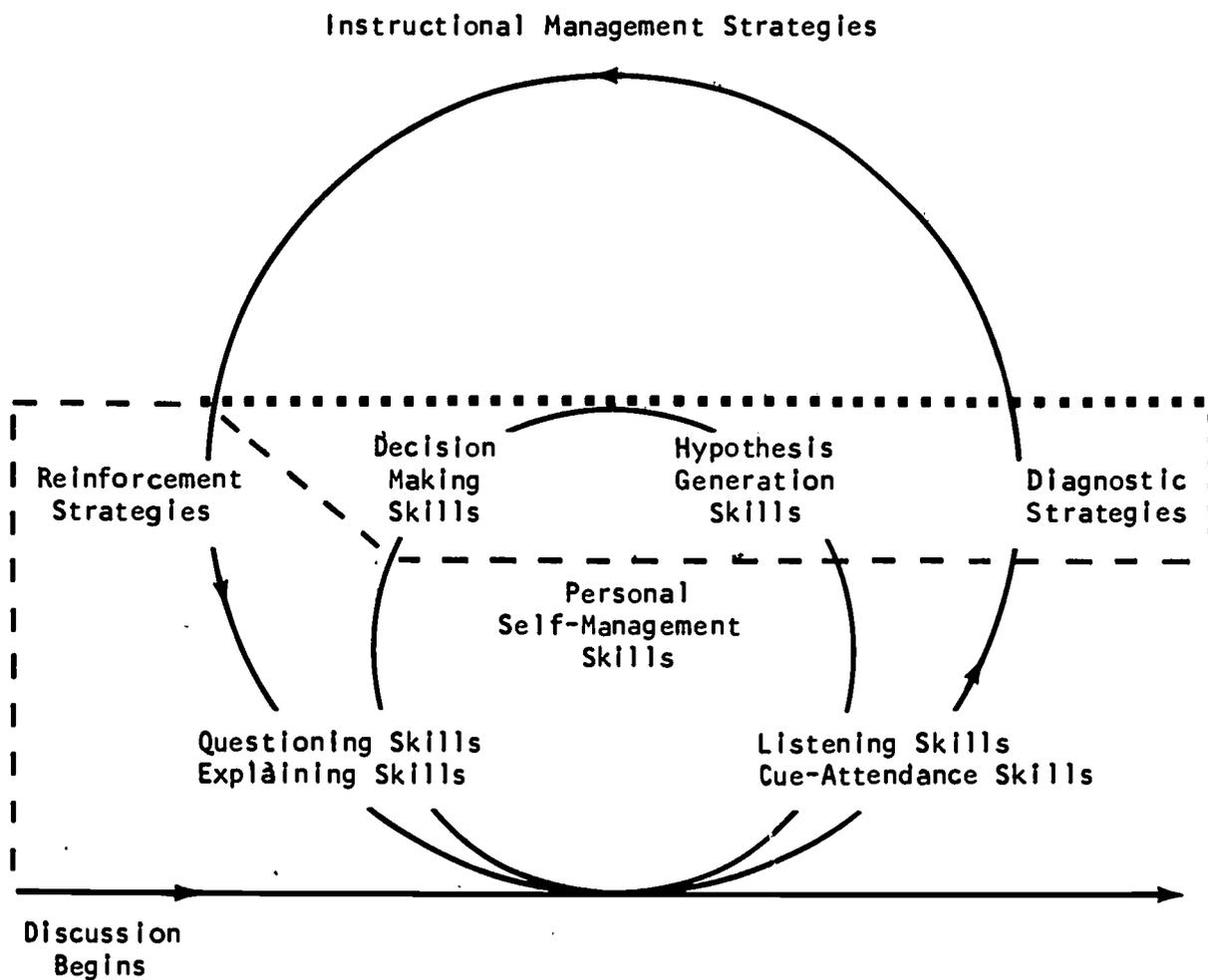


Figure 2

Temporal Course of Teacher-Student Interaction

in students. The training system must adapt to differences among teacher trainees. And the system itself must adapt to its local setting, gathering formative evaluative information about itself for use in revision.

The first two usages are fairly clear. They point to problems for the development of training experiences but pose no real difficulties for the design of the system. The third usage, however, represents a fundamental design problem. How can the system be constituted so that it adapts to its environment and to changes therein? How can the system be made evolutionary in the same sense that evolutionary computers are now being conceived?

As noted earlier, the system includes an assessment component. For now it must suffice to identify the kinds of information needed for assessment and the kinds of mechanisms needed for revision of the system on the basis of that assessment.

Figure 3 shows nine sources of information pertinent to teacher assessment or system revision. Six of these kinds of information emanate from training components in the system, and, for each of these sources, both teacher and student variables provide data for use in teacher assessment. For system revision, four other sources of evaluative information are combined with these six. These sources include statements of need by individual teachers during and after training, by school or district officials in response to changing conditions or new problems, and by a community control board. Additional sources are surveys of community views regarding current problems and studies of the career patterns of teacher trainees.

System revision then takes one of four avenues. Selection and placement procedures are periodically reviewed and revised on the basis of regular validity and reliability studies. These studies investigate not only overall validity in predicting success, but also interaction of teacher aptitude measures with performance in alternative training conditions. On the basis of these data, measures are dropped, added, or revised. The programmed training component receives similar periodic review and revision. While elements of this component are not readily dropped, since their presence in this component represents long-standing decisions on basic training needs, these elements are constantly adjusted to find

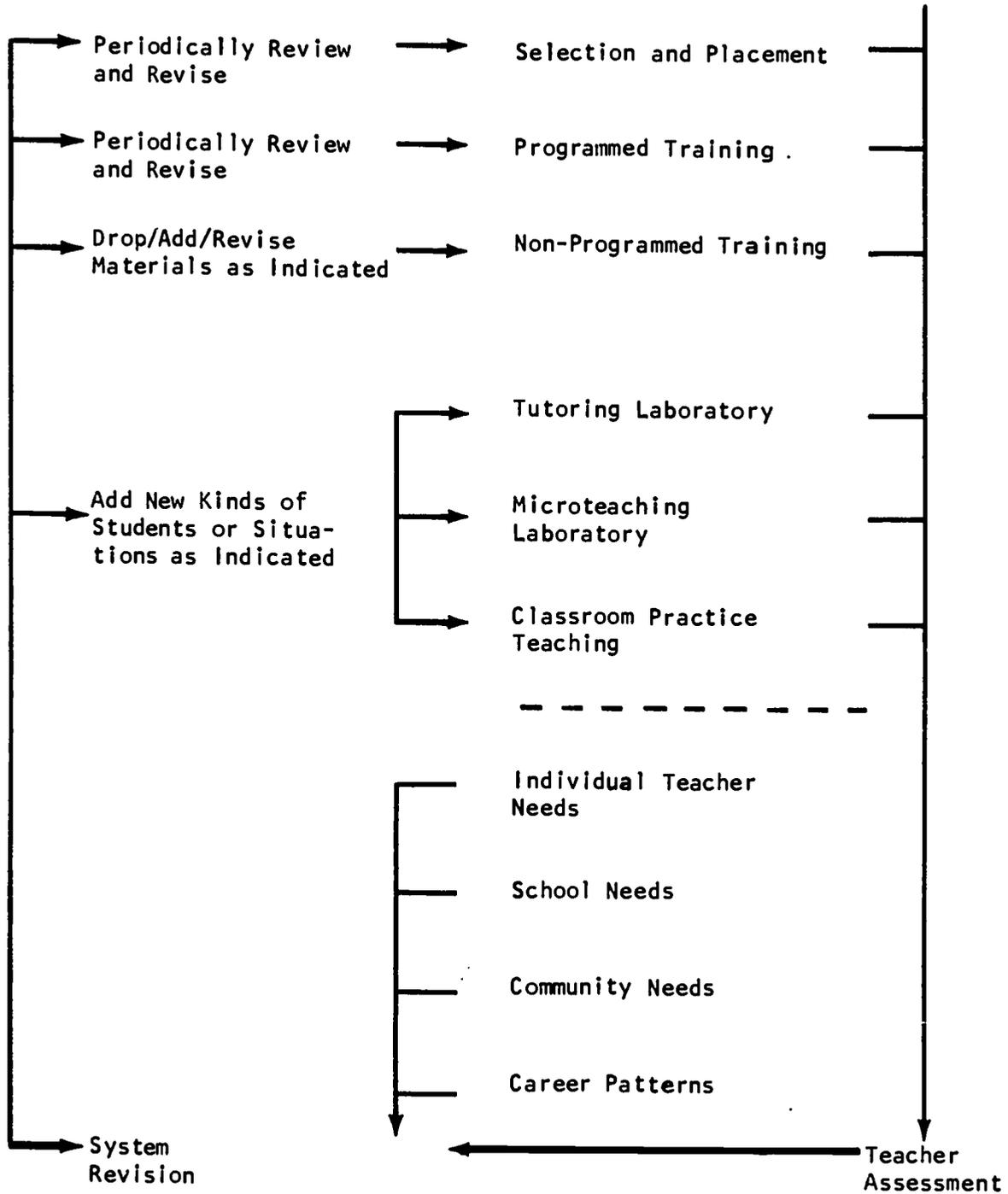


Figure 3  
Sources of Information Pertinent to  
Teacher Assessment or System Revision

optimal combinations of basic training experiences. The nonprogrammed training component is designed to be more fluid. Materials are dropped or added freely as needs and preferences indicate. Revision is rarely undertaken except when an element of this component appears generally important enough for inclusion in the programmed training component. Finally, the practice component, also conceived as relatively fluid, is revised by dropping or adding kinds of students or teaching situations as individual trainee needs dictate. Again the basic structure of practice is not modified, but its content is adapted to the needs of individual teachers, schools, and communities.

Thus, the assessment component operates continuously within the system. It serves a double function, gathering data on teacher assessment for use in trainee evaluation and assignment, while turning those and other data simultaneously to the task of system evaluation and revision.

#### Activity 1A1. Technical Skills\*

(N. L. Gage and R. J. Shavelson)

One element of the Model Teacher Training System will be designed to train teachers in questioning, explaining, and listening (QEL), and other skills, with particular reference to the use of these skills by teachers in tutoring situations.

The tutorial mode of teaching and learning is becoming more important for our Center, both as a research tool and as an end in itself. For research, the tutorial mode permits an investigator to bypass many problems inherent in the complex social situation of a classroom. Some fundamentally significant teaching and learning processes are more likely to be observable in dyadic interaction than in a setting which includes many divergent distractions.

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\*Because it is now ready to encompass additional skills, the title of this activity has been changed from Questioning-Explaining-Listening (QEL) Skills to Technical Skills.

As an end in itself, the value of the tutorial mode of instruction is being rediscovered by forward-looking teachers and educators.

The ongoing improvement of programmed and computerized instruction and other instructional media and methods suggests that, in not too many decades, many previously human teaching functions will be carried out more efficiently by other means. The teacher of the future will perform only those functions which a human can perform uniquely well. The qualities of sensitivity, flexibility, spontaneity, and responsiveness demanded in the tutorial situation mark it as the probable role of tomorrow's teacher (Snow, 1969).

#### Tutorial communication skills.

Tutoring is likely to vary widely in its purposes and procedures. No "one best method" of conducting a tutorial session can be expected. In large measure, the approach appropriate for a given situation depends on the objectives of that particular session and on the abilities, personalities, and needs of the two people involved. Yet, since all tutorial sessions are essentially extended two-way, face-to-face, interpersonal communications, there are likely to be several basic communication skills which, if developed, would increase the effectiveness of tutoring. It is suggested that three of these basic communication skills are listening, explaining, and questioning. Such skills are probably basic to teaching generally, not just to tutoring, but their function and interrelation in teaching processes may be most clearly seen in dyadic interaction.

Listening. The starting point for effective interpersonal communication is listening. If the tutor is unable to listen effectively, his responses to student questions will be inefficient, requiring repetition and rephrasing, or inappropriate altogether. Communication will be more one-way than two-way. Concentration on what the student is saying and organization of his main points mentally before responding are essential elements in effective listening. Asking for clarification, if necessary, is also an important element.

Explaining. Once effective listening has provided a summary representation of student expression, alternative tacks useful for tutor explanations can be identified. The tutor must develop skill at extemporaneous explaining adapted to the specific needs of a situation. For

maximum effectiveness, explanations provided by the tutor should be clear, complete, and valid (Swift, 1961; Thyne, 1963; Hempel, 1965; and Copi, 1968), and should avoid vague words (Hiller, et al., 1969). Two explaining techniques which may be effective are use of a rule-example-rule pattern (Rosenshine, 1968) and the inclusion of a short summary of the main points of the explanation (Copi, 1968).

Questioning. A tutor might find many types of questions useful. Questions calling for simple recall of facts, sets of related facts, and higher-order questions require the student to manipulate previously acquired information, which should lead in turn toward the development of new concepts (Gagné, 1965; Koran, 1970). The words "why," "discuss," "explain," "interpret," "evaluate," "justify," and "compare" are useful in constructing higher-order questions (Groisser, 1964). It is usually helpful for a tutor to prepare intended questions in advance and to list key words or concepts expected in an adequate answer. Once a question is asked, the tutor's task is to help the student reach acceptable answers through skillful use of cues and prompts. It is helpful to reinforce correct aspects of the student's answer and to avoid negative comments or facial expressions that might cut off student participation.

The effectiveness of any tutorial technique is measured by how well the tutor uses such skills, how well he adapts them to particular learner needs, and, ultimately, by the effects of tutoring skill on student performance. Since student reactions give valuable clues about the effectiveness of the tutor's performance, an effective tutor must become a careful observer of student behavior and an instant critic of his own behavior.

#### The tutorial skills workshop.

A tutorial skills workshop served as a first trial of the QEL system element. It consisted of a short, intensive training experience developed and pilot tested at the Stanford Center for Research and Development in Teaching in May 1971. The objective of the workshop was to help participants develop the skills of questioning, explaining, and listening in the context of a tutorial situation. Practice sessions in explaining and questioning as well as a complete practice tutorial session were included.

The workshop required approximately twelve hours to complete and was intended to be appropriate for preservice, "vestibule," and in-service applications. Each participant was supplied with a workbook, which was the central element in the workshop package. Supplementary materials included an audiotaped program for listening training, a demonstration videotape for the explaining practice session, four 16-mm films which demonstrate questioning behavior, and a cassette recorder for use by each pair of participants during the practice sessions. The sequence of events in the workshop was as follows:

Introduction	10 mins.
Listening Training	2 hrs.
Explaining Training	2 hrs.
Explaining Practice	1 hr.
Questioning Training	2 hrs.
Questioning Practice	2 hrs.
Tutorial Practice	2 hrs.

Listening. The listening training portion of the workshop consisted of audiotape programmed instruction, entitled "Effective Listening," produced by the Xerox Corporation (1963). The Effective Listening program provided the trainee with instruction, examples, and practice in the following listening skills:

- constant analysis of what is being said.
- organization of statements into main points and supporting reasons.
- outlining by use of key words.
- discrimination between relevancies and irrelevancies.
- overcoming distraction.

Although the content of most of the exercises included in this program is taken from the business world, the basic listening skills practiced are certainly relevant to educational contexts, particularly in the tutorial mode. Research at the Center by McKnight (1969) and Lundgren (1971) indicated that the Xerox Effective Listening program produced substantial gains among preservice teaching interns, when the Xerox pretests and posttests are used. It has not yet, however, been shown to affect teacher classroom behavior.

Explaining. The explaining training portion of the workshop consisted of a manual entitled "How to Explain." This manual is a modification of one developed by N. L. Gage and Robert Miltz at the Center (Miltz, 1971). The manual contains descriptive material and brief paper-and-pencil exercises which illustrate important aspects of an effective explanation. Each participant reads through the manual and performs the exercises included.

The "How to Explain" manual is organized into five lessons:

- Lesson 1 - 1. How to listen to questions.
- Lesson 2 - 2. How to pick out the main "things" in the question.
  - 3. How to determine the relationship between these things.
  - 4. How to determine the general principle involved.
- Lesson 3 - 5. How to apply the principle to the relationship.
  - 6. How to make the explanation valid.
  - 7. How to make the explanation clear.
  - 8. How to make the explanation simple.
- Lesson 4 - 9. How to focus attention on important points.
  - 10. How to use the rule-example-rule pattern.
  - 11. How to avoid vague words.
  - 12. How to summarize.
- Lesson 5 - 13. How to put the entire explaining act together and practice it as a whole.

After completing the five lessons in the "How to Explain" manual, the participants were paired in preparation for the explaining practice session. A videotape which demonstrates the procedures to be followed in the explaining practice session was shown and each pair of participants was issued a cassette tape recorder and given operating instructions. The purpose of the tape recorders was to provide the participants with accurate feedback for the critique phase of the practice session. The practice proceeded as follows:

- 1. The first participant read a provided question aloud.
- 2. The second participant responded to the question with an explanation.

3. The tape-recorded explanation was replayed and both participants criticized the explanation using an outline of the important elements of a good explanation as a guide.
4. The question and explanation were repeated in an attempt to improve upon the first explanation.
5. The entire procedure was repeated using a new question, with the roles of the participants reversed.

Questioning. The materials for the questioning portion of the workshop consisted of a manual entitled "Effective Questioning" and four supplementary 16-mm films. The manual is an adaptation of the Effective Questioning elementary-level Minicourse developed by the Far West Laboratory for Educational Research and Development (Borg, et al., 1970), and the films are part of this minicourse. The workshop participants individually read through the Effective Questioning Manual. Part One of the manual contains descriptive material and examples illustrating questions calling for a set of related facts and higher-order questions. Part Two of the manual describes and illustrates the probing techniques of prompting, seeking clarification, and refocusing. A short multiple-choice test is included at the end of each of these two chapters for the purpose of reviewing important points made in the manual.

When all participants had completed Part One of the Effective Questioning Manual, two films were shown to the group. The first film describes the skills involved in using questions calling for a set of related facts and higher-order questions. Examples of small discussion groups using these techniques are included. The second film is a protocol-format illustration of these skills. The first half of this film shows a discussion session in which the questioning skills of interest are being employed. The viewer is asked to identify the skill being illustrated at several points during the film. The second half of the film is a rerun of the same discussion session with each type of questioning skill identified by caption as it occurs.

After viewing these two films, the workshop participants moved on to Part Two of the Effective Questioning Manual. After all have finished the short test at the end of Part Two, a pair of films similar in format to those described above is shown. These films concentrate on the skills of prompting, seeking further clarification, and refocusing.

After completing the Effective Questioning Manual, two questioning practice sessions were held. The purpose of these practice sessions was to provide the participants with opportunities to actually exercise the questioning skills they had learned from the Effective Questioning Manual. The questioning practice sessions were conducted in a tutorial format with participants paired and practicing in separate rooms.

The first questioning practice session concentrated on generating questions calling for a set of related facts and higher-order questions. Different textual material was provided to each participant in a pair. Each participant generated questions which would be useful in tutoring the textual material. The first participant permitted his "student" to quickly read through the text and then led a ten-minute tutorial discussion which are tape recorded. The recording of the discussion was then played and the questions asked were criticized by both participants. The discussion was then repeated with the goal of improving the questioning skills of interest. Finally, the entire process was repeated with participants' roles reversed and new textual material.

The second questioning practice session was identical in format to the first. The questioning skills practiced in this session were prompting, seeking further clarification, and focusing. To insure that opportunities for these probing skills arose, the "student" member of the pair was instructed to occasionally respond with "I don't know" or incomplete answers to the "tutor's" questions.

Tutorial practice session. The final element of the workshop consisted of a tutorial practice session in which each participant had an opportunity to practice all of the listening, explaining, and questioning skills he had learned. The format of the tutorial practice session was similar to that of the questioning practice sessions described earlier. The textual material provided was longer and more complex than that used in the questioning practice sessions. The tutorial practice session involved approximately one hour of preparation time on the part of the participants. This preparation time was not included as part of the workshop schedule and would normally be given as a "homework" assignment.

Each participant was instructed to prepare a 15- to 20-minute lesson on the textual material provided, incorporating all of the skills described in the workshop. A detailed checklist was provided for use by the participants in evaluating the tape-recorded practice sessions. Because of time constraints, each participant delivered his tutorial practice lesson only once.

Future development.

A description and analysis of the May 1971 administration of the workshop is in preparation. Preliminary results suggest that the listening and explaining segments functioned well, but that the questioning segment will require revision. It is felt that the workshop also could be improved by changing the context of the listening training materials from a business context to an educational context.

The listening, explaining, and questioning skills which constitute the subject matter of the workshop are core communication skills vital to successful tutoring. It is recognized that these are certainly not the only important variables in a tutorial learning situation. Future development of the teacher training system will consist of efforts to improve the transfer of these three basic skills to the tutorial and other teaching situations and to incorporate additional skills into the system. At present, sections of the system dealing with reinforcement skills and problem-solving strategies are being contemplated.

Activity 1A2. Teacher Training Automat

(N. L. Gage)

The Teacher Training Automat is part of the nonprogrammed training portion of the Model Teacher Training System. It is a substantial collection of teacher training materials--films, videotapes, audiotapes, Mini-courses, manuals, books, games, curriculum materials, etc.--that appear to be useable in independent study by teacher trainees. Table 1 provides a list of some illustrative materials in the 1971 version of the Automat. Including such a collection in the Training System provides a library resource that trainees can use to meet their needs as identified by

TABLE 1

An Illustrative List of Materials Included in the  
Teacher Training Automat, 1971

<u>Type of material</u>	<u>Title</u>
Film	<u>Piaget's Developmental Theory: Classification</u> <u>How the Historian Proves a Hypothesis</u>
Filmstrip	<u>Setting Behavior Standards for the Classroom</u> <u>Privacy and Forcefulness of the Communication</u> <u>between Teachers and Students</u>
Audiotape	<u>A session in which a trainer cues students'</u> <u>learning</u> <u>Alameda-Communication-Listening</u> (Instructor gives a sentence and asks a question about the sentence. The answers to the question are given immediately.)
Curriculum material	<u>Primary Education Project</u> (A description of the training procedures of the teacher, supervising teachers, and mothers used as teacher aides.)
Guidebook and curriculum	<u>SRA Reading Laboratory</u>
Games	<u>Relationships</u> (Science concepts of cause and effect progressions in biology.) <u>Star Power</u> (Uses of power in a competitive society.) <u>Raid</u> (Power in terms of the concepts of neighborhood social organizations, etc.)

themselves or their supervisors. It also allows the preliminary tryout of training packages developed elsewhere without committing programmed system time to each one. As new teacher training products appear from other centers and laboratories, they can be introduced into the Automat. Trainees and supervisors can try these products during their routine use

of the Automat. Those that prove especially valuable can be considered for the programmed component of the training system. Those deemed redundant or of poor quality can be dropped to make way for new products.

The Automat is also conceived as a mobile automated training resource of use to trainees, new teachers, and experienced teachers alike. As presently visualized, a truck containing tutoring and/or microteaching laboratory space and equipped with video camera and recording machines, a bank of skill training videotapes, and other training materials would be located next to a school building and attached to the school's power supply. Video viewing stations connected by cable to the truck would be located in the school. Teachers would select from an index the films and tapes they wanted to view, bring selected students to the truck for tutoring or microteaching practice, with video recording, or use any of the other materials in the library through regular checkout procedures. The truck would also provide facilities for training and research activities conducted within the school. It would give the teacher access to the training system even after his completion of formal training.

At present, the Automat exists as a catalog of materials (partially listed in Table 1) and some visualizations of the mobile and viewing units provided us by a consulting design engineer. The Automat was given a pilot tryout in the summer of 1971 with 25 social studies interns in the Stanford Teacher Education Program. These interns rated each of their uses of the Automat. An R&D Memorandum is being prepared (by Joan Marks) describing progress to date. In that Memorandum, evidence is cited indicating that the Automat has considerable potential but that the 1971 version had inadequacies in degree of use by many interns; in the screening of materials for relevance, validity, and effectiveness; and in evaluation of materials by interns. Implications and suggestions for improving the Automat were derived from this first tryout.

During the coming year, the Automat will be extended. The task of identifying and reviewing training materials should be continued. The possibility of moving ahead with the mobile design should be investigated. Prior to an actual commitment on such a development, however, a mockup tryout of the automat should be conducted in space available in the new SCRDT building.

Activity 1A3. Student Aptitude as Input and Output  
(R. E. Snow)

The assessment of teachers and of the training program within the Model Teacher Training System is based on three ultimate criteria of learning outcomes for students and on intermediate criteria of student achievement and teacher behavior.

One ultimate criterion is labelled "aptitude" (see SCRDT Program Plan and Budget Request, October 15, 1970, pp. 26-27). Teacher effectiveness requires, in part, teacher behavior aimed at the diagnosis of, adaptation to, and development of student aptitude. The term "aptitude" refers to student ability to learn in new situations. It embraces traditional conceptions of general scholastic abilities and also more recently defined inquiry skills, problem-solving skills, and cognitive styles and strategies considered to facilitate learning.

To date, progress in this Center and elsewhere toward the development of measures of the aptitude criterion, or toward improved understanding of the relation of teacher behavior to student aptitude, has been slight. Suppes and her co-workers (1970) have pursued the identification of teacher behavior that promotes inquiry-related processes. Cronbach and Snow (1969) have provided an extensive review of past research on the interaction of aptitudes with instructional treatments, including teacher variables. Snow (1970) has begun an examination of the way in which teaching effectiveness requires adaptation to learner aptitude. But limitations of time and resources have forced the program on Teaching Effectiveness to concentrate during the past two years on immediate needs in the training system design.

Yet, for two reasons, the long-term success of the new training model depends on its treatment of the teacher's role in relation to student aptitude. First, effective teaching must take account, and make use, of individual differences among learners. Second, effective teaching must seek to make learners more able to learn in future situations, where the specific subject matter may be quite different and where teacher help may not be available. Formal education's most important contribution may be to equip individuals to function as independent, life-long, effective learners.

Thus, the line of research and development proposed here seeks to understand and improve the relation of teaching to student aptitude for learning. The work of this activity will contribute directly to the further development of the Model Teacher Training System. It is believed also that this emphasis on the relationship of teaching to student aptitude will clarify our understanding of effective teaching. Effective teaching for a particular student in a specific situation means helping to advance that student to a solution of the learning problem he faces. Adaptation to the learning strengths and weaknesses (i.e., the aptitudes) of students would appear to be of central importance in this process.

Three interrelated tasks will be performed in this component during the next three years beginning December 1972. These are described below.

Review and summary of literature on attempts at aptitude development.

During the current work on the Teacher Training Automat to form the non-programmed portion of the Model Teacher Training System, some materials designed to foster inquiry and problem-solving skills have been examined. A few of these materials have been obtained for inclusion in the Automat. Some of these materials seem suitable for teacher training purposes; some are primarily for use by the teacher with students. But there has been no attempt to review these efforts comprehensively or to systematize them in some form of taxonomy of aptitude development attempts. There is scattered psychological research literature on laboratory methods for training isolated abilities. There is also a long tradition of research on the origin and growth of human abilities and their organization. But teaching methods for fostering the development of inquiry and problem-solving skills have not been coordinated with the ability classifications available from this older tradition of research. A review and systematization of these methods and studies will be performed in order to examine the possibility of aptitude development as a goal for teaching and to identify teacher training and aptitude measurement techniques that should be developed in the Model Training System.

Development of techniques for the measurement of aptitude as an outcome of instruction. The assessment component of the Model Training System

requires measures of student aptitude as both input and outcome of instruction, so that the effects of teacher behavior and teacher training methods can be evaluated. The component will require observational measures of teacher and student behavior, e.g., in tutoring, and situational tests in which the student is confronted with new learning situations after receiving instruction from a teacher trainee. For the situational tests, it is expected that two or more special subject-matters can be developed to serve as a base for learning tasks for which prior knowledge can be expected to be minimal. Perhaps imaginary systems, that involve the processes of learning without reliance on prior content, can be used here. The tasks would be designed so that the learning and problem-solving processes would be partially overt, with various measures included to detect the influence of teaching skills and strategies. What we desire are indices of the degree to which, for example, learners ask themselves penetrating questions, analyze their own learning problems, or construct their own explanations more effectively as a result of experience with teachers who are more or less skilled in teaching these matters. We have been experimenting with a "teaching game," in which different kinds of learners are simulated to provide training and assessment of teacher skills. We intend also to experiment with a "learning game," in which different kinds of teachers are simulated to provide an assessment of learner aptitudes.

Constructing such measures will be difficult and uncertain. Until pilot attempts can be made and evaluated, the procedure cannot be defined with certainty. At present, the following outline seems reasonable. First, two subject-matters will be chosen or developed. With these, situational tests will be constructed and tried out in pilot work. Then they will be used in studies with the teaching and learning game approach and also as transfer tests in experiments in the tutoring laboratory. In these experiments, students would be shifted to the situational tests to assess their independent use of skills that were to have been developed by teachers in earlier tutoring situations. After such experiments, revision and further development of the assessment techniques can be planned. If the approach seems to have value at this point, the aptitude measures would be installed as parts of the assessment component of the Model Teacher

Training System, even though further development was needed. Their use in the training system would guide further development.

Research on aptitude-teacher interaction. As noted earlier, Cronbach and Snow (1969) have reviewed studies on aptitude-instructional treatment interaction (ATI). That review and examination of appropriate methodology for ATI research has recently been updated (in separate work not supported by SCRDT). Interest in the possibility of ATI seems to be increasing within the educational and psychological research community (Tyler, 1972; Glaser and Resnick, 1972), although evidence for the importance of ATI is still scanty. One area not yet explored in detail is the possibility of interactions between teacher variables and student aptitudes, though a few studies (Cleare, 1966; Heil et al., 1960; Hutchinson, 1963; McKeachie et al., 1966) hint that ATI's in this domain may be important. Thus, the third task of this activity within Component 1A will be to explore ATI hypotheses in the domain of teacher behavior.

ATI studies would be conducted primarily within the tutoring or micro-teaching laboratory of the Model Training System, but explorations in the classrooms of local schools will probably also be made. The studies would test hypotheses formulated from the Cronbach-Snow review and suggested by other work in this component, described above. As criteria, the studies would use measures of aptitude (once produced), as well as measures of specific achievement and attitude.

It is not possible now to specify what particular teacher behavior and student aptitude variables will actually be tested. These specifications will be determined in part by other constraints within the Model Training System development. During the next two years, before this ATI exploration is undertaken, the many existing ATI hypotheses will be matched with characteristics and needs of the Model Training System to define those studies most likely to be useful. The studies should provide further understanding of the effects of various kinds of teaching behavior on particular types of learners and, perhaps, rules for the selection and assignment of different types of teachers to different types of students. These possibilities cannot now be explicated.

Activity 1A4. Feedback to Teachers

(N. L. Gage and R. E. Clark)

Feedback systems provide information on which to base adaptations. Usually the adaptations are aimed at stabilizing a desirable condition or improving a less than optimal one.

The teacher uses many sources of feedback. His behavior serves as stimuli to his students, and their responses provide him with feedback as to the effects of his behavior. Thus, the teacher looks out at his class for signs of interest or boredom, asks questions of his students to find out whether they have comprehended him, is alert for signs of affection, resentment, or respect in the conversations he has with some of his students, and is acutely sensitive to anything his colleagues tell him about how his students have spoken of him. Usually, teachers acquire enough information or feedback in these ways to make the classroom process at least minimally effective. Otherwise, the classroom would be a shambles.

But there are other ways in which the teacher can get additional feedback. One way, extensively used at Stanford in the Secondary Teacher Education Program, is to use videotape recordings to allow teachers to look at and listen to themselves. Sometimes, in the process, they also receive comments and suggestions from a supervisor. Another way that has been tried at Stanford is to take 35mm time-lapse photographs of the class, every minute or so, and then look at the pictures later for signs of student attention. Sometimes, teachers invite their students to write letters or messages, signed or anonymous, concerning class procedures. Another way that has been tried occasionally is for the teacher to invite one of his colleagues to interview his students to get a frank and informal account of their feelings about the behavior of the teacher, who then gets a report from the colleague. Another approach to improving feedback has been to have an observer come into the classroom with an observation schedule for classroom interaction analysis. A report on these observations is then given to the teacher so that he can see how closely his behavior approximates his own ideal. Similarly, another method that has been tried is to provide students with pushbuttons or switches that turn

on and off to signal the teacher whether his students understand or like what he is saying or doing. Finally, teachers have been provided with ratings of their behavior by their students, sometimes along with ratings of the behavior of the ideal teacher by the same students.

The dimensions of feedback to teachers. These different sources of feedback vary on several dimensions. First, the amount of inference required of the teacher in interpreting the feedback varies. In some cases, the teacher can perceive immediately and directly what the feedback means. Thus, he does not need to be told the significance of a student's statement, "I don't know," nearly as much as he needs to be told what it means when a student seems to be staring vacantly out of the window, as shown in a 35mm slide photograph of the class.

Second, the speed of the feedback varies from the immediate to the long delayed. An example of delayed feedback is that which the teacher would receive in the form of a distribution of the ratings of one of his behaviors as to its desirability, the summary being obtained a day or a week after the students made their ratings.

The amount of preprocessing of the data in the feedback varies. Some kinds of feedback procedures can subject the data to a fair amount of statistical processing prior to the delivery of the feedback information to the teacher. Thus, it is possible to convert students' ratings into percentages, frequency distributions, means and standard deviations, by some methods of feedback. Other methods merely give the teacher raw data that he needs to process by himself in some way. An example here is the number of students who raise their hand in volunteering to answer a teacher's question.

Next, feedback can vary as to the general category of student response to which it refers--cognitive or affective. The content of the student response is of course a function of the kind of stimulus provided in eliciting the response. Cognitive questions, referring to subject matter, will give the teacher cognitive feedback. Affective questions, inquiring as to how much students like a topic or an activity, will give the teacher affective feedback. But the distinction between cognitive and affective can also be blurred. Teachers can be told that students do

not like a subject because it is too difficult intellectually, or that they are bored by an activity because it is too easy or redundant.

The relevance to teacher behavior of the feedback can also vary. Some feedback has immediate and obvious implications for teacher behavior. A student can tell a teacher that he appreciates the teacher's interest in his work and the kind of help the teacher has just given him, with the implication that the teacher ought to continue whatever he is doing for that student. Or, in a way much less immediately relevant to the teacher's behavior, the teacher can be told, by a pattern of lights on a feedback console, that the students are responding incorrectly to a multiple-choice question, but without receiving information as to how to change his explanation of the intellectual process by which the correct answer should be obtained.

Previous research on feedback. A fair amount of research and development on feedback to teachers has already been done. Some of this research has been aimed at the use of feedback in training teachers. Such research, such as that based on the use of videotape feedback in microteaching (e.g., McDonald and Allen, 1967) and Minicourses or the use of 35mm time-lapse photographs (e.g., Taylor, 1968) has already been well established in this Center.

The present component is concerned with a second kind of feedback, namely, that used in improving current teacher performance. Here, the purpose is that of giving a teacher feedback on his own students, in his own classroom, not for the sake of improving skills to be used in the future but rather for the sake of improving his immediate interaction with and effects upon students with whom he is currently involved.

One moderately well established line of research on such feedback consists of experiments on feedback of ratings from students to teachers. Gage (1972a) has briefly summarized that research, conducted by himself with colleagues and students and by research workers elsewhere. In brief, in such experiments, teachers are rated by their students on about a dozen items of teacher behavior. The students also rate their "best imaginable," or ideal, teacher on the same items. The experimental group of teachers is given information concerning the students' ratings of their actual and

ideal teacher, while the control group of teachers does not receive such feedback. After an interval of some weeks or months, the teachers are again rated by their students on the same items of behavior. The dependent variable can take such forms as the adjusted post-rating of the teachers or the discrepancy between the student's ideal and the adjusted post-rating of the teachers. In general, this research has frequently yielded findings that the feedback has a statistically significant effect on the post-ratings of the teachers by their students. That is, teachers who receive the feedback are frequently (i.e., on many items of behavior) rated somewhat more favorably by their students than are teachers who did not receive the feedback.

The theory underlying these experiments has been some form of consistency theory, such as Heider's balance theory. The previous research has also been concerned with additional variables: the interval between feedback and post-rating; the source of the feedback (e.g., students only, supervisors only, both students and supervisors, results of classroom interaction analysis); the medium of the feedback (e.g., printed or face-to-face presentation by a supervisor); the form of the feedback (e.g., median ratings only, median plus distribution of ratings); the content of the feedback (e.g., ratings of actual teacher only, ratings of ideal teacher only, ratings of both actual and ideal teacher); and various other variables.

In general, the research on feedback of ratings has suggested that it has great advantages in low cost and other aspects of feasibility and has considerable promise of providing "a reliable, reasonably valid way to help teachers improve their teaching" (Hayes, Kelm, & Neiman, 1967, p. 26).

Another major development is the use of feedback to teachers through signal systems manipulated by students. Such signal systems take the form of panels of lights of different colors switched on and off by students to indicate their choice among answers, their understanding or lack of it, their likes or dislikes, and so on. Devices of this kind have been mentioned in the literature for decades and have been marketed commercially. But reports of experiments on the effects and values of such signal systems

are, to our knowledge, unavailable. This lack should be remedied by use of the large-group instruction area of the Center's new building, which will be equipped with such a signal system for use by 80-150 students at a time.

Proposed research and development. This activity within the component on Training System Design will be aimed at further research and development on these two kinds of feedback to teachers--ratings by students and signal systems manipulated by students. These two kinds of feedback differ along many of the dimensions mentioned above. They also differ considerably in cost and feasibility for use in present-day schools.

Further research on the use of ratings by students as feedback to teachers will be aimed primarily at increasing the degree to which such feedback improves teaching effectiveness. Two major lines of investigation will be pursued: increasing the frequency of feedback of student ratings and studying individual teachers. Thus far, the experiments mentioned above have involved merely one feedback presentation. What would happen if the ratings were collected from students and presented to the teacher two, three, four, or more times during the school year? Would the effects on teacher behavior be cumulative? If so, the teachers could be expected to be coming very close to their students' ideals and preferences after several such feedbacks of student ratings.

Further, the effects of the feedback on observed teacher behavior will be investigated. Thus far, change in the teacher's behavior has been inferred primarily from the second-round ratings of his behavior by his students. Would evidence of effective feedback also be manifested in the form of ratings of that behavior by independent, trained observers? This question needs to be answered to determine whether the feedback actually influences teacher behavior.

Finally, does the change in teacher behavior resulting from the feedback improve the degree to which students achieve the cognitive and affective objectives of the teacher's work? Evidence on this matter, based on single presentations of feedback from students or on measures of student achievement with standardized tests, has been inadequate (Bryan, 1963).

Much more careful investigations of this kind of effect of the feedback are necessary; they will be made in this component.

It is anticipated that the research and development of this component will result in a package of materials and instructions for collecting and communicating ("feeding back") students' ratings of teachers, a package that has been validated as to its effect on students' ratings, observers' records of teacher behavior, and student achievement. The package will contain rating instruments for use by students, forms on which to report the ratings to the teachers, manuals of instruction for use by teachers in administering the ratings in such a way as to preserve student anonymity, and computer programs for use in rapid processing of the student rating data into a form for presentation to teachers. Also, the package of materials will contain suggestions to teachers on ways to act upon the implications of the ratings they receive from their students. The latter materials may not be available until the first (two-year) phase has been completed.

The research with individual teachers will be conducted along the lines advocated by Sidman (1960). That is, data on individual teachers will be collected and analyzed. Curves showing the frequency of various kinds of teacher behavior will be made on the basis of daily observations. Interviews and questionnaires will also be given to these individual teachers. In this way, an understanding--thus far not sought in any previous research--of the meaning and effects of the feedback of ratings of students for individual teachers will be obtained. The knowledge thus acquired will be used in the design of improved procedures for collecting and administering the feedback of ratings from students to teachers.

The work on the signal systems for feedback to teachers will be aimed at developing feasible procedures for the use of such systems. The relatively instantaneous communication from students to teachers runs the danger of overwhelming the teacher. It seems likely that teachers will lack mechanisms and procedures for using this information. Hence, it is expected that much of the developmental work will be aimed at devising adaptive mechanisms and procedures that teachers can use quickly and easily to adjust to such corrective feedback as may come to them through the signal system.

One such problem is that of making adjustments to signal information that indicates that most students are not comprehending what is being said in a lecture. The teacher has a number of alternatives in adapting to such information: He can merely say it again, more slowly, in shorter sentences, or in simpler words; he can write or draw on the blackboard. Or he can say something aimed at further diagnosis of the difficulty. Such reactions, and others that may be readily discerned, need to be systematized as classes of alternative adaptations to different kinds of feedback of signals indicating lack of comprehension by students.

Another example would be concerned with mechanisms for adapting to information indicating boredom or lack of interest on the part of students. The teacher can adapt by offering a practical application, a homely example, a humorous example, and so on. Again, the various alternative adaptations need to be systematized and codified so that teachers can learn to use them without much deliberation or hesitation and yet in a way appropriate to reducing the negative feedback.

During the first year of this activity, the work will be primarily exploratory, investigating the problems and alternatives in the use of the student-response signal systems. During the second year, an effort will be made to develop packages of manuals, forms, procedures, and training materials for improving the usefulness of such systems in optimizing teacher performance.

Component 1B. Assessment System Design

(N. L. Gage and R. J. Shavelson)

Expanded DescriptionActivity 1B1. Assessment of Teacher Performance

(N. L. Gage and R. J. Shavelson)

The state of California has a new law (Assembly Bill No. 293, Article 5.5 Evaluation and assessment of performance of certificated employees) that requires school districts to adopt procedures for the objective evaluation of teacher performance. This legislation will take effect September 1, 1972. It requires each school district of the state to develop and adopt objective evaluation and assessment guidelines that will include the following elements:

- (a) Establish standards of expected student progress in each area of study and techniques for the assessment of that progress.
- (b) Assess teacher competence as it relates to the established standards.
- (c) Assess other duties normally required to be performed by teachers as an adjunct to their regular assignments.
- (d) Establish procedures and techniques for ascertaining that the certificated teacher is maintaining proper control and is preserving a suitable learning environment.

The law requires that the evaluation and assessment of the teacher shall be reduced to writing and that a copy thereof shall be given to the teacher not later than 60 days before the end of each school year in which the evaluation takes place. The teacher shall have the right to initiate a written reaction or response to the evaluation. Such a response shall be a permanent part of the teacher's personnel file. Before the end of the school year, the teacher and the evaluator shall meet to discuss the evaluation.

The evaluation of the performance of each teacher shall be made on a continuing basis, at least once each school year for probationary teachers and at least every other year for teachers with permanent status.

The evaluation shall include recommendations, if necessary, as to areas of improvement in the performance of the teacher. If a teacher is not performing his duties in a satisfactory manner according to the standards prescribed by the governing board, the employing authority shall notify the teacher in writing of such fact and describe such unsatisfactory performance. The employing authority shall thereafter confer with the teacher and endeavor to assist him in improving his performance.

The problem. School districts throughout California are undertaking to comply with this law. But they need assistance in doing so. For example, "the Sequoia Union High School District, along with every other district in the state, has begun to wrestle with one of the most significant of the current revolutions in education, the objective evaluation of teacher performance" (Palo Alto Times, March 16, 1972.)

Because the evaluation of the teacher's performance must be related to standards of expected student progress in each area of study, it is necessary to analyze student progress in order to isolate those components of it that may properly be attributed to the teacher's performance rather than to other factors that affect student accomplishment--student scholastic ability, student home environment, school facilities, and other factors over which teachers may have no control. The isolation of those parts of student accomplishment that should be attributed to the teacher can become a complex task. Thus, the study of Equality of Educational Opportunity (Coleman et al., 1966) showed that many factors other than the teacher affected students' accomplishments and that complex statistical analyses were required to isolate the part of student accomplishment that could be attributed to the teacher. Subsequent volumes (Do teachers make a difference? A report on recent research on pupil achievement, 1970; Mosteller & Moynihan, Eds., 1972) have provided further evidence as to the complexities and difficulties involved.

The purpose of the present activity in Component 1B is to develop procedures for assisting school districts in complying with Assembly Bill No. 293. Since other school systems are confronted with similar problems, the procedures would have value extending beyond California.

The simple notion that teachers should be judged in terms of their product has great plausibility and appeal. Expertise in educational and psychological measurement and statistics--as well as curriculum, instruction, and administration--is needed to make such an assessment of teacher performance a valid and fair, as well as a feasible and plausible, enterprise. The work in this activity would be aimed at bringing such expertise to bear upon the problem.

Work on this activity will begin in the spring of 1972. A conference will be held to bring together representatives of school districts and colleges and universities, and members of the professional organizations of teachers and administrators, along with appropriate agencies of the California State Department of Education. At this conference, the nature of the task will be explored in considerable detail and plans for next steps will be made. Among the concrete problems to be considered at such a conference will be the following:

1. How should standards of expected student progress in each area be established? Should such standards refer to behavioral objectives of instruction in each area of study? Are there areas of study for which behavioral objectives are inappropriate? If so, in what other ways should standards of expected student progress be specified?

2. In what ways should factors affecting student progress other than the teacher be taken into account so as not to penalize or reward teachers unfairly? Should some kind of prediction of each student's progress be made prior to that student's entry into a given teacher's class? Then, should the teacher's performance be measured in terms of the discrepancy between the actual and predicted performance of that teacher's students? Does such a procedure violate the known mathematical and educational facts that, if such predictions are made, approximately half of the teachers will be found to be below average in terms of having students whose actual performance is below that predicted? If so, should some lower limit be set above which the discrepancy between predicted and actual student average performance should be considered acceptable? If so, what should that lower limit be?

3. Can a student's expected progress in each area of study be converted into one or a small number of indices? What should be the role of noncognitive student progress, that is, progress in emotional and social dimensions such as concepts of own worth, motivation, attitude toward school, and interest in school work?

4. What are some valid and feasible procedures and techniques for ascertaining whether the teacher is maintaining proper control and preserving a suitable learning environment? How should proper control be defined and measured? A suitable learning environment?

The adequacy of presently available theory and technique for these purposes needs to be carefully examined by theoreticians, research workers, and educational practitioners. This activity will be aimed at that examination. It is expected to result in a product in the form of suggested procedures and guidelines for consideration by each school district in its effort to comply with the law.

Review and planning conferences. The schedule for this activity would be the following:

April 1 - June 15, 1972. If preliminary investigation indicates its desirability and feasibility, a conference on compliance with Assembly Bill No. 293 will be planned. This planning will entail the selection and enlistment of suitable representatives from school districts, the State Department of Education, organizations of teachers and school administrators, regional educational laboratories, and colleges and universities. A small number of main speakers would be selected and enlisted to present papers on crucial issues.

June 15 - June 30, 1972. Hold the conference, perhaps at Stanford University. Full records would be kept of the discussions and the invited papers.

July 1 - August 1, 1972. Prepare a report on the conference containing the invited papers and edited summaries of the discussions. The final chapter of the report would contain a tentative set of suggested guidelines for school districts complying with Assembly Bill No. 293. The conference report would be mailed to every school district in California as early in August 1972 as possible.

September 1 - December 1, 1972. Analyze and assess the procedures being planned or conducted in a sample of California school districts in complying with Assembly Bill No. 293. Problems would be categorized, and solutions would be critically examined.

During the period December 26-29, 1972, a second conference would be held bringing together persons from the school districts and various other agencies of the kinds mentioned above. At this second conference, problems and possible solutions unanticipated in the first conference would be considered. Revisions of the tentative and suggested guidelines for school districts would be sought at this conference. If they emerged, they would be distributed to the school districts of the state.

January 1 - June 30, 1973. Observe and record procedures used in the first round of assessments.

July - September, 1973. Prepare report describing, analyzing, and evaluating both empirically and judgmentally the practices used and experience gained in the first round. Plan a third conference on compliance with Assembly Bill No. 293.

October - December, 1973. Conduct and prepare a report on a conference reviewing the first year and making plans for research, development, and compliance activities for the short- and long-range future.

January - June, 1974. Develop an SCRDT Manual and System on Compliance with the Teacher Performance Assessment Law.

Activity 1B2. Assessment of Teacher Training System  
(R. J. Shavelson)

The purpose of the assessment system, in broad terms, is to monitor all aspects of the Model Teacher Training System and to feed back information to allow the system to adapt to changes in training requirements. The assessment system is an integral part of the Training System and, in operation, cannot be distinguished from it.

Nevertheless, for its development, the assessment system can be distinguished from the training system and designed in coordination with it. The six major functions of the assessment system are to provide

information for decisions about (a) selection of trainees, (b) placement of trainees in the training system, (c) individual training elements, (d) alternative sequences of training elements, (e) effects of the training system on the career patterns of its trainees, and (f) overall effectiveness and efficiency of the training system in achieving its objectives.

A distinction is made between the short-term and long-term work needed to make the assessment system operational. Short-term work is that which must be done to meet the immediate information needs of the training system. Long-term work is that needed to revise and refine the short-term work. This distinction will become clear when specific functions are discussed.

#### Selection of trainees.

In making a selection decision, the administrators of the training system decide to accept some candidates for training and to reject others. This decision may be made because the training system has inadequate capacity for all applicants or because some candidates' attitudes, interests, or abilities are inappropriate for the system's goals. For example, some teachers will be trained for extemporaneous interaction with students, while others will be trained to develop curriculum for computer-assisted instruction. The training system would be more appropriate for the former than the latter.

Short-term work on selection. Short-term work on selection of in-service trainees is minimal. The recommendation is that in-service trainees be selected at random from volunteers for training, with possible exceptions based on such findings as those of recent studies by Charters (1970), Trinchero and Shavelson (1971) and Shavelson and Trinchero (1972), which indicate that (a) males tend to remain in teaching or education in general longer than females, (b) older teachers tend to remain in teaching longer than younger teachers, and (c) if a teacher has remained in teaching for four years, there is a high probability that he will remain in teaching for ten years (or more, presumably).

Long-term work on selection. In long-term work on selection, each training element is analyzed to determine the tasks the teacher is to perform, and sequences of elements are analyzed to determine the interrelation of elements. From this "job analysis," hypotheses are formed as to the characteristics of trainees that are related to success in the training system. Then instruments are analyzed, and some are chosen as possible predictors of success in the training system. Then instruments are administered to a random sample (cf. recommendation for short-term work) of candidates for training. Criterion data are then collected on the teacher as he progresses through training. These data, discussed below in detail, include measures of the trainees' effects on their students. The selection instruments are then examined for their ability to predict the criterion. This process is carried out several times, with results of each study being applied in subsequent studies.

At least one difficulty can be seen in the long-term work. During the pilot testing of the training system, the number of trainees may be too small for a prediction study. In this case, the most decisive selection studies will be carried out when the system is used in a larger program in a school district or college.

Placement of trainees.

In making a decision as to placement of a trainee within the training system, its users decide on the appropriate instructional treatment for the trainee. In an individualized training system, a simple placement decision is that on whether the trainee should enter a particular training element. If he lacks the skills provided by the element, but possesses those necessary to learn from it, he should be placed in the training element. If he possesses the skills, he should bypass the element. Further, if possible, training should be adapted to trainee aptitudes.

Short-term work in placement. The most critical placement decision for the training system is that on whether to place a trainee in a training element or to have him bypass it. To make this decision, the

degree to which the trainee possesses the skills provided by the element must be ascertained. For the short term, then, measures of the skills provided by each element must be (a) identified, (b) validated in terms of content, and (c) checked for adequate reliability. Some of these measures have already been developed. For example, placement tests in the form of pretests have been developed for the questioning, explaining, and listening training elements. They measure the trainee's performance of skills which are trained in the elements. Information from these tests can be used to decide whether a particular trainee should be placed in a particular training element. In some instances, placement tests have not been developed. An example is the Reinforcement Strategies Training Development component. In this case assessment system personnel will work closely with component personnel to develop placement test(s). Where data are available for these measures, the reliability of the instrument can be determined without further data collection.

The major task, then, is to determine whether the instruments represent an adequate sample of the skills trained by the element. This content validation work can be carried out in conjunction with the "job analysis" of the selection function. If the skills trained and the skills sampled do not correspond, instruments will be revised or developed to fit the need. The product of this work will be a set of criterion-referenced measures.

Long-term work in placement. In an individualized training system, trainees should be given training treatments that capitalize on the trainee's aptitudes. The long-term work in placement will attempt to identify trainee aptitude measures that will be useful in adapting training methods. This work, characterized as aptitude-treatment interaction research (see Activity 1A3), will seek to replicate and extend studies like those of Koran, Snow, and McDonald (1971) and Claus, Nicholson, and Snow (1972) for use within the training system. These studies have suggested that microteaching treatments might be varied to fit different kinds of trainees.

The outcome of such studies would be aptitude tests that show consistent interaction with treatments in the training system. These tests could ultimately be used for placement decisions within the system. It is likely, however, that this work will proceed slowly without first priority, since for several years the system will not include sufficient numbers of trainees or alternative training treatments to make such placement feasible. But the system must be designed ultimately to examine and take advantage of such interactions.

#### Individual training elements.

For making decisions about individual training elements, the assessment system provides a tentative answer to the question, "What changes are produced in trainees?" This is not the same as asking whether the element is effective. Outcomes of training are multi-dimensional, and a satisfactory assessment of these outcomes will map the effects along each dimension separately. The function of the assessment system is to provide detailed information on the effects of the component and to indicate where revision is desirable.

The multiple outcomes of training are specified, in general, by the training system. Projected outcomes include improvement of teaching skills in pre- and in-service teachers and, subsequently, improved effects of teaching on student achievement, problem solving, engagement, aptitude self-concept, and personal competency. Figure 1 shows the projected training system outcomes. The immediate outcomes of a training element are changes in the trainee's skills and attitudes. Intermediate outcomes are changes in student achievement (including problem-solving ability) and engagement. Ultimate outcomes are changes in students' aptitude for learning (applicational transfer and gains in aptitude), self-concept, and personal competencies.

For each of these kinds of outcome, measurement instruments must be identified or developed. The instruments will deal with process, proficiency, and attitude. Process measures have special value in providing information for element revision, since they examine the interaction of the trainee with the training curriculum. These measures

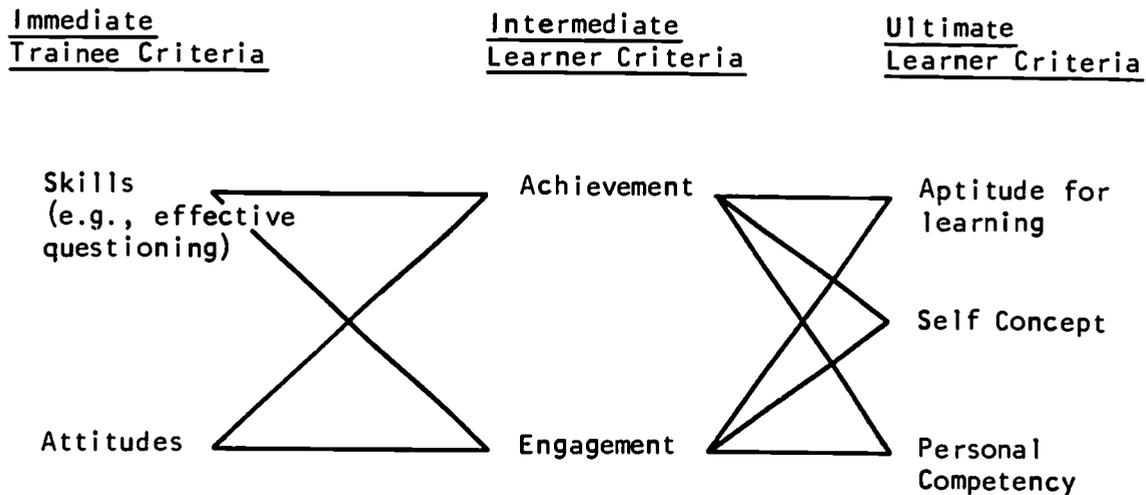


Figure 1

Relation of Trainee and Learner Variables

will use observational data (i.e., trainees will be observed interacting with the curriculum) and self-report data (e.g., trainees will keep a diary on their training experience; their written responses during interaction will be examined). Proficiency measures assess the trainees' skill in a particular teaching technique and the effect of this skill on students. Attitude measures assess the positive or negative effect associated with such attitude objects as "possession of teaching skills" or "self." Proficiency and attitude measures will be based on observations of trainee-student interaction, and on tests of knowledge, skills, and attitudes toward the skills and themselves.

The immediate outcome of any training element is a change in one or more teaching skills. To investigate skilled performance, measures and situational contexts must be carefully selected. In fact, a measurement should not be interpreted independently of the situation in which it was made. The classroom is, of course, one situation that will be used to investigate a trainee's performance. But the classroom may be too complex and too far removed from original training to permit sensitive measurement of a specific skilled performance. A second

situational context for assessment, then, is the microteaching laboratory, as mentioned above. Skills that must be observed over longer periods of time, with fairly complex instruction, and a trainee-student dyad, can be studied in a third situational context, the tutorial laboratory. In this laboratory, trainee-student dyads are observed intensively over relatively long periods; the trainee's teaching performance and the student's cognitive structure are continually monitored.

So far the discussion has focused on feedback of information to training system designers. The assessment system also has the function of providing immediate knowledge of testing results to trainees and students. Accordingly, in the development of the data management system, provisions must be made for reporting test results to (a) system designers, (b) trainees, and (c) students. A careful analysis of information requirements must be made, since these audiences require different information.

Short-term work on assessment of individual elements. For each element of the training system, the goal of short-term work is to provide at least one measure of (a) immediate criteria (trainee's skill performance and, perhaps, process and attitude), (b) intermediate criteria (student achievement and, perhaps, engagement), and (c) ultimate criteria (student aptitude for learning, self-concept, or personal competency). The situational context for the posttest will be determined by training and measurement objectives. Measures for assessing programmed elements will be given priority over those for nonprogrammed elements. Finally, a first approximation of the data-management and feedback system will be developed. Particular care will be taken in determining feedback media (supervisors, videotape recordings, test scores) for trainees.

The short-term work can be illustrated in the recent investigations of the reliability and validity of observational and self-report measures of self-concept. These investigations have led to the recommendation of several self-concept measures of academic and nonacademic self-concept for the assessment system. But the recommendation

also included a detailed outline for long-term work since an extensive search of the literature showed a lack of adequate validation studies.

Long-term work on assessment of individual elements. For each programmed element of the training system, the goal of long-term work is to provide measures of immediate, intermediate, and ultimate criteria. These measures will be available for assessing the effect of each element in any situational context. For each measure, a generalizability study will be performed. If constructs such as self-concept are involved, construct-validation studies will be performed.

For each nonprogrammed training element, the goal of long-term assessment work is to provide at least one measure of an immediate criterion. And where appropriate, at least one measure of an intermediate and an ultimate criterion will be provided. The situational context will be determined by the nature of the nonprogrammed training element.

Finally, the first version of the data-management and feedback system (developed as part of the short-term work) will be developed into an elaborate, efficient system. For example, self-report test data on trainee attitude and on student attitude, achievement, and self-concept will be fed directly to the computer for analysis. Provisions will be made for rating and scoring observational data, which will also be fed to the computer for analysis. With the aid of generalizability studies of observational schedules, the number of variables to be rated, and the time lag between data collection and data analysis, will be reduced. For each measure, data will be printed out separately, with self-contained interpretations, for training system designers, trainees, and students.

Sequences of programmed training elements.

In the previous section, assessment of individual training element outcomes was examined. In this section, assessment of outcomes of sequences of programmed training elements is examined. With this function, the assessment system provides information to training system decision-makers on the effectiveness and efficiency of specific sequences as measured by trainee and student outcomes. More specifically, this function complements the placement function in investigating the match between sequence of programmed training elements and the trainee's aptitudes.

Short-term work on sequences of training elements. Alternative sequences and sequences of training elements will be identified. For example, alternative sequences can be identified for the programmed training sequences on questioning, explaining, and listening. Trainee aptitude data (see Placement of Trainees) and data on outcomes (see Individual Training Elements) will be collected. Then these data will be examined for aptitude-treatment interactions for each outcome measure.

Long-term work on sequences of training elements. One aspect of long-term work is the revision of placement and sequence functions using the results of the short-term work on sequence. A second aspect is the construction of a decision-making model. This model would take into account multiple trainee-aptitude and multiple training-element outcomes and would provide decision rules for revision of training sequences and placement of trainees into training sequences. It could be built into the data-management and feedback system.

Career patterns of trainees.

The purposes of work on the career patterns of trainees are to provide information on (a) general career patterns of trainees, (b) stability and change in teaching skills after training, and (c) criteria used in selecting trainees.

Short-term work on career patterns. The survey and data analysis techniques developed in recent studies of factors influencing the career patterns of teachers (Charters, 1970; Shavelson & Trinchero, 1972; Trinchero & Shavelson, 1971; Whitener, 1965), will be used in the design of the career-pattern survey and analysis of data. The short-term tasks are to build a career-pattern survey and to design a procedure for collecting data on trainees' teaching performance after training. The assessment system provides the outcome measures and situational context for data collection. The task is thus to design a plan which would specify the sampling of (a) trainees, (b) teaching skills, and (c) times of testing, i.e., the months or years after training.

Long-term work on career patterns. Long-term work would be aimed at the incorporation of career-pattern and technical-skill data into the data-management and feedback system and the revision of selection procedures on the basis of analyses of these data.

Overall training system effectiveness.

As indicated above, the functions of the assessment system are to provide detailed feedback to training system decision makers, trainees, and students. In this sense, the assessment system provides formative evaluation of the teaching-training system. The assessment system also provides summary feedback on the extent to which the training system has achieved its terminal objectives. In this sense, the assessment system provides summative evaluation to decision makers in the program, the Center, and the federal government. This latter purpose is achieved by presenting information on the overall effectiveness and efficiency of the training system.

Component 1C. Longitudinal Study of Teaching Skills  
(R. H. Koff)

As of December 1, 1972, the products of this component will be incorporated into Component 1A: Training System Design, and it will cease to function as a separate component.

The Career Patterns study, which has been an activity of this component, has thus far yielded reports on the careers of graduates of the Stanford Secondary Teacher Education Program (Trincherro & Shavelson, 1971), the prediction of these career patterns (Shavelson & Trincherro, 1972), and the attitudinal correlates of short-range longevity in teaching (Krasno, 1970).

The Data Bank which was an integral element of this component will continue to function, but under the direction of the Center's Methodology and Media Units. The Data Bank Manual now being completed describes in detail the information stored in the Data Bank concerning Stanford Secondary Teacher Education Program graduates from 1959 to 1969. The Methodology Unit will continue to provide data from the Bank and conduct analyses of data as appropriate. The Media Unit will continue the classification of videotapes obtained from Teacher Education Program students and will make the videotapes available for research purposes. Eventually, the Data Bank will allow a research worker to request the videotape of a teacher who meets particular specifications, e.g., one who is still in the classroom, is teaching a racially mixed class, is using a discussion format, is teaching a social studies lesson, or whose Graduate Record Examination scores are at the 95th percentile.

Component 1D. A Conflict Reduction and Management  
Curriculum for Teachers  
(R. H. Koff)  
Expanded Description

The problem.

Within the American system of public precollege education, two trends seem to be of particular importance. The first is an effort to redefine the role of the teacher in order to better meet the actual needs of students. The second is the increasing incidence of school disruptions--events that significantly interrupt the education of students (Bailey, 1970). Both of these trends have profound implications for education, but to date they have been examined mainly in separation from each other.

The first of these trends stems from significant changes in our society over the last decade. Many students graduating from high school today cannot find jobs (U. S. Department of Labor Report, 1969). In many instances, they are severely undertrained in the uses of knowledge for which they have the greatest aptitudes (Elam & McLure, Eds., 1967). In addition, significant numbers of students fail to attend classes or indicate that they are "turned off" by required courses and dress codes (Birmingham, 1967). Schools have also received increased critical attention from the media and other sources. They are described by C. Silberman (1970) as "grim and joyless institutions." Schools motivate students through a system based on fear (Holt, 1968). Current educational practices punish creativity and independence (Kohl, 1969), induce alienation (Haskings, 1969), and should, as a consequence, be abolished (Schoolboys of Barbiana, 1971). These critics have had a profound impact on American education because they have, despite their often fragmented approach, strengthened a sense of pain and folly at the alleged lethargy and mindlessness of current educational practice. These authors and educational researchers (Snyder, 1971; Jackson, 1968; Smith & Keith, 1971) have also questioned the assumption that what is currently happening in schools needs to continue.

Efforts to redirect and restructure the educational process, and teaching in particular, toward the actual needs of students are reflected in the development of numerous programs of individualized instruction. Their intent is to promote the functionally unique human characteristics of the teacher that distinguish him from the educational establishment, the textbooks, and the machines. Individualized instruction restructures the teacher's role so that the teacher will spend his time on the things he can do best, such as helping the student to initiate inquiry, to gain a favorable image of himself as a learner, and to acquire the skills of effective participation with others (Hilgard, 1968).

The second trend, the increasing incidence of school disruptions, is a contemporary phenomenon becoming more and more serious. In an increasing number of communities, white students and minority students, minority students and white educators, or white students and educators have engaged in disruptive, sometimes violent, and often unresolved forms of social conflict. The Lemberg Center for the Study of Violence (Brandeis University) reported that, in the first four months of 1968, 44 percent of all recorded (civil) disorders involved schools and that this represented a three-fold increase over the entire year of 1967 (Riot Data Review, 1968). In a recent study completed by Bailey (1970), 27 secondary schools from 19 cities involving a total of 60,000 students were examined. The results showed that 85 percent of the schools indicated some form of major disruption during the last three years. A study by Trump and Hunt (1969) for the National Association of Secondary School Principals showed that 60 percent of high school principals sampled reported some form of active protest in their school; many of those who noted no protest indicated they expected it in the near future. A report of the results, in Education U. S. A. ("Serious Protest . . .", 1970) of the survey by the House Subcommittee on General Education on student activism and disruption revealed that of the 29,000 public secondary schools sampled across the United States, 18 percent of the respondents had experienced "serious protest."

The evidence of disruption within the educational system is compelling and has resulted in significant efforts to combat it. Unfortunately, it appears that most efforts have led to increasing the number

of security guards in schools, an increase in the need for and greater dependence on guidance counselors and paraprofessionals, and suppression of student underground newspapers and student attempts to establish self-governance procedures (Birmingham, 1970; Chesler & BenDor, 1968; Adams, 1968). Those students who practice the art of "intelligent rebellion" (Redl, 1955), as well as those who are genuine discipline problems, appear to be treated as though they are one and the same (Stinchcombe, 1964). Those who disrupt the status quo or who represent academic failures have needs which are simply not being met by teachers. Nowhere is this more evident than in inner-city schools, where concern for minority students should be most apparent, but where there is a seeming lack of concern among teachers and professional teacher organizations for what happens to students after their first academic failure (C. Silberman, 1970). Students, it is charged, are left on their own to cope with the psychological effects and sanctions that follow rebellion and academic failure (Keach, Fulton, & Gardner, 1967).

Unfortunately, even where violent disturbances have not occurred in schools, serious alienation from learning and mutual distrust between students and teachers has characterized interracial and intergenerational contact and interaction (Chesler & BenDor, 1968; Slater, 1971). One of the most distressing products of disturbance and violence is that nothing of any educative value can be accomplished under such conditions. The resulting administrative responses of using repressive controls, expelling students, or surrendering to chaos, represent examples of inability to resolve conflicts productively. Often schools are patched up sufficiently to delay problems or drive them underground--a strategy likely to create disruption and violence later.

Strategies which prevent the expression of real concerns and the exploration of important issues serve to reinforce students' feelings of being overcontrolled (Wittes, 1970). Many students perceive administrative authority, in teachers in particular, as restrictive and undemocratic. Teachers are not viewed as being interested in individual students; as seen by students, they count only student achievement and could not care less about its inner meaning or its cost to student

personality. Furthermore, the school organization, it is charged, facilitates the development of a role for teachers and administrators as keepers of law and order (Birmingham, 1970; Hendrick & Jones, 1972). As a consequence, students perceive these authority figures as caretakers rather than as educators, as people who generate mixed messages and hidden curricula, and student resistance to them increases (Stinchcombe, 1964; M. Silberman, 1971; Snyder, 1971).

Approach followed by this component.

A productive and educational perspective for educators is that the situation is not hopeless, and that some educationally fruitful means for diagnosing, managing, rebuilding from, or responding to conflict in schools may exist. The purpose of this component is to explore one particular possible approach to conflict reduction and management in the schools.

It is clear that there are numerous causes for school disruption and that, given the broad range of motivations operating in the lives of students, it is particularly difficult to generalize about them. The patent failure of existing efforts to solve the crisis in the schools continues to be an unsolved problem of increasing national concern. While it is related to a complexity of societal factors, it represents a failure of human service professionals as well. As the extent and violence of school disruption have become more evident, it has become clear that the problem will not be solved by simply increasing the number of policemen, tinkering with administrative organization, nor reducing class size. Any effort at solution must reconsider the roles of teachers, the institutions in which they work, and their relationship to the local community.

In this component we have chosen to work with teachers. Our concern is with improving teacher ability to meet the actual needs of students. Students charge that teachers are caretakers rather than educators, people who generate mixed messages and hidden curricula. Many teachers feel that they have only a vague notion of the way teaching is or ought to be. As a result, they are highly susceptible to the development of role conflict. The conflict reduction and management curriculum

will be designed to train teachers to become aware of their feelings of role conflict and the mixed messages they give to students as one way of helping reduce what are felt to be significant contributors to school disruption. The strategy of the research effort is to identify symptoms of impending crisis--specific behaviors which are thought to be predictive of school disruption. Once symptoms have been identified, a curriculum for training teachers to identify and eliminate the causes of such behavior will be developed.

The component's efforts are expected to provide a comprehensive collation of information not now available on the ways in which teachers can examine and deal with conflict in the schools, and to provide a training curriculum that can be utilized in preservice and continuing education programs. The research program is specifically aimed at improving understanding of the interplay between efforts to redirect and restructure the role of the teacher toward the actual needs of students and the incidence of school disruption and violence, by explicitly examining two variables thought to be related to symptoms of crisis--teacher role conflict, and mixed messages.

Teacher role conflicts are examined within the Getzels and Guba (1957) framework, which bears upon the origin of individual and institutional conflict. In their formulation, the social system in which individuals live and work can be divided into two major classes of phenomena: the institutions, in this case the school (nomothetic dimension), and the individuals inhabiting the system (idiographic dimension). Incongruence between (or within) these two dimensions leads to a loss of both institutional and individual productivity and generates role conflicts.

The role of the teacher is largely defined by the nomothetic dimension, yet it is quite clear that a number of power groups attempt to define expectations for teacher behavior. One kind of role conflict is generated when more than one reference group defines the role of teacher--thus creating contradictory expectations for teacher behavior. In addition, teachers have idiographic needs and dispositions which at times come into conflict with one another, as well as with expectations defined by the nomothetic forces. For example, it is the students to whom the teacher is directly responsible, and the students also have opinions

concerning what the teacher's role should be. When a national sample of high school seniors and graduates were asked to rate their teachers (Sabine, 1971), the characteristics mentioned most often as typical of the best teacher were "demanding" and "caring." Many students thus rated highly those teachers who were strict and forced them "to do the most work"--characteristics which radical school reformers want teachers to abandon, but which minority-group parents want teachers to retain. Some students likened their best teacher to a "second mother" or someone who is always willing to give up her free time to talk to the student about his problems; others regarded their worst teacher as one who "tried to be a pal instead of a teacher." The teacher who is concerned with conforming to the demands of the student world is, it would appear, faced with conflicting expectations.

Mixed messages represent a category of behaviors which frustrate teachers as well as students. Mixed messages serve to build inconsistency and distrust. They are message-behaviors characterized by their contradictory content--they thwart the efforts of students to gain the information necessary to make decisions about what action they can take to gain a desirable outcome. In addition, mixed messages represent a phenomenon which we postulate constitutes an "invisible curriculum" (Koff & Warren, 1968)--the overwhelming, nonproductive mass of unstated academic and social norms that diverts the student from creative intellectual effort and successful interpersonal relationships. This curriculum is maintained by teachers as well as students, and represents to a significant degree what becomes the basis for all participants' sense of worth and self-esteem (Snyder, 1971). It is this hidden curriculum, more than the formal curriculum, that influences the range of student and teacher adaption to the impact of school and their defense against anxiety.

It should be stressed that what is crucial about mixed messages is not the presence of formal rules and informal responses, but rather the kinds of dissonance that are created by the distance between the two; the way that students and teachers work out, clarify, and discuss the conflicts and issues that are often concealed. At the moment, there is

little recognition in the secondary schools that mixed messages are being generated by teachers and students and also little recognition, if any, of the conflicts and issues surrounding them.

An example of a mixed message concerns what it is that teachers expect of students as opposed to what is formally required of them. The teacher may explain at the beginning of a semester that he requires knowledge, competence, creativity, and originality. In many cases, the teacher may mean and believe what he has said, but he may then set tasks in such a way that rote memory only is rewarded. It takes the student a little time to sort out these messages, to locate the disparity, to interpret the mixed signals created by the presence of both a formal and a hidden curriculum.

What students will do in response to stress generated by mixed messages will differ for each individual, though all develop adaptive techniques in order to deal with the confusing characteristics that confront them. Some students strike out in anger, while others withdraw. Some can live with teacher favoritism, preserve their individuality in a crowded and impersonal classroom, adjust to frequent personal evaluation, and accept the pervasive authority of teachers and school administrators; others cannot. Coping with demands like these leaves many students confused, afraid, and resentful. These feelings represent the ingredients for potential disruption and violence.

Specific aims of the research and development program.

The specific aims of this component are:

1. To review the literature.
2. To define and operationalize critical variables thought to be related to school disruption.
3. To explore the ways in which teachers can redefine their roles so as to meet student needs more effectively and thereby reduce teacher behavior hypothesized to be related to student disruption and violence.
4. To test in the field, with teachers and students, the validity of the variables so identified.

5. To develop a conflict reduction and management training curriculum for teachers that can be used in preservice and in-service teacher education programs.
6. To evaluate the effect of the conflict reduction and management training curriculum in terms of its ability to bring about desired changes in teacher behavior.

The inquiry is designed to take place in four phases, culminating in the development of a conflict reduction and management curriculum for teachers.

1. Reviewing the literature. The first phase, already substantially completed, calls for a review of the literature on school disruption and teacher role definition. The purpose of the review is to provide a basis for the curriculum development effort.

2. Operationalizing critical variables. The next step is to develop instrumentation that operationalizes the variables identified in the first phase. This activity will assess the validity of the theoretical formulations against external reality--students and teachers in the school situation. Currently, two instruments are being developed, one to define role conflict, the other to define mixed messages. The first instrument, to be administered to teachers, is tentatively entitled "Thinking about Myself as a Teacher." The second instrument, to be administered to students, is tentatively entitled "Thinking about My Teacher." Each instrument has statements which require each respondent to make two responses to the same statement. For example:

Item: A person who lets students know where he stands on issues

a. Teacher response:

- |   |     |     |    |    |
|---|-----|-----|----|----|
| 1. Are you like this teacher?           | YES | yes | no | NO |
| 2. Do you want to be like this teacher? | YES | yes | no | NO |

b. Student response:

- |   |     |     |    |    |
|---|-----|-----|----|----|
| 1. Is your teacher like this person?                | YES | yes | no | NO |
| 2. Do you want your teacher to be like this person? | YES | yes | no | NO |

Subscales that relate to different types of role conflict and mixed messages (e.g., teacher-pupil interaction, teacher personal characteristics, and so on) are being developed for each instrument. For example, in the first section of the teacher's instrument, teachers will have statements in which they are asked to indicate whether they are like the individual described. In the second section of the instrument they are to indicate whether they want to be like the individual described. Discrepancy scores will be computed on the basis of the differences between responses to the first and second sections. It is hypothesized that the greater the discrepancy score, the greater the role conflict and the frequency of teacher-generated mixed messages. Due regard will be given to the importance of testing hypotheses about monadic variables before dyadic variables are considered to be validated (Cronbach, 1958).

3. Developing the conflict reduction and management training curriculum for teachers. The third phase of the work calls for the incorporation of the information obtained in the first two phases into the development of a conflict reduction and management training curriculum for teachers. The curriculum will be divided into at least four modules, each having a statement of purpose, protocol features, and training objectives. The modules will be concerned with identification, observation, and intervention strategies for teachers to use in reducing the hypothesized causes of conflict (role conflict and mixed messages). It is intended that when teachers complete the training sequence, they will be able to:
- a. Identify sources of role conflict.
  - b. Use a variety of strategies to reduce role conflict.
  - c. Identify mixed messages and their impact on student behavior.
  - d. Identify mixed messages originated by themselves or by students.
  - e. Use a variety of strategies for reducing their own mixed messages.
  - f. Use a variety of strategies for talking to students about the impact of mixed messages and what can be done about them.

4. Evaluating the curriculum. The fourth phase is concerned with the evaluation of the effectiveness of the curriculum in attaining its stated purposes. It is anticipated that this stage will involve at least two field tests of the curriculum with experienced and inexperienced teachers, including extensive observation in the field to attempt to assess the effects of the training on student behavior.

Phases 3 and 4 of the research and development program are scheduled for FY1973.

Reports.

The results of Phases 1 and 2 of this study will be summarized in two reports. Phase 1 will be completed by June 1972; Phase 2, by September 1972. A preliminary draft of the training curriculum with associated protocol features and objectives divided into modules will be completed by November 1972. Revision of the curriculum after the first field test and appropriate evaluation instrumentation is scheduled for completion by the end of March 1973. The first field test of the curriculum and first revisions are scheduled for completion by August 1973.

Component 1E. Group Process Training Curriculum Development

(R. H. Koff)

As of December 1, 1972, the work of this component will be incorporated into Component 1A: Training System Design, and it will cease to function as a separate component. The major product of this component, the Group Process Training Curriculum, will be incorporated into the Model Teacher Training System and will also be made available to various organizations, such as regional educational laboratories, for further development.

Component 1F. Personal Competencies Training Development

(C. E. Thoresen)

Expanded Description

The problem this component addresses is that of improving teachers' skill in managing their own internal and external behaviors, and, as a result, teachers' effects on the internal and external behaviors of students. In general, this component operates on the assumption that present-day teachers are not competent enough in this kind of self-management and that, consequently, their students are too often confronted with teachers who create rather than solve problems in school learning and teacher-student relationships. The failure of American teachers to realize the potential of effective teaching, outlined earlier in this Program Description, can be attributed in large part to their inadequacies in managing their overt and covert responses.

"Overt responses" refers to those actions of the teacher that are directly observable by others, i.e., audible and visible responses, verbal or nonverbal. Examples are hand gestures, tone of voice, intonation, loudness, types of words used, and positive or negative feeling tones. "Covert responses" refers to "thoughts," i.e., internal sentences, words used in talking to oneself, auditory and visual images, and physiological responses. These two kinds of responses bear upon the teacher's effectiveness because they influence the behavior of students. Evidence that teachers are not adequately competent in these respects is available from the abundant testimony of popular writers and journalists. Silberman (1969) referred to joylessness in American education. Smith (1969) held that teacher education has almost totally failed in developing the competencies of teachers as persons. The recently formulated model elementary teacher education programs (see Burdin and Lanzillotti, 1969) refer repeatedly to the importance of such competencies and the inadequacies of American teachers in these respects.

General strategies.

These problems have not lacked attention in teacher education programs and in research and development on teacher education. But the approaches being used elsewhere are based primarily on traditional

counseling approaches, quasi-psychotherapeutic orientations, or group-dynamics and sensitivity-training approaches. In some approaches, it seems to be assumed that individual psychological testing will provide a fruitful avenue toward the improvement of teachers' personal competencies.

This component of the program on Teaching Effectiveness brings social learning and behavioral strategies to bear on this general problem area. Part of the justification of the present component rests on the success of this general theoretical orientation in changing human behavior of many kinds (Bandura, 1969, 1971).

The second major basis for the rationale for the present component is the work of the humanistic psychologists (Maslow, 1966; Buhler, 1971). These writers, exemplified in the field of education by Brown (1971) and Weinstein and Fantini (1970), have formulated curriculum strategies that emphasize the affective and social objectives of education. Further, they have attempted to develop teacher education programs that emphasize the development of the teacher "as a person," especially in his affective and emotional dimensions.

This component's work along these lines has been aimed at developing a theoretical rationale for personal competence. This rationale is designed to bring together the problems and orientations of the humanistic psychologists and educators, on the one hand, and the approaches of behavioral psychologists to the modification of human behavior, on the other. This synthesis, which we have called "behavioral humanism" (Thoresen, in press), is being directed at the problems of teachers and their students. This work is unique in applying to the objectives of humanistic psychologists the rigorous and empirically grounded approaches of behavioral scientists, especially those working with social learning theory and behavior modification techniques. Humanistic educators for the most part have not based their work on empirical research. Reliable observation of individual performances, systematic gathering of data, careful manipulation of independent variables--all these have been absent from the work of most humanistic psychologists (Buhler, 1971). The present component is aimed, in large part, at remedying these deficiencies.

A major aspect of the research strategy being employed in this component is the intensive study and analysis of the behavior of single individuals. As against the traditional group-data approaches typically used in educational and psychological research, Component 1F is making considerable use of experimental analysis of the behavior of single teachers and students (Sidman, 1960; Shontz, 1965; Chassan, 1967; Thoresen, 1969, 1972).

Since 1969, when work in this component began, extensive reviews of the humanistic and behavioral literature have been made. The outcome of this work will be published as "Behavioral Humanism" (to appear as an SCRDT R&D Memorandum now in process, and also as a chapter in the 1973 Yearbook of the National Society for the Study of Education, Behavior Modification in Education, being edited by C. E. Thoresen). Current and proposed models of teacher education have been analyzed in terms of the theoretical orientation of this component. These analyses, to be entitled "The Personal Competence of Teachers" (SCRDT R&D Memorandum to appear in late 1972), deal with teacher education program formulations of recent years, their inadequacies, and their promising elements, with the goal of developing more effective teacher behaviors. Among the teacher education programs considered are those of the humanistic psychologists (e.g., Brown, 1971); the Northwest Regional Educational Laboratory consortium on elementary education; and the University of Massachusetts (Burdin and Lanzillotti, 1969).

Previous work in this component.

This component since 1969 has undertaken several experimental studies. These studies have dealt with the assessment of imagery behavior, the modification of imagery responses, the use of anxiety management techniques with elementary school teachers, the use of social modeling to increase the frequency of positive verbal responses by teachers in classrooms, the reduction of self-critical covert verbalizations of teachers, and also the self-control of physiological responses, such as heart rate. In addition, the component has developed a theoretical rationale for behavioral self-control. A nontechnical article on this work, entitled "Behavioral Self-Control: Power to the Person," by Michael Mahoney and C. Thoresen,

is soon to be published as an SCRDT R&D Memorandum. Also, a laboratory experiment has been performed on the use of social modeling to increase the frequency of positive-feeling questions addressed to another person and the frequency of self-disclosing responses by that other person; results of this experiment will be presented in an SCRDT Technical Report late in 1972. A related experiment on the effect of treatments designed to increase the frequency of verbal and nonverbal assertive responses has been conducted (Thoresen, Robinson & Gugelmann, 1972).

As a result of the work since 1969, the component now stands in the following position: Considerable confidence has been gained in the validity of the theoretical formulations, in the degree to which significant independent variables can be manipulated as intended, and in the consequences of these manipulations for the kinds of covert and overt behavior with which the component is concerned. Although many questions of theory and method require further work, results thus far have indicated that the approach is likely to be fruitful and effective.

Plans for developmental work. In short, this component is now ready to undertake further research and development aimed at the preparation, within two years, of materials (e.g., a training procedure for developing teachers' skills in observing their own covert and overt responses) ready for field testing on teacher education programs. During FYs 1972 and 1973, the overall purpose of the component will be to prepare training materials for three basic aspects of personal competence as presently conceived: (a) self-observation, (b) environmental planning, and (c) individual programming. "Self-observation" has already been defined. "Environmental planning" refers to the ability of the person to plan and arrange his own external environment in such a way that it will be conducive to the kind of behavior that he is interested in achieving. "Individual programming" refers to the use by the individual of internal stimuli and consequences in such a way as to bring about desired change in his own behavior.

During FY 1972, we intend to concentrate especially on the first of these components, namely, self-observation. Self-observation or self-monitoring has been an integral part of many successful behavior modification projects. However, the specific effects of self-observation, only

recently examined (Kanfer & Phillips, 1971; Thoresen & Mahoney, in press), suggest that self-observation can be a powerful self-change procedure. The work in self-observation will be aimed at starting to develop an integrated training experience usable in teacher education programs. The experience will take the form of explicit training in how to observe selected overt and covert responses of one's own.

During FY 1973, a series of studies will be undertaken to investigate the effects of teacher self-observation in classroom and simulated classroom settings. The overt responses to be observed in themselves by teachers will include the frequency of positive nonverbal responses, such as gestures, smiles, and body postures. The covert responses to be observed in themselves by teachers will include the frequency of positive and negative imagery responses. In addition, the work will determine whether changes in teacher behavior influence observable student behavior.

The studies conducted to achieve these objectives will take the form of extended pilot work with individuals--teachers, prospective teachers, and students. One study will compare the effects of self-observation training on a teacher's positive verbal behavior. Following observations to determine the baseline frequency of the relevant behaviors, the effects of intervention in the form of self-observation training will be examined during and after training. The self-observation training, now being developed, will probably employ the social learning models to demonstrate how an individual can observe his own positive verbalizations, together with guided practice and immediate feedback on the accuracy of the observations. If possible, this training procedure will be compared with the use of an instructional manual that provides the trainee with verbal instructions in the self-observation technique.

Methods of recording of the frequency of self-observations by means of such devices as wrist counters, tabulation booklets, and portable hand counters will be compared, as will the timing effect of self observation, i.e., immediate observation compared with delayed observation. External observers, that is, other persons given proper instructions, will be used to validate the subject's observations of his external behavior.

The work will be done with individual subjects, without strong commitment to any single approach, so as to further the development of effective

techniques. The intensive work with individuals will permit the subsequent steps to be guided by the results of earlier ones. As training procedures are further developed through replication of results with individuals, factorially designed studies may then be conducted to compare different techniques and their interactions with selected variables. It is anticipated that these single subject studies will typically occur within an 8-10 week time period. Male and female subjects will be selected on a volunteer basis. A structured self-observation assessment experience is planned to permit identification of persons ineffective in self-observation.

The same approaches and designs will probably be used in investigations of methods of increasing the teacher's accuracy in observing his own positive nonverbal overt behaviors. In these studies, special attention will be given to the possibility of reactive effects of the self-observations, that is, the possibility that self-observation influences the frequency of the behavior being observed. Investigation of such effects will also use the "intensive design," one that permits continuous monitoring of the behavior of a single subject over time. The reactive effect will probably also be investigated by attempting to bring such effects under experimental control through the use of reversal and multiple baseline designs. In such designs, the intervention is applied, then removed, then reapplied, and measures of the dependent variable are compared accordingly. (See C. E. Thoresen, "The Intensive Design: An Intimate Approach to Research." Paper given at the AERA Meetings, Chicago, 1972.) During 1973, such intensive studies will be made with approximately ten individual subjects. This plan will permit the replication of the studies to a degree sufficient to insure reasonable confidence in the dependability of the results. The replications will be aimed at clarifying the factors underlying otherwise unexplained individual differences in responses to the treatment.

The research pattern described above will also be used in investigating methods of improving the accuracy of self-observation of covert behavior (positive and negative thoughts about oneself, positive and aversive imagery, heart rate, and muscle tension). Since by definition the reliability of covert responses cannot be determined, it will be desirable to develop methods of "externalizing" such covert behavior. An example of the

goal here is that of determining whether changes in the frequency of positive thoughts about oneself are reflected in the frequency of positive verbal overt behavior. If such external indices of covert behaviors are validated, it will follow that increased reliance can be placed on data concerning covert behavior.

Although the Component Leader (Professor C. E. Thoresen) will be on sabbatical leave during the academic year 1973-74, it is planned to continue the work during that period. Plans will be made to employ an appropriate R&D Associate for that year to continue the work on this component along lines to be laid down. If the self-observation studies are fruitful, studies will be initiated to lay the basis for the two other components of personal competence as presently formulated (environmental planning skills and individual programming skills). Studies of these skills and ways of improving them will comprise the work to be undertaken in 1974 and 1975.

Component 1G. Reinforcement Strategies Training Development

(Pauline S. Sears\*)

Expanded Description

The objectives of this component are to delineate reinforcement strategies that can be used by teachers to improve children's achievement, self-concept, and belief in internal control of reinforcement, and to develop training materials which promote development of such strategies.

The problem.

It is clear from the Coleman Report (1966) and other research (e.g., Davidson and Greenberg, 1967; Crandall et al., 1965; Battle & Rotter, 1963; Leftcourt & Ladwig, 1965; and Loye, 1971) that the difficulties many so-called "disadvantaged" children face with school learning are associated with two factors: (a) their perceptions that they lack control over the effective reinforcements accruing in the school setting, and (b) their self-perceptions of lack of competence at school learning.

While low-income black children score lower, on the average, on aptitude and achievement tests than middle-class white children, there is still wide variability in both groups. Considerable work is now being done on influences on student development in the cognitive areas. The present component seeks to identify teaching methodologies which contribute to improvement of achievement through shaping the motivational and belief systems of disadvantaged children. The long-term purpose is to delineate training procedures that will make teachers more competent in developing beliefs in the child that school achievement is worthwhile to him personally and that he is himself competent to do something about it.

The component thus deals with a group of teaching skills needed for students who differ in certain motivational variables. It complements other components of the program on Teaching Effectiveness and also is relevant to the program on Teaching Students from Low-Income Areas. It is expected to result in aptitude-treatment interactions in which student

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\*This report and the design of the project have been developed with the assistance of Leonard Beckum, Marianne Block, Janet Crist, Joanne Gamble, Ronald Marx, and Judith Hubner.

motivational variables will serve as aptitudes, and types of reinforcement by the teacher will serve as treatments.

It is likely that the inattention and lack of effort in school of advantaged or disadvantaged children are largely due to attitudes of powerlessness in achieving effective reinforcement by solid work. In some cases these attitudes are probably realistic--the child has had experiences with teachers which indicate to him that he is in effect powerless to achieve any rewards through attention and effort. It is generally thought that low-income children suffer more from teachers' stereotyping than middle-class children, and, in fact, some data show a positive relation between children's socioeconomic status and their belief in internal control of reinforcement. The tragedy is that discrimination against disadvantaged children means that they are taught to believe that they cannot achieve rewards from school learning. For this and other reasons, they do not learn well. Thus, they suffer a handicap in promoting their own success. All this constitutes a vicious circle which should be broken early in the school years.

Even where teachers give reasonable heed to individualization of work and are acceptant enough to view the child's performance fairly objectively, many children hold self-defeating attitudes, perhaps developed from experiences with parents, earlier teachers, or peers. These attitudes may baffle even highly competent teachers and severely reduce the level of the child's receptiveness to good teaching.

Recent work in this component has shown that certain teaching methodologies, adapted to subgroups of children selected on the motivational variables previously mentioned (belief in internal control of reinforcement and positive self-concept), can improve children's attitudes and achievement. This work needs to be extended and also to be made more precise in order to provide a solid basis for the incorporation of its findings into the Model Teacher Training System.

This component is a five-year undertaking; in the spring of 1972, the third year is being completed. Projections of the work can be made for the subsequent two years.

The first year (1969-70):\*

Six third-grade classrooms and their teachers, in a low-income, predominantly black area, were studied under natural conditions, without intervention aimed at changing the behavior of pupils or teachers. In the fall and spring (in some cases one only), measurements were made as follows.

1. Teacher classroom behavior was assessed by naive but trained observers, using a new observation schedule devised to tap behaviors considered to be especially relevant to the purposes of the study. Existing schedules, developed by Flanders, Medley, Spaulding, and Sears, were examined, and material was selected from each.

2. Ratings of the children were made by their teachers on four dimensions of competence: physical, social, emotional, intellectual.

3. The verbal achievement of the children was measured with the California Achievement Test.

4. The self-concept of the children was measured with the Sears Self-Concept Inventory (Sears, 1966), which assesses nine areas of self-perceived competence.

5. The children's belief in internal control of reinforcements (locus of control) was measured with techniques based on those of Crandall et al. (1965), and Hess (1969).

6. The social distance of the children (Cunningham, 1951) was measured by means of ratings by the children of their own and their classmates' perceived position in the social hierarchy of the classroom.

7. The classroom behavior of children was assessed by trained observers using a schedule dealing with motivational, task-oriented, and social behaviors.

Results of the first year's work are briefly presented here. The evidence suggests the importance for children's verbal achievement of an individualized style of teaching as contrasted with a whole-group type of instruction. The former style appears to be especially effective with children who show higher self-concepts to start with. Development of

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\*Note that "years" as used in this summary refers to the standard school years, not to SCRDT's fiscal years.

self-concepts and belief in internal control of reinforcement appears to proceed more favorably for children who are well regarded socially by teachers and peers. Teacher behavior of listening to children with approval also comes out as effective.

Results to date. A Technical Report presenting statistical findings, discussion, and evaluation has been drafted. The most general expectations for the results were that (a) taking into account children's motivational characteristics of self-concept and belief in internal control would improve the prediction of tested end-of-year achievement, (b) teacher classroom behavior could be shown to affect the two motivational variables as well as achievement, and (c) an interaction between self-concept, belief in internal control, and teacher style would be found in accounting for variance in children's achievement.

Findings concerning the effect on achievement of relatively high or low self-concept and/or internal control were as follows: (a) It was found that past achievement (the pretest measure) carried most weight in the prediction of later (posttest) achievement. (b) Among children whose pretest achievement was relatively low, the self-concept and belief in internal control were positively related to the level of posttest achievement. (c) Among children whose pretest achievement was relatively high, the self-concept and belief in internal control carried less weight in relation to posttest achievement. Possibly lower self-concept acted as a spur to children who set high standards for their own accomplishments. (d) Over the entire sample, varying from low- to high-pretest achievement, there were moderate positive relationships between posttest achievement and self-concept, but the correlation between posttest achievement and belief in internal control was close to zero.

The results on the teacher behavior variables were as follows.

1. It was hypothesized and found that better verbal achievement occurred in classrooms in which the teacher typically (a) did more listening and responding than initiating; (b) interacted more with a single child than with the whole group; (c) interacted more privately than publicly; (d) gave a relatively high proportion of approval to children; (e) was

relatively low on controlling behavior; (f) interacted with students more often concerning subject matter than behavior; (g) was higher on undivided than on divided attention when interacting; (h) when criticizing a child's work, gave an explanation, rationale, or alternative; (i) evaluated work with children (i.e., gave feedback).

2. It was hypothesized, but not found, that higher self-concepts would occur in children for whom the teacher typically responded and listened more than she initiated; gave approval, offered choices, developed subject's idea, suggested equality more than interacting with controls; responded or listened to a single child with approval about subject matter.

3. It was hypothesized, but not found, that belief in internal control would be correlated with approval by the teacher. It was found that teacher approval carried less weight, as was expected, since it is a form of external, rather than internal, reinforcement.

#### The second year (1970-71).

Based partly on the relationships found between naturally occurring teacher behavior and measures of the children (achievement, self-concept, and belief in internal control) in the first year of the study, and also on theoretical conceptions of our own and the work of others, a plan was devised for two sets of year-long in-service workshops for teachers. The design was that of a randomized pretest-posttest control-group experiment. One group of teachers (N = 10) participated in semi-monthly workshops devoted to treating the teachers as "Origins," or persons who control their own lives and ideas (de Charms & Carpenter, 1968), rather than as "Pawns," or persons who are at the mercy of others. The substance of the workshops was children's motivation and its effect on their achievement. Training materials were tried out in the workshop as a basis for their subsequent incorporation into the Model Teacher Training System.

A second group of teachers (N = 9), intended to serve as a control group, met separately for instruction in an innovative approach to science education. Both groups taught self-contained fourth-grade classrooms, and the total group comprised all fourth-grade teachers in the same low-income, predominantly black school district from which the first year's group was drawn.

Evaluation of the year's experiment was based, for both groups, on the same measures as those used in the first year. In addition, for the science education group, the children's language productivity was measured at the beginning and end of the year. One product of the year's work with the motivation group was the training materials used in the workshops and evaluations of their effectiveness.

Results to date. The data for the second year are still being analyzed; the findings will be presented in a second Technical Report. At this stage, it looks as if there is fairly good confirmation of the first year's findings. But the children in classrooms of the teacher group that participated in the workshop on motivation did not differ from the pupils of teachers who participated in the "science education" workshop on the three dependent variables: posttest achievement, self-concept, and belief in internal control. Certain hypothesized relationships between teacher behavior and these dependent variables did appear, but the variability within the two teacher groups exceeded that between groups. The same result occurred when language productivity was used as the dependent variable in a separate project using the same teachers. Evidently neither intervention with teachers (i.e., neither the workshop on science motivation nor the science education training) had significant effects on these children's achievement and attitudes. The possible reasons are at least two: (a) the interventions were not powerful enough to alter the teachers' well-established patterns of interaction with their students; (b) by the fourth grade, children's achievement and attitude patterns are fairly fixed and not easily subject to change by teacher influence. The latter possibility is supported by the large amount of variance appearing from pretest measures in prediction of posttest on the child dependent measures.

The third year (1971-72).

During the current year, the subjects, instead of being teachers scattered in eight different schools and having little contact with one another, are a group of 25 teachers in one school (grades 1-6). The group includes the school's principal, vice-principal, consultants, and secretary, as well as the primary- and intermediate-grade teachers. The plan calls

for the commitment of an entire staff of teachers and administrators to the creation, through cooperative effort, of more positive attitudes and more constructive behaviors in their school. The project entails a year of concerted effort to systematically explore alternative ways of effecting change in the school and to evaluate different teaching methods, while attempting to increase understanding of the problems of concern to the professional staff.

The research approach is one in which professionals apply principles and theories provided by the behavioral sciences to the practical problems in the field situation, namely, the classroom. A careful record is kept of the approaches planned and carried out by individuals or groups of teachers, and ways of measuring the effectiveness of each method are used to evaluate possible causes of the relative success or failure. An important aspect of the research has been the involvement of teachers in the problem solving and in the evaluation of whatever is tried. The intent is to utilize the field experience of teachers to connect theory and practice and to provide resources whereby teachers can receive support as they identify problems or desired changes, consider alternative approaches to solving a problem, experiment with selected methods, evaluate the results of their experimentation, and make recommendations for future practice. It is intended that the participating teachers will increase their skill in problem solving and thus contribute toward the development of a self-renewing process. The project should result in a self-perpetuating cycle of professional growth established by a cooperative staff seeking expanded competence and effectiveness.

At a preschool workshop held during the last week in August 1971, almost all teachers of the school participated in exploring alternative methods of classroom management to increase pupil self-direction and responsibility, and in studying the nature of student attitudes toward school and self. During the workshop, the teachers studied classroom techniques for increasing pupil self-direction, oral interpersonal communication, achievement motivation and behaviors, and positive feelings about the school experience. It is expected that, if the staff efforts are successful, pupils will evidence higher achievement, less disruptive

behavior, and more positive attitudes about self, others, and the school in general. The findings, based on groups of children, will be reported to school personnel next year (without identification of either teachers or pupils).

On the last day of the preschool workshop, the following goals were set by teachers as primary objectives for the year 1971-72:

- (a) No corporal punishment will exist in the school.
- (b) Staff members will look for ways, each day, to increase rewards and reinforcement for desirable behaviors.
- (c) Each staff person will attempt to develop pupil self-concepts, power of self-direction, and responsibility.
- (d) Each staff member will attempt each day to increase open communication between herself and the pupils, between pupils as a classroom group, and between herself and other staff members.
- (e) As a member of the staff, each staff member will be committed to increasing teacher responsibility for decision making and evaluation.

The role of the researchers has been to provide assistance to each teacher requesting help in attaining her goals and to provide the staff with a general evaluation of the total school effort. Because change of the kind being sought is slow and difficult, it must be accepted that it will require a number of years with teachers, students, and parents working together to produce major results.

The project began by utilizing the efforts of the teachers alone. In November, student leaders from each intermediate classroom were organized to provide pupil leadership in involving all the students in the problem solving and commitment to change already initiated by teachers. In January, efforts to involve pupils in the primary grades to increase self-direction and appropriate behaviors were initiated along with more concerted efforts to engage parents in the problem solving and implementation of change.

Student leadership groups. Change of the kind being sought is virtually impossible unless the individuals involved are willing to work

to accomplish the change. For that reason, the project's plans have called for involving the students in creating the change, especially at the intermediate level (grades 4-6), where attitudes and behaviors tend to be more negative and resistant to influence. With the assistance of the teachers, a member of the research staff (Joanne Gamble) designed a plan for student leadership groups to be comprised of the two girls and two boys from each class who were most often considered by their classmates to be "most able to get me to do something." Those students have been meeting in two groups of 16, sometimes combined to make one group of 32, to study what changes would make the school a happier place and one of which students would be proud. The student leaders took back to their classmates questions regarding likes and dislikes, opinions regarding methods of change, and suggestions for plans. After several weeks of gathering opinion and information, including "shadowing" administrators to learn of their work and visiting the Municipal Council to learn about community leadership, the student leaders voted almost unanimously to focus their efforts on eliminating fights and bad feelings between children at the school. With the help of their advisor (Joanne Gamble) and the support of their teachers, the student leaders initiated a reward system to encourage students to control themselves and create a more desirable climate in the school. In this system, students record, at the end of a designated period, points for not fighting, not using unkind words, and obeying rules of the classroom and school. The students who have accumulated enough points during a set period of about a week are allowed to cash in their cards for tickets admitting them to "reward activities," cooking, dancing, sports, and drama. Because of the Christmas activities, a movie was provided as the first reward. In January the plan was continued for at least a few more weeks. Parents and competent teenagers are needed to help teachers with the weekly activities.

In January, the leaders also were grouped into task forces to serve the school. They received training in how to be a teacher's aide, helping children in the lower grades, and how to serve as monitors or office helpers. The monitors assist in the halls and yards. As they serve, they provide the other students with models of constructive pupil participation

in the functioning of the school. In mid-February, new student leaders were installed to provide more students with the opportunity to lead and serve.

Group-counseling activity. Another component of the project available to intermediate teachers is a group-counseling activity conducted by a member of the research team (Leonard Beckum). He is working with about six students chosen from each of several classes to receive specific instruction in how to study and to achieve success in school. The group has planned ways to establish better personal habits regarding school work and has discussed the problems related to their efforts to achieve greater academic success.

Dependent variables of the same sort as in the first and second years are being measured on the children before and after the intervention (the work with teachers and with children). Classroom observations of teachers are being made to determine what changes in their behavior occur. Some new measures have been devised to meet particular objectives of the various projects. As of March 1972, posttests of dependent variables on the children have not yet been obtained, and the success of the undertaking remains unevaluated.

The results of work in the third year will be presented in a third Technical Report and in two separate reports and publications on the leadership training and group counseling projects. The results will also take the form of a training element prepared for the Model Teacher Training System. Finally, the component will produce a descriptive account of more and less effective procedures for improving teachers' influence on children's motivation.

The fourth and fifth years (1972-74) (Projected).

Only a small amount of data will be collected during 1972-73. The work will be devoted to pulling together various lines of evidence, analyzing data to test hypotheses, evaluating the effectiveness of training materials and procedures, and disseminating reports and useful procedures and materials. Some followup work and testing of implementation procedures will be done as indicated by analyses of data. A training element will be prepared for incorporation into the Model Teacher Training System.

Technical Reports will be completed on each of the first three years of the work. More detailed descriptive accounts of the work with the teachers and children, with evaluations of its effectiveness, will be written. Separate reports will be made on the two projects involving leadership training of children and group counseling for better study habits.

It is likely that the analysis done in the fourth year will reveal that certain questions remaining unanswered can be investigated through experiments that can be undertaken in the fifth year (1973-74). Aptitude-treatment interactions may be investigated at this point, i.e., interactions between aptitudes of children, including motivational "aptitudes," and "treatments" consisting of teacher or classmate behavior.

Component II. Visual Media Analysis and Development

(R. E. Clark)

Expanded DescriptionThe problem.

Although visual media such as television and film are available in most American classrooms, little inquiry into their systematic use by teachers as an adjunct to effective teaching has been conducted. Previous research has tended to concentrate on media content (e.g., Hovland et al., 1949; Hoban & Van Ormer, 1950; Allen, 1960), differences in learning presumably caused by different media (Lumsdaine, 1963; Gagné & Gropper, 1965; Travers, 1970), and comparisons of live versus "media" teaching (Kemp, 1970). Mielke (1969) has argued that much of this research is useless to the teacher because no adequate comparisons of treatments were made, and hence the results are invalid. In addition, media research has been conducted as if the questions were unrelated to other problems in teaching, such as individual differences among students.

Future research on the selection and use of visual media in teaching must be based on valid questions derived from a theory of instruction. Without this approach we will continue to be faced with elaborate, expensive technologies and an accumulation of "significant differences" which are not generalizable. Knowlton (1964) suggested that the major conceptual difficulty in the systematic examination of the use of visual media in teaching has arisen from use of a categorization system based on the machine. Most researchers continue to assume a priori differences between, for example, film and television because they are different technological configurations. It is assumed that different machines will lead to different types of learning regardless of the characteristics of the learners or task.

Salomon (1970) reasoned that any conceptualizing of media should consider relevant aspects of the learner and the task. With this strategy, a medium could be defined as some shape of a stimulus which leads to mediating responses appropriate for a given learning task. Salomon (1971) presented data which indicate that subjects who had difficulty

attending to cues in learning were able to significantly increase the number of cues they reported in paintings when presented with a treatment which entailed "zooming" in on details of a stimulus, whereas subjects initially high on cue attending did not profit from the treatment. In the traditional design both groups would have been lumped together in one treatment, and "no difference" due to media would have resulted. Presumably the mode of teaching employed resulted in the development of a representational "code." A code here is a covert strategy for interpreting a stimulus. Once learned, a visual code can be generalized to a variety of visual experiences. When employed, a visual code allows a learner to re-present or "modify" visual stimuli to solve a problem. It could be inferred that in the course of the treatment, the low cue attenders acquired a cue-attending code which they generalized to the posttest. Initially high cue attenders may have already possessed the code and therefore did not benefit from the treatment.

Kanner and Rosenstein (1959) found no difference in learning between color-coded and monochromatic visual materials used in an electronics lesson. However, when students were separated into high and low verbal ability groups, an aptitude-treatment interaction (cf. Cronbach & Snow, 1969) resulted. The high-verbal-ability students profited most from the monochromatic version, and the low-verbal-ability students learned more from the color version. As Figure 1 indicates, the color-coded lesson appeared to interfere with the learning of the high-verbal-ability group, and the monochromatic version depressed the amount of learning displayed by the low-verbal-ability group. A partial explanation of these results is that the high-verbal-ability subjects had already acquired a method of coding the lesson materials for memory. The low-verbal-ability students, however, may have found the color code useful in the absence of an adequate (verbal?) code.

The significance of the problem to be attacked in this component arises from the possibility that many coding schemes may actually inhibit the learning of certain students. Kanner and Rosenstein (1959) and Salomon (1970) report that students who were initially high-aptitude scorers displayed fewer epistemic behaviors under one of the coding techniques.

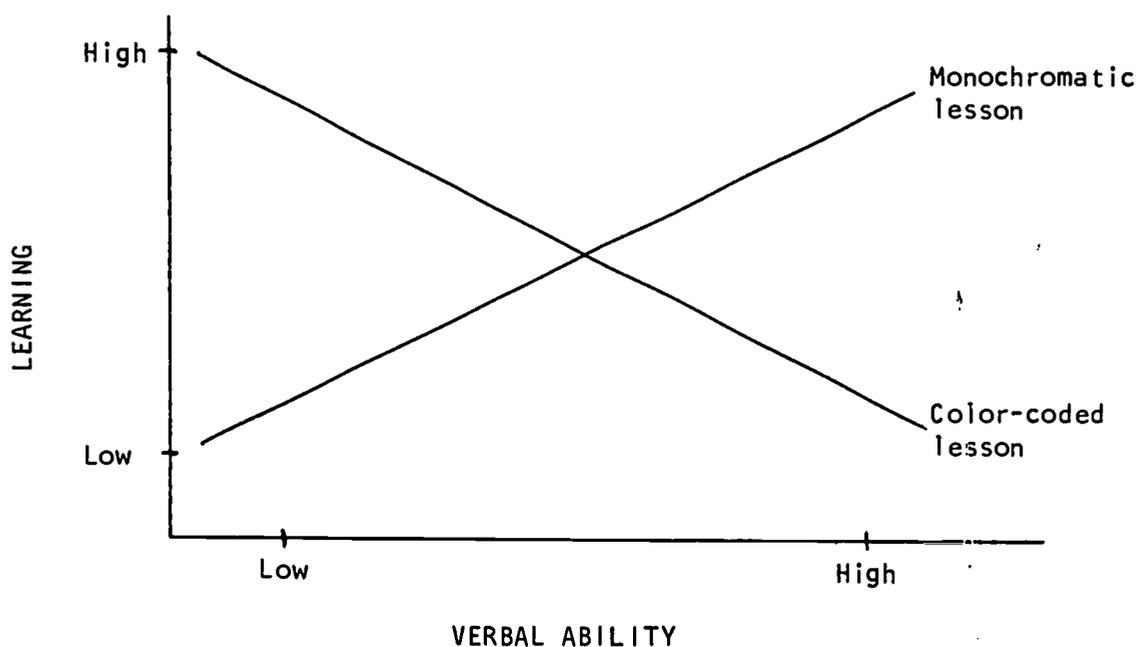


Figure 1

Stylized Version of an Aptitude-Treatment Interaction,  
Based on Data from Kanner and Rosenstein (1959)

To date, the psychological processes underlying this strategy have not been explicated. The previous theorizing which most closely parallels this approach has been done by Bandura (1965) and his colleagues. It appears that the teacher utilizing media codes is asking the learner to imitate selected representational schemes. Although Bandura has been concerned with the imitation of live models by learners, Berlyne (1965) suggests that imitation is not limited to verbal or muscular movements. Similarly, Piaget (1962) describes the imitation of operations and models as important in the development of intelligence. Reports of experiments by Bugelski (1970) support the approach. The immediate problem which prevents further work with this paradigm is the lack of a taxonomy of available media codes which can be integrated with work in individual differences and task dimensions.

Most previous attempts at media selection taxonomies (e.g., Bretz, 1971) have relied on the technological attributes of the apparatus which produce or display visual media. It is generally assumed by users of

media that movies produce a different type of learning than television because they are produced by different technologies or "look" different. Attempts to translate this assumed difference into comparisons of film versus television learning have been unsuccessful (Mielke, 1969). Salomon (1970) suggested that this entrenched method of categorization does not consider what the medium does to the learner. In other words, visual media should be categorized by attributes of the visual "field" or output that might be acquired by the learner. Thus film and television treatments would lead to similar results for many learning tasks. If attributes they do not share (e.g., size and definition of picture, à la McLuhan, 1965) were employed in instruction, they would not do anything to students to increase important types of learning. Research which has tested this notion provides considerable support for this conclusion. Attributes shared by these two media, such as the potential for displaying objects in motion, changing the viewer's perspective of an object (e.g., Salomon's "zooming" technique), and varying the rate of an object's motion all have potentially useful roles in teaching and learning. When these attributes are used as criteria for selecting a medium for instruction, either film or television could be usefully employed, along with any other method which provided the desired attributes. In the situation just described, the choice between film and television would be based on the availability and cost of either device.

It is anticipated that a strategy for medium selection based on this approach could substantially reduce the costs of using expensive technologies in teaching by directing high-cost treatments to the students who will benefit most from them and by avoiding the use of expensive media which might actually inhibit learning for certain students. The most useful form of such a strategy for teachers and media producers would provide information which would allow an efficient match between common instructional tasks and readily available media codes for presenting the task to students who have been grouped according to their task-related aptitude.

During the design and testing of the taxonomy of media, emphasis will be placed on the generalizability of the code treatments. Salomon

(1971), for example, has tested the zooming code with a number of tasks which require the ability to attend to cues and has generally found that the treatment effects remain stable. The taxonomy would be incorporated into a handbook on media selection and evaluation for teaching which would (a) list the different codes, (b) suggest ways of selecting or producing media products which will make use of a particular code, (c) provide examples of subject matter areas (tasks) where the codes may facilitate learning (including capsulized research results when available), and (d) provide information on instruments and techniques for evaluating results.

Neither the taxonomy nor the handbook produced by this component will provide a complete list of tasks, media codes, aptitudes, or evaluation possibilities. It is hoped that a unique strategy will be supplied which can provide the foundation for a systematic approach to media selection and use in teaching, research, the design and production of instructional materials, and the development of new technologies for education.

An exhaustive list of potential codes will be generated by (a) conducting a search of the literature for discussions of media "grammar" and psycholinguistics, (b) interviewing selected experts in media production to generate more extensive lists, (c) previewing selected examples of various media products designed for education and entertainment, (d) surveying available lists of educational objectives and tasks (e.g., Bloom et al., 1956; Flavell, 1963; Gagné, 1970) to determine whether codes might be available for familiar classroom tasks.

The list of media codes will be taxonomized by teaching tasks. This procedure is expected to increase the list's usefulness in research and evaluation and, eventually, in teaching. During the latter part of the first phase of the taxonomy development, a film will be produced to illustrate the various visual codes that appear in the taxonomy. It is expected that the film will be placed under limited copyright (if authorization is granted) and offered for use by teacher training institutions and by designers and producers of educational technology products.

Testing the taxonomy.

In the second phase of this component, codes which appear to be most useful for the teaching methods being studied at the Center will be extracted and tested. It will be important to determine whether certain of these code-models will apply directly to problems encountered in the Model Teacher Training System and in the program on Teaching Students from Low-Income Areas.

The taxonomy may provide some indication that unique teaching techniques can be developed. If so, the Model Teacher Training System may be designed to integrate certain features of media for the direct training of in-service and preservice teachers in teaching techniques and the use of media codes in instruction.

During this second phase of research, aptitude measures will be matched with appropriate media codes. At this point, the component will need to measure relevant individual differences. In most cases existing measurement devices should suffice to determine the extent to which the learner possesses the code before treatment. But new instruments may need to be developed for the more unique coding schemes.

Products.

The work in the second phase will depend on the appropriateness of the taxonomy. During this phase, the component will (a) integrate the media code selection and evaluation taxonomy into the Model Teacher Training System, and (b) integrate measures of certain individual differences into the taxonomy while producing and testing new instruments where necessary.

The major milestone at the end of this phase will be a revised handbook on a taxonomy of media selection and evaluation for teaching. This handbook will include an adequate description of individual difference measures to match with media codes for common instructional tasks. The handbook is expected to include descriptions of the more important combinations of codes and measures of individual difference in a form that will allow teachers to design or select visual media for their special teaching needs.

Work Schedule for Program I (Teaching Effectiveness)

Component IA

Activity IA1: Technical Skills

<u>Start</u>		<u>End</u>
9/71	Prepare technical report on questioning-explaining-listening experiment.	9/72
6/72	Assemble, try out, and assess initial version of Model Teacher Training System (MTTS).	9/73
4/73	Assemble second version of MTTS.	11/73
12/73	Try out and assess second version of MTTS.	9/74
9/74	Decide on the modification of the MTTS prototype.	4/75
9/75	Install MTTS prototype in teacher education institutions and school systems.	12/75

Activity IA2: Teacher Training Automat

<u>Start</u>		<u>End</u>
4/72	Develop and test second version of Teacher Training Automat.	1/73
7/72	Prepare technical report on evaluation of second version of Teacher Training Automat.	2/73
11/72	Develop and try out Teacher Training Automat, third (including mobile) versions, in other programs.	11/74

Activity IA3: Student Aptitude as Input and Output

<u>Start</u>		<u>End</u>
9/72	Review literature on inquiry, problem solving, and aptitude development.	12/73
9/73	Prepare technical report on literature review.	5/74
9/73	Construct and try out situational tests in pilot studies. Add relevant knowledge gained to Activity IB2 of Model Teacher Training System.	1/75
8/74	Revise and try out teaching-learning game studies and tutoring laboratory studies.	11/75
5/75	Prepare technical report on aptitude as an outcome of teaching.	11/75

Activity 1A4: Feedback to Teachers

<u>Start</u>		<u>End</u>
7/72	Conduct experiments on repeated rating feedback with individual teachers.	6/73
10/72	Conduct pilot studies on student signal system feedback to teachers.	12/73
9/73	Conduct experiments with packaged student rating feedback system self-administered by teachers.	7/74
8/73	Prepare and try out preliminary manual for use of student signal systems.	7/74

Activity 1B1: Assessment of Teacher Performance

<u>Start</u>		<u>End</u>
4/72	Conduct and report on conferences on teacher assessment by school districts.	12/72
12/72	Observe, consult, analyze, and report on school district practices in teacher performance assessment.	12/73
12/73	Prepare SCRDT manual and system on teacher performance assessment by school districts.	6/74

Activity 1B2: Assessment of Teacher Training System

<u>Start</u>		<u>End</u>
12/72	Prepare technical report on correlates of longevity in teaching, especially STEP teachers.	12/72
	Design and conduct validation studies on self-concept.	12/72
	Assemble tests for placement in Model Teacher Training System.	12/72
12/72	Develop a measure for assessment of one ultimate, one intermediate, and one immediate criterion of effectiveness of MTS.	12/73
1/74	Revise and revalidate measures developed in FY 73; initiate development of additional measures and information systems.	11/74

12/74	Conduct studies of effects of matching trainees' aptitudes to treatments according to ATI studies.	11/75
12/74	Conduct career pattern followup studies.	11/75

Component 1C: Longitudinal Study of Teaching Skills

<u>Start</u>		<u>End</u>
5/72	Transfer Intern Data Bank data and programs to Methodology Unit and Component 1A.	12/72

Component 1D: Conflict Reduction and Management Curriculum for Teachers

<u>Start</u>		<u>End</u>
9/70	Review literature on school disruption and teacher role definition.	7/72
9/71	Develop and validate instruments for studying conflict.	12/72
6/72	Develop and try out curriculum for teachers on conflict reduction and management.	6/73
6/73	Revise and re-try the curriculum and complete technical report and training manual.	11/73

Component 1E: Group Processes Training Curriculum Development

<u>Start</u>		<u>End</u>
6/70	Prepare and try out group process training curriculum ; incorporate into the Model Teacher Training System.	12/72

Component 1F: Personal Competencies Training Development

<u>Start</u>		<u>End</u>
6/71	Prepare, try out, revise, and validate materials and procedures for training teachers in self-observation techniques for incorporation in Model Teacher Training System.	9/73
10/73	Initiate development of procedures and materials for training teachers in environmental planning and individual programming.	9/74

10/75 Decide on developing additional elements: If decision affirmative, complete procedures and materials for training teachers in implementing. 1/76

Component IG: Reinforcement Strategies Training Development

<u>Start</u>		<u>End</u>
12/69	Collect data on token and social reinforcement; analyze data on leadership and on the second year.	4/73
1/72	Prepare technical report on second year.	6/72
3/72	Prepare report on token and social reinforcement; data analysis second year.	6/72
6/72	Develop training element for Model Teacher Training System.	9/73
6/72	Prepare leadership training technical report; complete report on third year.	12/73
12/73	Prepare detailed report on intervention procedures.	5/73
12/73	Incorporate products into Model Teacher Training System.	5/73

Component II: Visual Media Analysis and Development

<u>Start</u>		<u>End</u>
12/72	Develop a taxonomy of visual media codes.	12/73
6/73	Prepare film on taxonomy.	6/74
12/73	Prepare handbook on taxonomy.	12/74

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**IIB. PROGRAM DESCRIPTION**

**Program 2, The Environment for Teaching**

## 11B. ENVIRONMENT FOR TEACHING

Program DescriptionWhat problem will the program attack?

How can the role of the teacher be restructured to improve the educational decision making demanded by newer conceptions of teaching and learning? Some of the current innovations in curriculum and instruction (for example, many of the more elaborate systems of teaching reading) demand that schools have the capability for professional problem solving, for diagnosis, and for evaluation and control of teaching tasks. Conventionally organized schools structure teachers' roles in a fashion that prevents the adoption and maintenance of many of these more complex innovations.

For the past four years the Environment for Teaching program has been studying the effects on teachers and learners of such organizational factors as (1) the evaluation of teachers; (2) the way teachers are organized for work; and (3) the teacher's participation in system-wide decision making. We have used organizational innovations such as team teaching in open-space schools to investigate the implications of organizational change for (1) the status of the teacher; (2) the level of technical-professional culture among teachers; (3) the basis for evaluation of teachers; and (4) children's classroom behavior.

We are in a period of accelerated innovation in organizational structures as well as in curriculum and instruction. At this critical juncture, educational decision makers need guidance on questions such as the following: What are the most important considerations when the faculty of an open-space team-taught school undertakes a complex innovation in curriculum and instruction? If some of the teams are experiencing problems as a group, what can be done about it? Do group-process problems have to be solved before complex new teaching tasks are undertaken? Can teaching teams carry out the process of adaptation of an innovation to the particular needs of teachers and learners without the addition of expensive consultants and central district staff assistance? If classroom teachers

operate in isolation from each other, can a complex innovation in teaching be introduced without an accompanying increase in staff resources allocated to help the teachers with the process of adaptation and with the continual evaluation demanded by the new teaching task? If extra resources are not available, is it a total waste to try out the innovation anyway?

From the point of view of the researcher, these questions take the form: What kinds of organizational change will provide evaluation of complex teaching tasks? Under what organizational conditions will teachers be able to maintain complex innovations in curriculum and instruction? Under what conditions can teaching teams develop their own complex conceptions of the process of teaching and learning?

From the point of view of the disseminator of a new curriculum or instructional package, the likelihood of successful implementation of such concepts or materials within schools can be much increased if more is known about their probable persistence within different types of school organizational structure.

Our studies have documented the weaknesses of the conventionally organized school: the failure of an evaluation system to control effectively the task of teaching, and the low level of professional interaction between teachers. Changes in the structure of school organization, such as team teaching in open-space schools, have suggested that there is a potential for a Collaborative Teacher Group Model of school organization which would allow teachers to control and evaluate the teaching task as a group of professional colleagues. However, the observed variability in what is called "team teaching" indicates that this revision of the teacher's role will not achieve its potential without systematic pursuit of its problems and prospects. As an alternative, comparison of the evaluation systems used in schools with those used in other organizations has suggested a second possible revision in the organization of the school: the Staff-Line Support Arrangement Model.

The wide variety of recent changes in school organization and in curriculum and instruction is well known to educational researchers and administrators. The researchers in this program are, however, thoroughly

convinced that these innovations are occurring with almost no knowledge of their probable consequences for teachers and learners. New ideas such as team teaching or differentiated staffing are tried out; no one knows how to define their "success"; unanticipated problems such as team conflict arise; the school administrator is at a loss for solutions. After several years of trying to patch things up, the innovative school is ready to try the next idea because there was no systematic basis for solving the problems generated by the last one.

By developing a general model for looking at the status of teachers in the organization of the school, and by developing a general way of classifying innovations in curriculum and instruction in terms of the demands each makes on the school staff for diagnosis, evaluation, and professional problem solving, we are reaching for a level of generalizable knowledge applicable to currently available innovations, to innovations not yet invented, and to prospective changes in the role of the teachers not yet implemented. Research instruments developed over these four years of study have considerable potential for evaluating the effect of organizational change on the evaluation of teachers, the evaluation and control of teaching tasks, professional communication among teachers, and the status of the teacher in influence and control over educational decision making, as well as (and in no sense last in importance) changes in the role of the student.

Without having to tie recommendations to some particular curriculum and instruction approach or to some specific organizational design, we are seeking a set of "sufficient conditions" in school organization for the effective control and evaluation of the teaching tasks and for increasing the professional problem-solving capability of the school staff. Educational decision makers might then have a rational basis for designing organizational changes relevant to desired features of curriculum and instruction. At the present time, we see structural changes occurring with no relation to what and how the teachers are teaching. We propose to spell out some important connections between the structure and the educational substance of schools--connections vital to a rational planning process.

Anticipated outcomes. Evolution of the program since the October 1971 Annual Budget Justification has resulted in two development components and two research components. The two development components are designed to yield products of general utility as well as playing an integral role in the development of knowledge about the two organizational models.

One development component, The Role of Colleague Groups in Improving Teachers' Performance, grew out of studies of morale problems in teacher teams. Dr. Molnar has undertaken to design a system of support services which will improve the problem-solving capability of teaching teams and allow them to share participation and decision making in a more balanced fashion. Improvement in group functioning as a result of treatment will be evaluated on an experimental basis. When completed, these support services will be "packaged" in such a way as to be helpful to schools where the architecture or the staff requires a team approach.

The second development component, Evaluation Model for Differentiated Staffing, is attempting to use our research instruments as a means of gauging the success of an organizational innovation. The anticipated outcome will be a package of instruments with instructions for their use, processing the data obtained, and interpreting the results. The criterion of the usefulness of these instruments will be the ability of school district staffs to use them in determining the level of investment required to achieve a desired degree of success in reaching specified objectives, such as evaluation and control of the teaching task or adequate functioning of teaching teams as colleague groups.

The anticipated outcomes of the large Longitudinal Study, a research component, include the identification of a set of constraints on the adoption of innovations we have classified as placing heavy demands on the school's capacity for diagnosis, evaluation, and professional problem solving. We hope to be useful to educational decision makers by making clear the economic waste involved in adopting and implementing expensive technology without investing in organizational change. If decision makers are willing to reconstruct the patterns of organization of teachers, we hope to have available several successful models. In the case of the

Collaborative Teacher Group Model we will be able to offer supportive techniques for achieving better group process in teaching teams. Results of the organizational experiments in the Longitudinal Study will enable us to make some estimates of the main problems and costs of such reorganization. Most important, we will be able to offer ways to monitor the continuing effectiveness of the evaluation system and the growth of technical-professional culture among the staff. Incidentally, we would hope to be able to suggest methods of teacher task evaluation which provide accountability without having to face the problem of individual teacher evaluation in the traditional sense.

In this effort, we are trying to arrive at some "sufficient conditions" statements concerning what we have learned will be essential to do "at the very least." We cannot of course guarantee that generalizable knowledge will be obtained from this series of studies. We are only now at the stage of the first empirical test of propositions dealing with curricular and instructional innovations in schools with simple and complex organizations.

On what basis would the educational decision maker have confidence in our advice? Because we have developed a conceptualization as to why certain types of innovations demand restructuring the role of the teacher, we will be able to check out deliberate change in this role at theoretically critical points. These include the way the teacher carries out the diagnosis, evaluation, and problem solving demanded by the teaching task; the way the organization monitors the outcomes of teaching tasks; the level of analytic problem solving achieved by the staff; and, finally, the question of whether or not a complex task persists in its complex form or deteriorates to a simpler, more routine, form of the original task process.

The second research component (Organizational Change), a study of 300 schools of higher education, examines the decision dynamics of the larger system, with special emphasis on the role of the (higher education) faculty in system-wide decision making. This approach, with its emphasis on exploring new roles for faculty who have traditionally been ineffective in system-wide decision making, is quite consistent with that of the pro-

gram as a whole. Besides its descriptive output on the present status of faculty participation in decision making at the higher-education level in the United States, this component will help to suggest limiting conditions for the restructuring of teacher status within any school, based on limitations of teacher status in the school district as a whole.

Value assumptions. Key value assumptions underlie this program. We believe that it is better for teaching to proceed on a rational basis, taking into account the multidimensional nature of the teaching task, rather than on a wholly intuitive basis or on a partial basis, dealing only with a single dimension such as the individual's rate of learning. This judgment accounts for our interest in restructuring the teacher's role in such a way that schools will be able to handle innovations within a multidimensional conception of the process of teaching. Both proposed models of school organization are hypothetically capable of utilizing highly complex conceptions of the process of the teaching task.

Furthermore, the program assumes that failure to provide effective evaluation of the task of teaching is lamentable. It is unlikely that the effectiveness of teaching can be substantially improved without meaningful evaluation of that task. The view of teaching as a routine, simple task, coupled with the failure of effective evaluation of the outcomes of teaching tasks, has exacted a fearful cost in the high percentage of children who have emerged from the public schools labeled as "failures." This program may indeed be unique in its assumption that many of the failures of teaching are not so much due to failures in teacher training or of curriculum developers to disseminate their products, but lie more in failures to organize and support teachers so that they can either solve some of these problems themselves or receive assistance in the course of their work which will allow them to proceed in a complex yet rational manner.

For example, because we lack an underlying science of the teaching of reading, many of the new reading technologies have problems which the practitioner will discover in attempting to apply the technology to a particular group of children. Rather than reverting to traditional means, teachers might work as a collegial group to adapt the technology in a way more suitable to their styles of teaching and the problems of their par-

ticular students. Alternatively, the school might provide expert assistance at these critical points to help in working out the adaptation of the system to a particular school.

What overall strategy will be used to achieve the desired results?

Thus far the program has followed two main lines of research on elementary and secondary school teachers. One line has diagnosed and documented the weaknesses in evaluation and control of the teaching task. Using their theory of organizational authority structure, Scott and Dornbusch have been able to describe how schools fail to meet the criteria of a rational evaluation system compared to other organizations they have studied in the past. Evaluation systems were examined in elementary and secondary schools, in alternative schools, and in a comparison between teaching teams and nursing teams. This line of research has now proceeded far enough to take into account the nature of the teaching task itself as conceived by teachers. To meet the needs of faculties wishing to adopt certain innovations in curriculum and instruction which demand diagnosis, evaluation, and professional problem solving, Scott and Dornbusch have developed an alternative model of school organization. The Staff-Line Arrangement Model would supply necessary technical and expert support to the teachers--skills that they have neither the time nor the training to develop. This is the model successfully employed by many other kinds of organizations.

The other main line of research on public school teachers has studied the effect on teachers and learners of the organizational change represented by team teaching in open-space schools. This structural innovation has a demonstrable impact on the way teachers work together as well as the teacher's sense of influence and control over educational decision making. Observations of team teaching reveal both its unsolved problems and its potential as a collegial group capable of developing some of its own technical-professional culture. The model of organization arising from this line of research has been called the Collaborative Teacher Group Model.

This year, we are ready to merge these two lines of research into one large longitudinal study of the relationship between teaching tech-

niques, tasks, and procedures and the two models of school organization: Staff-Line Support Arrangement Model and Collaborative Teacher Group Model. In this Program Description, the large longitudinal study will be referred to as The Organizational Status of Teachers and Change in Teaching Tasks.\* In this longitudinal study we will follow selected innovations in curriculum and instruction over a two-year period as they are adopted, developed, or abandoned in schools with different kinds of organization. We will focus on schools with the newer, more complex structures approximating the Staff-Line Support Arrangement Model and the Collaborative Teacher Group Model. For comparison purposes, conventionally organized schools which have also attempted to adopt the particular innovation will be selected.

The longitudinal study hypothesizes organizational conditions necessary for the survival and adaptation of complex innovations in curriculum and instruction. We have predicted that without some organizational change to control and evaluate the outcomes of teaching tasks, and without some increase in the problem-solving capability of the faculty, many promising innovations will gradually drop into disuse.

If the propositions of this longitudinal study are supported by the data, we will be ready to move to a deliberate reorganization of schools on an experimental basis in conjunction with the introduction of innovations in curriculum and instruction. By identifying the organizational models associated with successful outcomes in the longitudinal study, we can acquire considerable confidence in the statement of organizational changes necessary for the successful adoption and adaptation of new conceptions of the process of teaching and learning.

The pattern being followed is indicated in Figure 1.

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\*For the formal title of Component 2A, which is responsible for this study, see the Program Register and the next section of this Program Description.

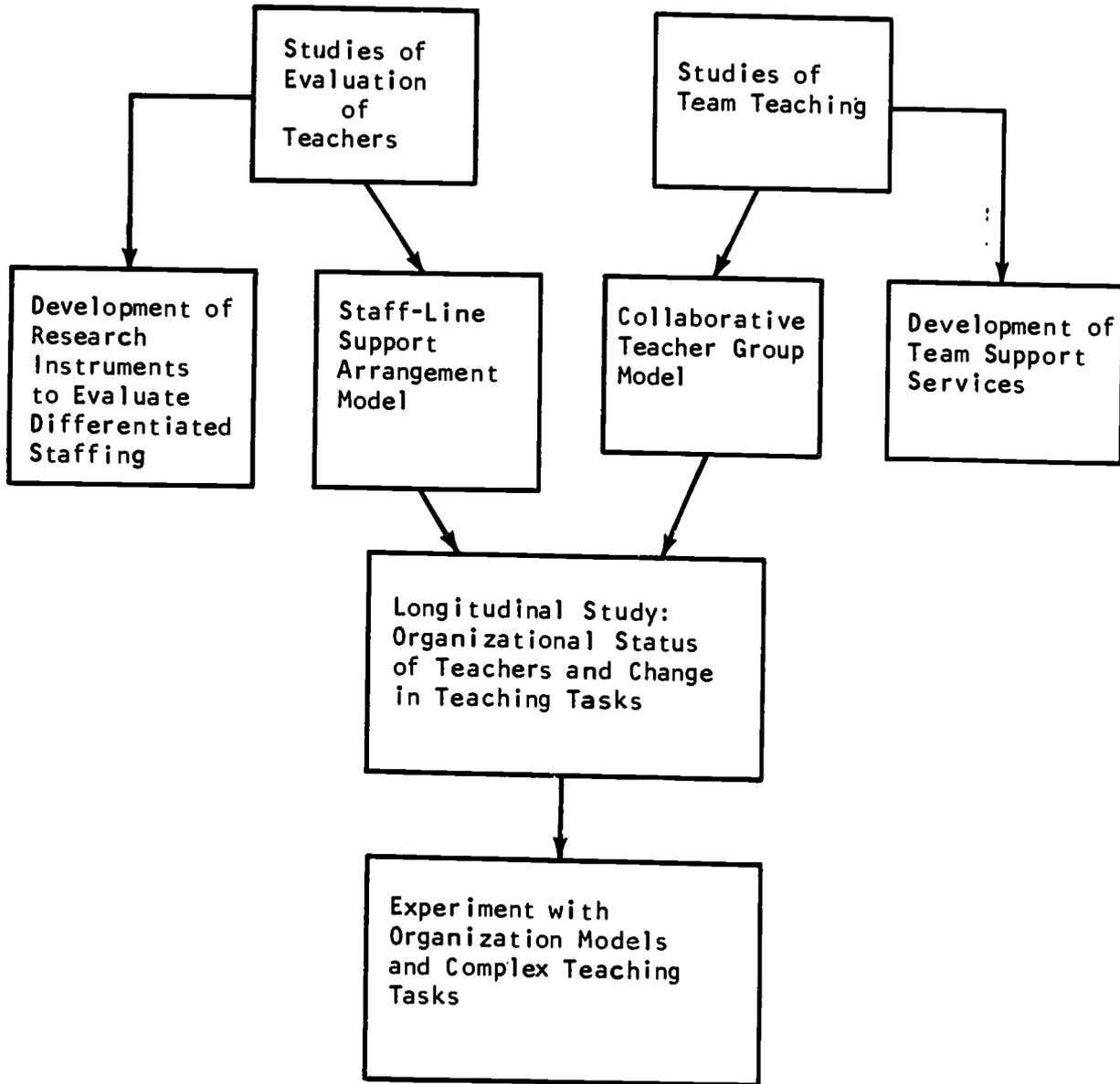


Figure 1  
Overall Strategy of Environment for Teaching Program

Decision to omit Differentiated Staffing study. Originally, the plans for FY 1972 called for the beginning of a longitudinal study of differentiated staffing. After careful evaluation, the program staff changed its plans for the following reasons.

1. Plans providing for teachers to be promoted through differential ranks were essential for the projected study as an example of a viable evaluation system for teachers. But few such differentiated-staff plans exist in this region. Instead, the prevailing pattern in Northern California, which Dr. Brunetti is studying, is a combination of teachers and teacher aides on a team.

2. The second major reason for abandoning the longitudinal study of differentiated staffing was a shift in program focus to the nature of the teaching task. The problem of a viable evaluation system for teachers will probably not be solved by proposed methods of direct teacher evaluation. Rather, an alternative solution might be the evaluation of particular teaching tasks set within the framework of the curricular and instructional techniques being used. For example, an inquiry-based curriculum might evaluate the effectiveness of a team's work by scoring the "inquiry activity" on the part of the students responding to the curricular treatment. If the instructional approach has not achieved the desired level of active inquiring behavior, the team might decide to give some aspect of the instruction more time and emphasis to see if such treatment brings the desired improvement.

Our concern with the content of teaching as well as the organization of teachers has led us to the Longitudinal Study of the organizational conditions under which such careful evaluation of teaching tasks might take place. We plan to select schools where innovations have been installed which demand a high level of problem solving and evaluation by the staff. Many of the other questions concerning teacher dropout which we had wished to examine in the previous study will be open to study in the projected one as well. The same instruments are applicable although some new ones are being developed. Finally, the consequences of the projected longitudinal study have a greater generalizability and applicability.

Relationship to past and ongoing work. As Figure 1 indicates, the longitudinal study grows directly out of past studies of evaluation of teachers and past studies of team teaching. The most important findings of these studies, which have influenced the development of the alternative models of teacher organization, are sketched in this section.

We have been able to take advantage of contemporary innovations in the organization of schools, such as team teaching in open-space schools, to examine consequences for teachers and for children of a profound change in the way the work of teaching is carried out. At the most general level, our findings have demonstrated the significant impact of structural change on teachers and children.

Using a combination of survey and behavioral observation techniques, we have been able to document strong associations between variations in the way the work of teaching is organized and teachers' sense of influence, autonomy, the amount of colleague interaction, and job satisfaction. In an initial survey of 110 teachers in nine open-space schools and 120 teachers in eight self-contained classroom schools, we examined the impact of team teaching in a physical setting affording visibility to fellow teachers of the process of teaching. Table 1 summarizes the marked differences in response to our measures of interaction, influence, autonomy, and job satisfaction (Brunetti, 1971; Meyer et al., 1971, Chap. 2<sup>\*</sup>).

In a systematic study of teaching teams in these open-space schools, Molnar (1971) traced differences in questionnaire responses about the teacher's sense of influence and autonomy to the teacher's participation within the discussions of the teaching team. She isolated some teams in which all the teachers had a reasonable chance for participation, calling these balanced teams. Participants in balanced teams were more likely to report being influential and having control over their work (autonomy) than were teachers in unbalanced teams. Furthermore, in unbalanced teams a sense of influence and autonomy was positively associated with observed participation on those teams. These relationships between autonomy and participation in balanced and unbalanced teams are shown in Tables 2A and 2B.

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\* Full citations of works not cited in full in this section will be found in the section on Accomplishments and the list of references.

TABLE 1

Proportions of Teachers in Open-Space and Self-Contained Classrooms Scoring High on a Series of Indices Characterizing their Jobs

	Open-Space Teachers (N = 110)	Self-Contained Classroom Teachers (N = 120)
1. <u>Teacher Group Interaction</u> : "When you meet with school committees, teams, or teacher groups, how often do you discuss [six listed task areas]?"	61%	21%
2. <u>Informal Colleague Evaluation</u> : "How often do you receive feedback and/or advice from other teachers about your own [teaching practices in five listed areas]?"	61%	32%
3. <u>Teacher Group Influence</u> : (a) "How much influence do school committees, teams, or teacher groups have over your own [teaching practices in five listed areas]?"	44%	18%
(b) "How much influence do school committees, teams, or groups here in this school have over [school policy in five listed task areas]?"	39%	16%
4. <u>Principal Influence</u> : (a) "How much influence does the principal have over your own [teaching practices in five listed areas]?"	18%	38%
(b) "How much influence does the principal have over [school policy in five listed task areas]?"	26%	40%
5. <u>Teacher Autonomy</u> : "How much influence do you have over your own [teaching practices in five listed areas]?"	86%	70%
6. <u>Job Satisfaction</u> : [An index made up of five questions about satisfaction with present job, teaching, willingness to leave teaching, and likelihood of choosing teaching as an occupation if respondent were starting out again.]	46%	28%

TABLE 2A

Percent of Teachers Reporting "Low" and "High" Autonomy  
among Teachers in Unbalanced and Balanced Teams

Type of Team	Reported Influence on Teams		Reported Autonomy	
	Low	High	Low	High
Teachers in Unbalanced Teams (N = 52)	50%	50%	51%	49%
Teachers in Balanced Teams (N = 24)	25%	75%	33%	67%

TABLE 2B

Distribution of "High" and "Low" Scores on the Index  
of Reported Autonomy among Teachers Scoring  
"High" and "Low" in Participation  
(Unbalanced Teams Only)

Participation	Reported Influence on Teams		Reported Autonomy	
	Low	High	Low	High
Low (N = 25)	60%	40%	60%	40%
High (N = 27)	33%	67%	19%	81%

Many of the teams studied by Molnar showed severe problems in group process leading to morale problems. Team teaching appears highly variable, and we have some evidence of deterioration in team size over time. In the open-space schools, the division of labor on the team is often very primitive, requiring very little cooperation; teachers often rebuild barriers in the open pods or put up portable walls so as to regain the effect of the self-contained classroom. Although team teaching in open-space situations appears to offer some potential of a true collegial system (such teachers are more likely to think that teachers ought to evaluate each other), the unevenness in morale and in participation in team planning is evidently causing administrators to give up on team teaching before its potential is thoroughly understood.

Molnar is currently testing the hypothesis that the level of technical-professional culture (a newly developed measure) in the team meetings is higher in balanced teams than in unbalanced teams. Molnar also hypothesizes that unbalanced teams have failed to solve the problems generated by group-functioning. She is currently developing a treatment designed to assist teaching teams with this common problem.

What is the effect of these organizational changes on the learners themselves? Lueders-Salmon (1971) argued that team teaching in the open-space school might well increase the autonomy of the students as well as that of the teachers. She developed a measure of the "Active Classroom" utilizing a systematic observation system, computing four types of movements per child per minute: physical movements directed by the teacher; child-initiated task movements; child-initiated non-task-related movements; and deviant movements (those which drew some sort of negative or controlling response). Table 3 shows quite dramatically that children are much more active overall--and in every specific category--in open-space classrooms. In fact, they are almost twice as active, using Lueders-Salmon's measure. In a related measure of the substantive nature of the children's activity, she found that much more time was spent in "waiting, listening, or passive activity" in self-contained classrooms than in open-space classrooms.

TABLE 3

Physical Movements for Child per Minute  
in Open-Space and Self-Contained Classrooms

Type of Movement	Self-Contained Classroom	Open-Space Classroom
Teacher-directed movement	.023*	.044
Task movement	.062**	.115
Non-task movement	.028**	.060
Deviant movement	.001	.001
Total movement	.114**	.220
Total non-teacher-directed movement	.091**	.176
N (Classrooms)	11	22

\* Difference significant at .05 or less (one-tailed t-test, 31 degrees of freedom).

\*\* Difference significant at .01 or less (one-tailed t-test, 31 degrees of freedom).

In another major line of investigation, Dornbusch and Scott (1971) have been studying evaluation systems in schools. (See also Magnani, 1970; Thompson, 1957; McCauley, 1971; Marram, 1971). Their studies have revealed a general pattern of malfunctioning evaluation systems. When teachers were asked about their ideas as to what kind of information the principal collected about them in order to evaluate their performance on various teaching tasks, high proportions of teachers had no idea. They were also likely to report that they had no idea of the criteria being used by evaluators. Furthermore, in all our studies, teachers in conventionally organized schools report relatively infrequent evaluation or feedback of any kind. In Marram's (1971) comparative study, teachers were much less likely than nurses to see their superiors as having a sound basis for evaluation on central tasks (for teachers, teaching subject matter; for nurses, carrying out doctor's orders).

The necessity for professional development of the teachers became apparent in their responses to questions on the relative weight of formal training, work experience, and personality in helping them teach. Teachers are much less likely than nurses to find that their formal training was helpful (see Table 4).

These studies lend support to a picture of many teachers who lack the training or expertise for a professional approach to teaching tasks. Nevertheless, teachers are given considerable freedom and are not effectively supervised as are more typical bureaucratic employees. In order to remedy this situation, Scott and Dornbusch conceived of a Staff-Line Support Arrangement in which more expert professional help would be brought in to make sure that something more than "personality" comes into play in determining instructional techniques, individualizing treatment, and evaluating outcomes.

Instruments developed in these studies are all included in the plans for collecting data in the projected Longitudinal Study. These measures are itemized in the next section. Thus the studies build one upon each other in the development of new ways to structure teacher roles and in the creation of instruments and propositions concerning the interrelationship of variables.

TABLE 4

Comparison of Teachers' and Nurses' Perceptions of the Importance of Formal Training, Work Experience, and Personality Characteristics

	<u>McCauley Study</u>		<u>Marram Study</u>	
	Teachers	Teachers	Nurses	
How helpful was your formal training (including practice teaching)?				
% Very helpful	40	38	88	
How helpful was your work experience?				
% Very helpful	94	95	99	
In general the personality characteristics of a teacher are more important than any knowledge or set of skills... in determining success in teaching. (Wording modified for nurses.)				
% Agree	78	74	42	

Theory and evidence that this approach will work. The past experience of this program in selecting ongoing schools for key comparison has proved fruitful. There is sufficient experimentation in schools in the area to provide contrasting examples of teacher organization in schools of similar size and with similar clientele. Confidence has been gained in the questionnaire responses on sense of influence reported by teachers because these responses correlated with observed behavior in teams. We have acquired confidence in the methodology of organizational comparison using a combined questionnaire and systematic observational approach.

Propositions concerning the criteria for a rational evaluation system are based on the Scott-Dornbusch theory of authority structure, widely tested on hospitals, factories, universities, and secondary schools (Scott, Dornbusch, & Sagatun, 1971; Dornbusch & Scott, in press). We have considerable confidence that the theoretical framework represents a knowledgeable approach to the problem in light of what past organizational studies have achieved.

How will the program be carried out?

At the present time, three of the four projected components are well under way. The Role of Colleague Groups in Improving Teacher Performance will soon be reaching the point at which its diagnosis and intervention techniques will be ready for experimental evaluation. The Evaluation Model for Differentiated Staffing is undergoing its first revision as a result of its use in a nearby school district. It should be systematically field tested next year. When the materials and instruments have undergone final revision, they will probably be turned over to an organization such as the Far West Regional Laboratory for product development and dissemination. The data from the study of organizational change in higher education are now being analyzed and will be reported in several forms.

The major new undertaking, building on two earlier components, is the Longitudinal Study: Organizational Status of Teachers and Change in Teaching Tasks. In this section, the definition of the major research variables, the research design, the propositions to be tested, and the plan for data collection are specified.

Definition of research variables. In the above text we have been referring to the study of selected innovations in curriculum and instruction. In preparation for this study we have developed a typology of conceptions of the process of teaching tasks. Theoretically, this work is related to the conception of "technology" used by students of organizations. The typology is related to the work on technology by Perrow (1967) and Thompson (1957).

Innovations can be classified along the several dimensions of this

typology. For example, conceptions vary as to the number of dimensions along which children are predicted to vary. Conceptions of task process also vary as to the number of alternative procedures to be considered in prescribing instruction for students. They also differ in the number of steps seen in sequential interdependence; some are seen as lasting over several years of instruction and others comprise a very short unit.

Some of the commercially available innovations would be classified as "high" on almost all of these dimensions. For example, some of the systems of teaching reading prescribe different media approaches for different children. Progress in the component skills is carefully evaluated and is used as the basis for sending the child on to the next type of instruction. The technology requires much diagnosis, evaluation, and problem solving concerning the failure of prescribed approaches for particular children.

The traditional school has conceptions of task process as well. At the simplest level, these conceptions specify "means-ends" relationships. They systematically define success and failure and specify one or more procedures to attain the desired level of success. Traditionally, conceptions of task process in such schools may have mostly to do with routine external criteria such as the age of the child and his grade and ability grouping. Bidwell (1965) refers to the "age-grade placement of students."

This close correspondence of school grades and age grades is not typical of other times and places, suggesting that it arises as school systems become routinized, so that students must be moved through the system in batches and cannot be assigned to school grades individually on the basis of achievement (Bidwell, 1965, p. 975).

These groupings dictate the materials to be used; all children defined as a group receive the same materials at the same pace. Outputs are routinely measured by achievement tests. Regardless of performance on these tests, learners are moved on to the next unit of the prescribed curriculum.

Our schema allows us to divide conceptions of task process into

simple and complex types. Curricular innovations which receive a "high" rating on many dimensions are seen as placing high demands on the teaching staff for diagnosis, evaluation, and professional problem solving. We intend to select particular innovations. Some will register as highly complex on a number of dimensions, thus requiring a high degree of teacher discretion. Some will be complex on a few dimensions, with complex decisions prescribed by the developer of the materials. Lastly, we will select some schools where the conceptions of task process register low on all the dimensions.

Another major research variable in the selection of schools for study is the organization of the teachers in the school. If the teachers are relatively isolated, in their classroom activities, from other organizational personnel, we call the organizational structure a simple one. We are also interested in two complex forms of organization of teachers corresponding to the two organizational models we have evolved. One type of complex structure will be the team-teaching school with a relatively high level of cooperative teaching within teams. The other will be a staff-line arrangement through which experts on curriculum and instruction are used to assist the teacher in carrying out teaching tasks.

The dependent variables will consist of measurements of the evaluation system: teacher reports of influence and autonomy, frequency of teacher interaction with other personnel, teacher job satisfaction, teacher ambition, teacher perceptions of the selected innovation, the way that teachers are actually using the innovation, the professional-technical culture of teacher groups, the effectiveness of teacher group processes, and the social structure of the classroom.

Design of the study. The six-celled design of the study is pictured in Figure 2. Present plans call for the selection of innovations meeting criteria for two kinds of complexity: those calling for a high level of teacher discretion, and those with decisions imbedded in the materials. We will then seek out schools where selected innovations have been introduced--schools with teams, schools with staff-line support arrangements, and schools with simple, conventional organization of teachers.

As a control, we will select schools which are not using complex curricular innovations, but do have organizational innovations involving team teaching or staff-line support arrangements. And we will also examine the operation of simple, undifferentiated teaching task process in all three types of schools.

In the design diagram, the research variables to be measured in schools fitting into each cell are shown. The number-letter code refers to the list of major research variables given in Table 5 and described later in the text.

Propositions to be tested in this study include the basic hypothesis that highly complex innovations will fail to persist in organizations where teachers play traditional isolated roles. The likelihood of the persistence of an innovation is seen as affected by the organization of teachers and by the perceptions of the innovation which teachers hold. The dependent variable of the persistence of an innovation is further complicated by the possibility that the staff may have modified the original innovation, keeping its complex character but making it more suitable for the particular school. This possibility will be measured by the questions on the operation of the teaching task.

Certain cells in this design will be oversampled. We want to oversample schools with highly complex innovations in curriculum and instruction. We also want to oversample schools with complex structures. This gives us a rich opportunity to follow the professional development of teachers over time in the team setting. In the Staff-Line Support Arrangement model, we can follow the ability of staff support to allow the teachers to keep up teaching task evaluation.

Data will be collected from schools in 1972 and again in two years' time. In each wave there will be a "General Sweep" in which teachers and principals are given a questionnaire. In addition, a subsample of schools will be selected from each cell for intensive observation ("Intensive Sweep"). Because of cost limitations, the number of schools where in-depth observational study will be made is limited. In these schools we will measure outcomes of the new teaching tasks by looking at test results among learners, by interviewing children,

Type of Curriculum and Instruction Process

<u>Type of Organizational Structure</u>	1. Simple, undifferentiated process	2. Complex process with decisions prescribed by materials	3. Complex process with high teacher discretion
1. Collaborative Teacher Group	1ABCD <sup>a</sup> 2C 3ABCDE 4A 5B 6AB 7ABCD	1ABCD 2ABD 3ABCDE 4A 5A 6AB 7ABCD	1ABCD 2ABD 3ABCDE 4A 5A 6AB 7ABCD
2. Staff-Line Support Arrangement	1ABCD 2C 3ABCDE 4A 5B 6AB 7ABCD	1ABCD 2ABD 3ABCDE 4A 5A 6AB 7ABCD	1ABCD 2ABD 3ABCDE 4A 5A 6AB 7ABCD
3. Isolated Classroom Teachers	1ABCD 2C 3ABCDE 4A 5B 6B 7ABCD	1ABCD 2ABD 3ABCDE 4A 5A 6B 7ABCD	1ABCD 2ABD 3ABCDE 4A 5A 6B 7ABCD

Figure 2

Variables to be Investigated in Schools with Different Organizational Structure and Different Levels of Complexity of Curriculum and Instruction Process

<sup>a</sup>For number and letter referents, see Table 5.

TABLE 5

List of Major Research Variables  
(to accompany Figure 2)

Major Research Variables--"General Sweep"\*

1. Organizational Characteristics
  - A. Extent of functional interdependence among teachers.
  - B. Complexity of evaluation structure and frequency of evaluation.
  - C. Degree of differentiation of teacher positions (e.g., master teacher, junior teacher, aides).
  - D. Number and type of supporting staff positions (e.g., curriculum experts, advisors).
2. Characteristics of the Curriculum and Instruction Process
  - A. Extent to which innovations are dropped.
  - B. Extent to which innovations are modified to fit the particular situation.
  - C. Degree to which complex process innovations have been independently developed by teachers.
  - D. Degree to which teachers perceive their teaching tasks as complex.
3. Characteristics of Teachers and Teacher Groups
  - A. Teacher background variables.
  - B. Teacher perception of own autonomy in school.
  - C. Teacher perception of own and group's influence.
  - D. Teacher's frequency of interaction with principal and others.
  - E. Teacher job satisfaction.
  - F. Teacher ambition--vertical and professional.

Major Research Variables--"Intensive Sweep"\*

4. Organizational Characteristics
  - A. Observed evaluation structure, complexity and frequency of evaluation.

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\* For a definition of "General Sweep" and "Intensive Sweep," see text, p. IIB-21.

5. Characteristics of the Curriculum and Instruction Process
    - A. Observed extent to which innovations have been modified or dropped.
    - B. Observed extent to which complex process innovations have been developed by teachers.
  6. Characteristics of Teachers and Teacher Groups
    - A. Structure and process of teacher teams (e.g., communication patterns, status structure, extent of collaborative planning).
    - B. Extent of shared technical-professional culture.
  7. Characteristics of Students and Student Groups
    - A. Activity level of classroom.
    - B. Group cohesion.
    - C. Degree of integration of student social structure.
    - D. Student norms toward effort and achievement.
- 

and by systematic observations in the classroom. In the classroom, we have certain hypotheses concerning the effect of complex organization of teachers upon the complexity of the student role. We will also attempt to observe the way the teacher actually handles the decision making demanded by the teaching task. Are the children all doing the same thing? Is there a carefully controlled procedure for arranging different types of treatments for different children? Are the teachers carrying out the specific instructional activities and using the materials described by the developer of the innovation? Are the short-range outcomes in student growth intended by the developer as a consequence of instructional activities and programmed materials observable in the classroom?

If there are teaching teams, a series of teacher team meetings will be videotaped. The tapes will be analyzed with techniques developed by Molnar to estimate their interdependence, their level of group process, and the state of technical-professional culture. This will enable us to test the hypothesis that teams which have already solved group process problems and have developed some technical-professional

culture will be capable of modifying and adapting complex teaching tasks and perhaps will show an ability to invent their own conceptions of teaching and learning.

As to data collection on the second wave, the same schools will be revisited after two years. If possible, intensively-studied schools will have more observations made in the interim. We will then be able to see how the structures have changed, if the technology still persists in the same form, if it has deteriorated, or if it has been adapted and made more complex. We can also examine teacher turnover rates, the deterioration in size of teams, the growth or deterioration of a sense of staff efficacy, and the state of the evaluation of the teaching task. The second wave will again include intensive observations on the same subsample studied in the first wave.

Detailed data on subunits such as teaching teams and from classroom observation should enable us to address questions of the impact of differing conceptions of teaching and learning over time on teachers' and students' classroom behavior and attitudes. We can also see the impact of variation in school structural arrangements over time. The collection of data on individual attitudes toward the innovations will enable us to see how perceptions of organizational participants modify the way innovations are viewed and used. Finally, we will be able to see relationships between organizational changes made after innovations are adopted and the persistence of the innovations in the face of these attempts to adapt the teacher's role.

Intensive study of teaching teams and staff-line support arrangements should allow us to examine the efficacy of these models in producing effective evaluation in connection with complex teaching tasks. We also hope to gain some insight into the potential of a teaching team as a collegial group capable of evaluation of the teaching task.

A Work Schedule, Time Chart, and List of Milestones appear at the end of this Program Description.

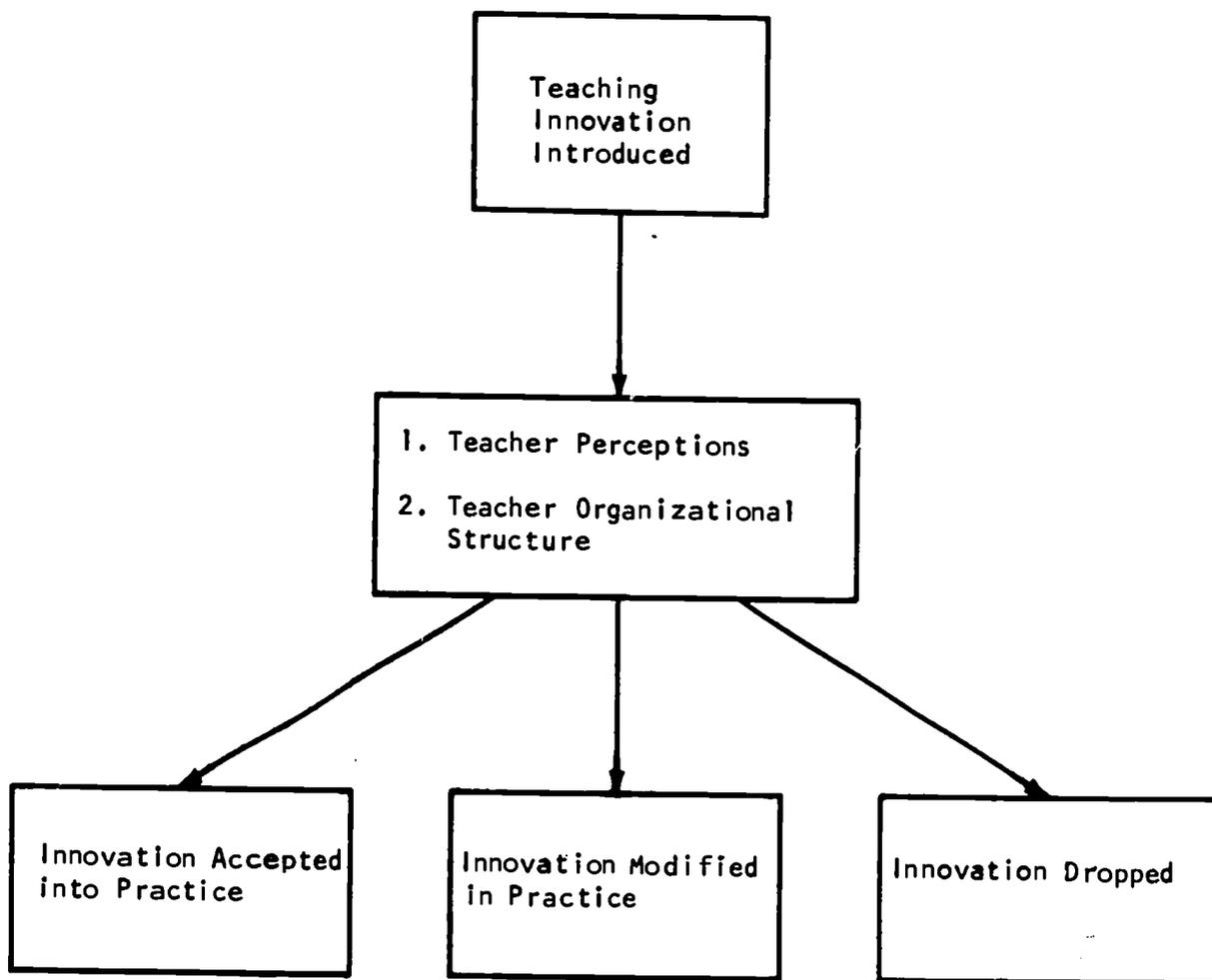


Figure 3  
The Main Problem

How will the program's success be evaluated?

This program will evaluate its success by research methods. In the two development projects, the projected support services for teachers and evaluation model for differentiated staffing will be field tested. Evaluation will be on the basis of whether or not the team operation was assisted in its group process (to be measured by standard methods of assessing group interaction). The efficacy of the evaluation model is to be judged by evidence that administrators have made decisions on the bases of the feedback and have increased progress toward the accomplishment of desired goals. We already have requests for the use of both these developmental products, although they are still in the research stage.

The longitudinal study will be evaluated by the fit of the data to our major propositions. If the data from the first wave indicate serious problems with the theoretical framework, key changes can be made before the second wave. Upon completion of the longitudinal study, we can assess whether there is enough support in the data on organizational changes which will support technological innovation to merit moving ahead with deliberate organizational manipulation in a field experiment.

Who will carry out the program?

This program is fortunate in having a very powerful staff. On the sociological side, we combine strengths in organizational theory provided by Scott and Dornbusch; an expert in longitudinal studies of masses of data involving contextual effects in Meyer; a specialist in small group social psychology in E. Cohen. We are unique in having two full-time Research and Development Associates who represent a combination of professional educational expertise and strong sociological training: Brunetti in administration, school planning, and sociology, and S. Molnar in teacher education and sociology of education. In addition, we have Baldrige who is a specialist in organizational theory. Few other universities in the country could provide these kinds of human resources on a single program staff. Brief personnel resumes are included in Appendix A.

### Relationship to other programs

Our intention to vary the social class and racial composition of students in the schools to be studied involves cooperation with SCRDT Program 3, Teaching Students from Low-Income Areas. Some of the schools in our sample will be ones which that program will also be investigating, and we hope to provide information to that program on organizational and teaching-technique factors important for teacher and learner engagement, as the concept is described in that program's plans.

The Center's Program 1 on Teaching Effectiveness (formerly Heuristic Teaching) is developing a Model Teacher Training System. The program also intends to explore the effects of heuristic teaching on student achievement, problem-solving ability, engagement, aptitude, self-concept, and personal competency. When the program is ready to investigate these learner outcomes as a function of its teacher training model, we hope to help its staff explore variability in the relationship between their model and learner outcomes in different organizational settings. In the meantime, some of the measuring instruments developed in the past will be used to measure reasons for teacher dropout in the longitudinal survey of the Environment program.

The multi-unit school developed by the Wisconsin R&D Center is an example of a new organizational structure designed for an innovative education program. The Center for the Advanced Study of Educational Administration (CASEA) is now planning to study administrative problems of this innovation in multi-unit schools now planned for the West Coast. Our instruments designed to measure effects of organizational change on teachers are slated for inclusion in their study.

### Accomplishments

The products to date of the program as currently conceived are in the form of a series of Technical Reports of the research carried out.

1. Meyer, J. W., Cohen, E. G., Brunetti, F. A., Molnar, S. R., & Lueders-Salmon, E., The impact of the open-space school upon teacher influence and autonomy: The effects of an organizational innovation

(SCRDT Tech. Rept. 21, Oct. 1971) reports the results of a study comparing open-space team-teaching schools with schools that have self-contained classrooms and conventional architecture. Team teachers reported higher job satisfaction and a greater sense of their own influence and autonomy than did teachers in conventional self-contained classroom schools. Professionally ambitious teachers were more likely to be satisfied with teaching in the open-space team-teaching schools than in conventional schools. The decision-making teacher group does seem to have impact on teachers' views of their roles. This study led to further investigation of team teaching, described below.

2. Molnar, S. R., Teachers in teams: Interaction, influence, and autonomy (SCRDT Tech. Rept. 22, Nov. 1971) reports the results of a study combining questionnaire and behavioral observation techniques in investigating different patterns of participation among teaching teams. There were two types of interaction structure in the teaching teams studied: in "balanced" teams all teachers participate equally in the decision-making interaction; in "unbalanced" teams, one or two members tend to dominate the interaction. Teachers on balanced teams are more likely than teachers on unbalanced teams to report that they have influence on team decisions, and that they have control over their own decisions (autonomy). In unbalanced teams, the dominant teachers report more influence over team decisions, more autonomy, and more influence in school decisions than do other team members.

All teachers who reported that their team was highly influential in school decisions were more likely to report that they themselves were individually influential in school decisions, as well as autonomous, than teachers who did not view the team as influential. More than 85% of the teachers who reported that both (1) their team was influential in the school, and (2) they themselves as individuals had influence in team decisions reported that they as individuals were influential in school decisions, and autonomous.

These two studies, combined with one further study by Lueders-Salmon\* comparing children's behavior in open-space team-teaching schools and conventional self-contained classroom schools, led to our conception of the collegial, or collaborative teacher group model of school organization, to be used in the planned longitudinal study described in the Program Description.

3. Two additional reports have led to our conception of the staff-line model of school organization, also to be used in the longitudinal study (see Program Description). These are Marram, G., Dornbusch, S. M., & Scott, W. R., Visibility and soundness of evaluation among teachers and nurses (SCRDT Tech. Rept. ms. due May 1972), and McCauley, B., Dornbusch, S. M., & Scott, W. R., Evaluation and authority in public and alternative schools (SCRDT Tech. Rept. 23, in press).

4. The above reports have been widely requested and disseminated. Requests for research instruments have come from colleagues in many institutions, including another R&D Center and one Regional Laboratory. Our instruments are being used in other research projects, although no results of such studies have as yet been published. Dornbusch and Scott have had requests for their research instruments from Departments of Education in two different states.

The first two studies were also reported in an AERA symposium in 1971, resulting in further requests for our publications. The Canadian journal, Interchange, has requested that we write an article reporting on that work for their special issue on educational innovation. We have also had visits from individuals representing university departments of education in this country, Canada, and England; these individuals have consistently expressed to us the usefulness of our work for their training and research efforts.

5. Other avenues which have been explored in the program have also led to R&D Memoranda and Technical Reports, although the knowledge did not directly influence the direction the program now plans to take. The program components responsible for these products have been or will be phased out.

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\*Lueders-Salmon, Erika. Team teaching and the "active" classroom. SCRDT Tech. Rept., 1972 (ms. in final editing). See also References citation of Lueders-Salmon, 1971.

The reports produced thus far by Component 2D on Organizational Change are:

Baldrige, J. V. Organizational change processes: A bibliography with commentary. SCRDT R&D Memorandum 57, January 1970. (ED 036 908)

Baldrige, J. V. Images of the future and organizational change: The case of New York University. SCRDT R&D Memorandum 58, January 1970. (ED 037 184)

Baldrige, J. V. The analysis of organizational change: A human relations strategy versus a political systems strategy. SCRDT R&D Memorandum 75, September 1971.

Baldrige, J. V. Social science paradigms and the study of complex organizations. SCRDT R&D Memorandum 76, in press.

Baldrige, J. V. Models of university governance: Bureaucratic, collegial, and political. SCRDT R&D Memorandum 77, September 1971.

Baldrige, J. V. Environmental pressure, professional autonomy, and coping strategies in academic organizations. SCRDT R&D Memorandum 78, September 1971.

Stam, J. C., & Baldrige, J. V. The dynamics of conflict on campus: A study of the Stanford April Third movement. SCRDT Tech. Rept. 19, September 1971.

Other relevant reports are:

Edgar, D. E., & Brod, R. L. Professional socialization and teacher autonomy. SCRDT Tech. Rept. 12, August 1970. (ED 046 885)

Meyer, J. W. High school effects on college intentions. SCRDT R&D Memorandum 62, February 1970. (ED 036 907)

Meyer, J. W. The charter: Conditions of diffuse socialization in schools. SCRDT R&D Memorandum 65, May 1970. (ED 049 969)

Lopossa, Barbara D. A comparative study of team and individual decision making. SCRDT Tech. Rept. 20, in press.

Other reports, from earlier projects now phased out, scheduled for ms. delivery in 1972 include a summary of earlier studies of organizational change by K. E. Knight, W. P. Gorth, and others, and a case history of an elementary school from an anthropological point of view by R. L. Warren.

Work Schedule

Part of the first wave questionnaires for the longitudinal study will go out in April 1972 and will be returned by June 1972 (Chart 2A1-1 and Milestone 3). Analysis of this questionnaire data will take place during Summer 1972, resulting in final instrument revision for first wave data (Chart 2A1,2-2, and Milestone 8). The first wave of the intensive observation, part 1, will also begin in 1972 and continue through June 1972 (Chart 2A2-1 and Milestone 4). Part 2 of the first wave data from the questionnaires will continue during the October 1972-March 1973 period (Chart 2A1-3 and Milestone 10), along with part 2 of the first wave of intensive observation (Chart 2A2-3 and Milestone 11). The processing and analysis of the intensive study and questionnaire data, wave 1, will take place between March 1973 and March 1974 (Chart 2A1,2-4), resulting in decisions as to how the second wave effort should proceed and what instrument modification should occur (Milestone 13). First drafts of technical reports of first wave data should also be ready by March 1974 (Milestone 12).

Second wave questionnaires will go out in April 1974 and should be returned by June 1974 (Chart 2A1-5 and Milestone 15). The second wave intensive observation will also be carried out between April and June 1974 (Chart 2A2-5 and Milestone 16). Processing and analysis of second wave data will be carried out from June 1974 through September 1975 (Chart 2A1,2-6), resulting in two technical reports (Milestones 17 and 18). The analysis of this two-part longitudinal study will provide the basis for making decisions about proceeding with field experiments in organizational structure, technology, and consequences for teachers and learners, in December 1975 (Milestone 20).

The decision as to whether and how to proceed with such field experiments will also be based on the results of the work of two other program components. The experiments would rely in part on providing collaborative teacher groups in collegial organizations with the skills they need to function interdependently and to use and create technology effectively.

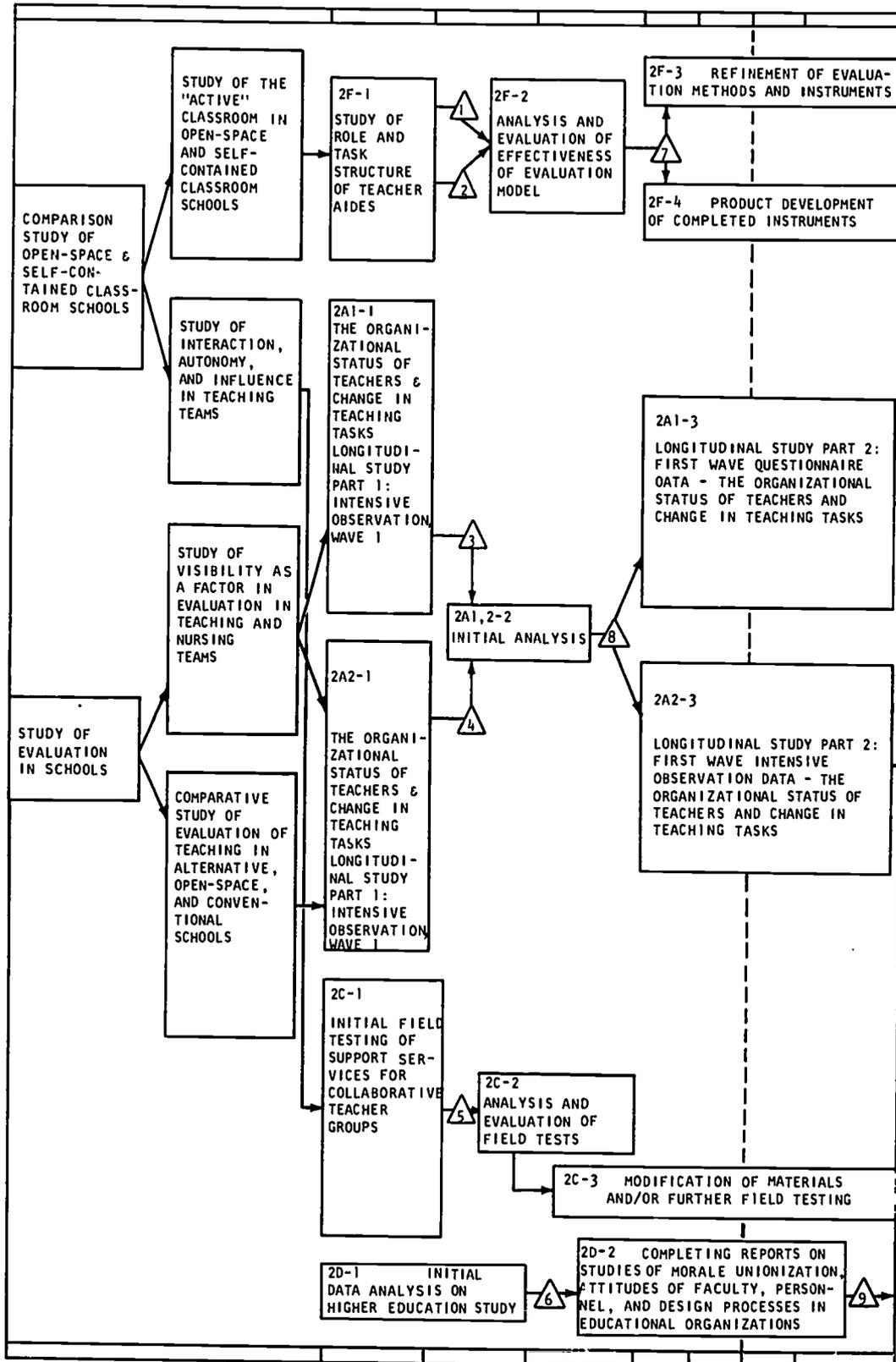
Support services are now being developed (Component 2C), and initial field tests will begin in April 1972 (Chart 2C-1 and Milestone 5). The analysis and evaluation of these field tests (Chart 2C-2) will result in modification of materials and instruments and possibly in further field tests to be completed by June 1973 (Chart 2C-3). Certain instruments developed in this component will also be used in waves 1 and 2 of the intensive observation study (Chart 2A1,2-3 through 5). Experiments with the functioning of collaborative teacher groups, such as teaching teams, will begin in September 1973 (Chart 2C-4) and should be completed by June 1974 (Milestone 14). The analysis and evaluation of these experiments (Chart 2C-5) should be completed, and the experimental materials in their final form in time for use in the organizational field experiments which would begin in 1976. The support service experiments in 1973-74 will also result in a technical report in 1975 (Milestone 19).

Another component which will contribute to the eventual field experimental work is the model evaluation system for differentiated staffing (Component 2F). Studies of task organization and individualized instruction in classrooms with teacher aides, the role and task structure of teacher aides (Chart 2F-1), to be completed in June 1972 (Milestones 1 and 2), will be analyzed during July 1972 through September 1972 (Chart 2F-2), resulting in decisions regarding further activities (Milestone 7). Two types of activities will be carried out: the refinement of evaluation methods and instruments (Chart 2F-3), to be completed by June 1974, and the development into products of instruments and evaluation methods as they reach final form (Chart 2F-4). These instruments, products, and methods will enable the field experiments to incorporate appropriate processes and evaluation methods for the staff-line organizational model.

The fourth component (2D), which has completed two questionnaire waves of a cross-sectional study of a national sample of higher education institutions, is now working on analysis of the data collected on over 9,000 teachers in junior colleges, four-year colleges, and universities (Chart 2D-1). Data analysis is scheduled for completion by August 1972 (Milestone 6). Writing of reports on these analyses

(Chart 2D-2) is scheduled for completion by February 1973 (Milestone 9), at which time a decision will be made regarding further activities (Chart 2D-3). These will include writing one and possibly two research memoranda, to be completed by the time the component is phased out in September 1974.

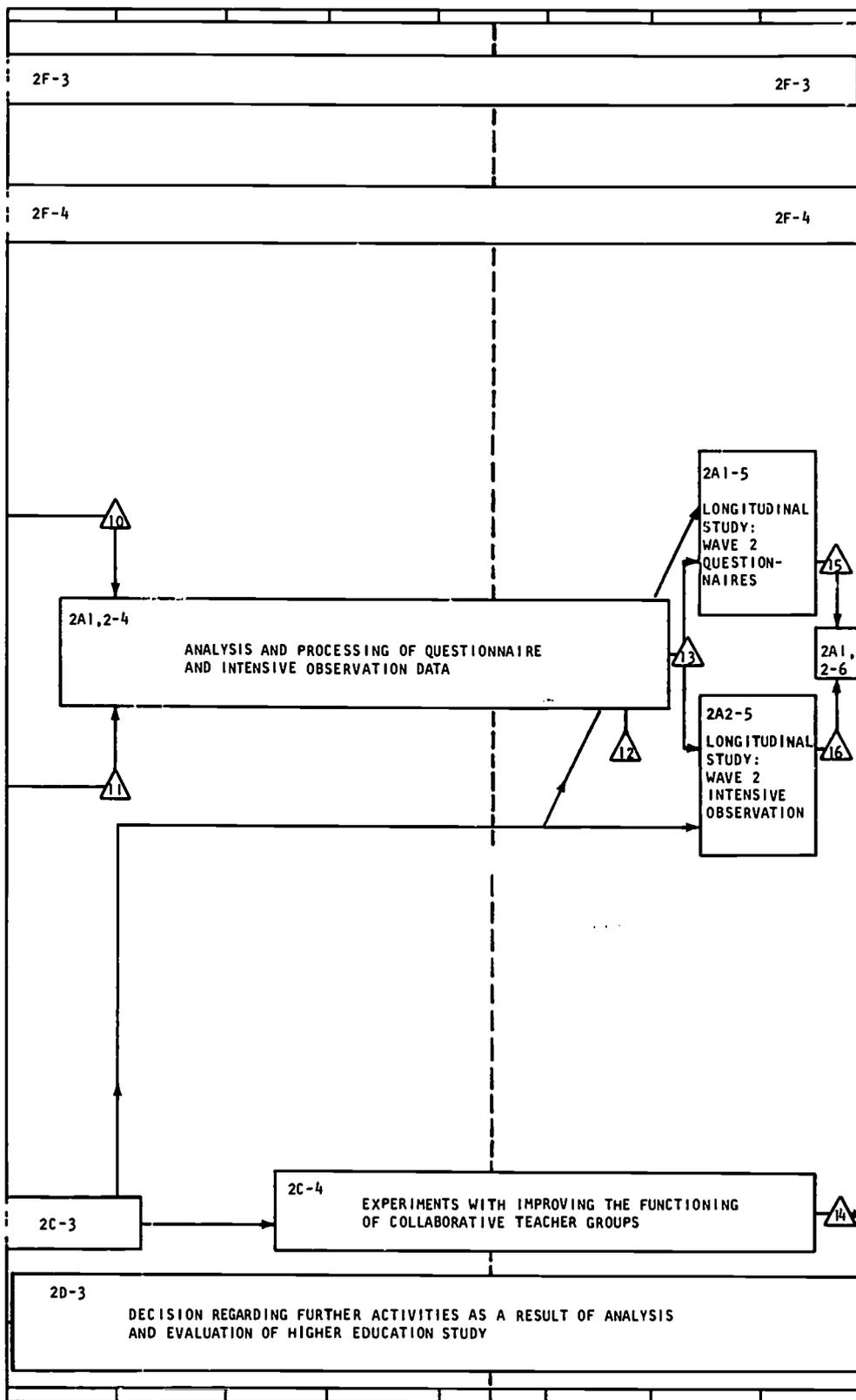
TIME CHART: PROGRAM 2 (ENVIRONMENT FOR TEACHING)



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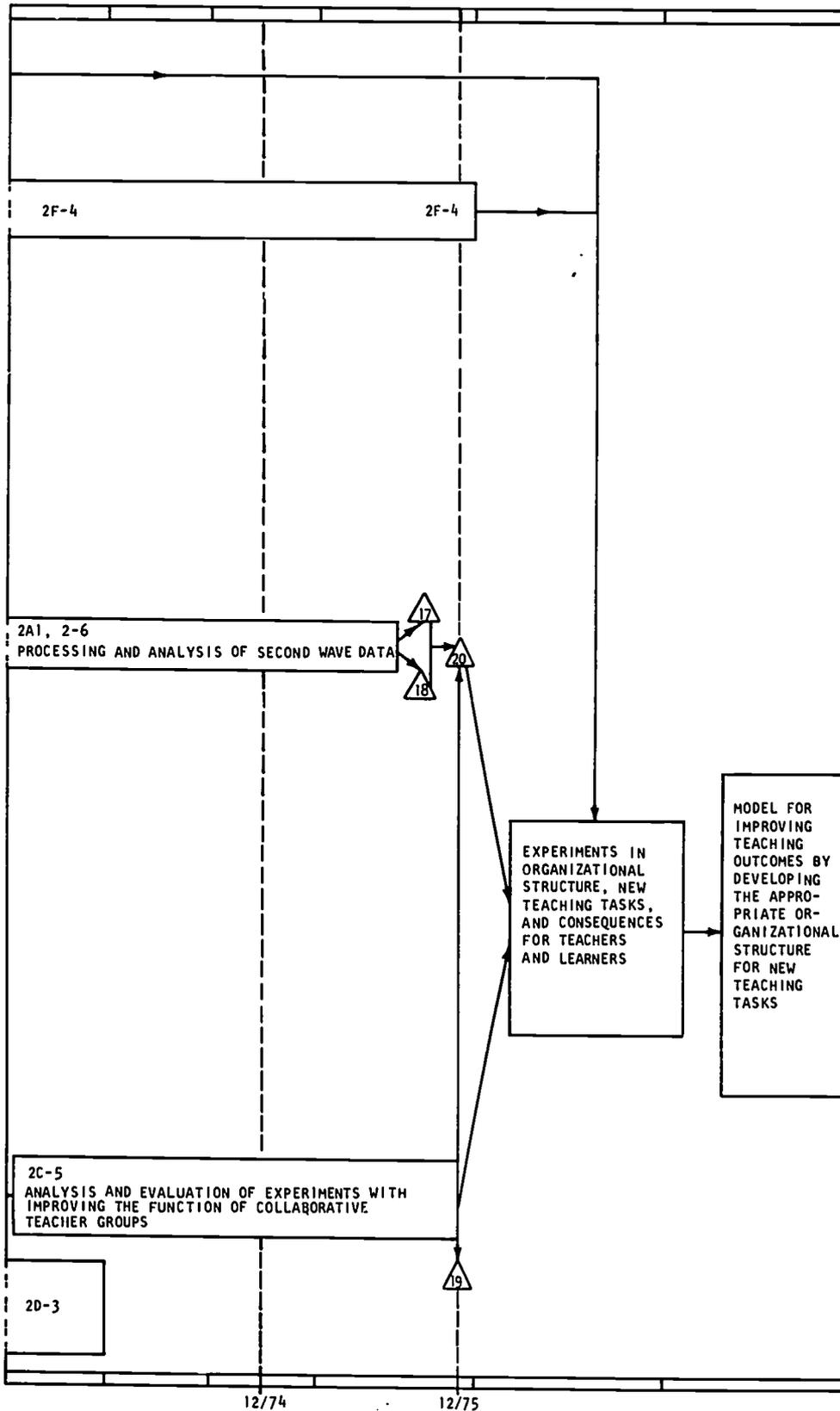
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TIME CHART: PROGRAM 2, ENVIRONMENT FOR TEACHING (CONT'D.)



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TIME CHART: PROGRAM 2, ENVIRONMENT FOR TEACHING (CONT'D.)



Key to Milestones for Time Chart,  
Program 2 (Environment for Teaching)

1. Completion of task organization and individualized instruction in classrooms with teacher aides, the role and task structure of teacher aides study (2F-1), June 1972.
2. Same as above.
3. Return of first wave questionnaires, part 1 of longitudinal study (2A1-1), June 1972.
4. Completion of first wave of intensive observation, part 1 of longitudinal study (2A2-1), June 1972.
5. Completion of initial field testing of support services for collaborative teacher groups (2C-1), July 1972.
6. Completion of initial data analysis on higher education studies (2D-1), August 1972.
7. Decision regarding further activities as a result of analysis and evaluation of effectiveness of evaluation model (2F-2), September 1972.
8. Completion of final instrument revision on longitudinal study, part 1 (2A1,2-2), September 1972.
9. Reports on morale, unionization, attitudes of faculty personnel, and design processes in educational organizations (2D-2), February 1973.
10. Completion of first wave questionnaire data from longitudinal study, part 2 (2A1-3), March 1973.
11. Completion of first wave intensive observation data from longitudinal study, part 2 (2A2-3), March 1973.
12. Completion of drafts of technical reports on first wave data (2A1,2-4), March 1974.
13. Decision as to how second wave effort should proceed and which instrument modification should occur (2A1,2-4), March 1974.
14. Completion of experiments with the functioning of collaborative teacher groups (2C-4), June 1974.
15. Completion of second wave questionnaires from longitudinal study (2A1-5), June 1974.

16. Completion of second wave of intensive observation from longitudinal study (2A2-5), June 1974.
17. Completion of drafts of technical report on second wave data (2A1,2-6), September 1975.
18. Completion of drafts of technical report on second wave data (2A1,2-6), September 1975.
19. Completion of drafts for technical report on support services experiments (2C-5), December 1975.
20. Decisions about proceeding with field experiments in organization structure, technology, and consequences for teachers and learners, in December 1975.

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IIC. PROGRAM DESCRIPTION

Program 3, Teaching Students from Low-Income Areas

## IIC. TEACHING STUDENTS FROM LOW-INCOME AREAS

Program DescriptionWhat problem will the program attack?

This program is designed to study conditions which affect the motivation (engagement) of students and teachers in schools in low-income areas. Our work is concerned with both student engagement and teacher engagement, although these are somewhat different processes. Our interest in questions of motivation is based on the premise that the environments in which learning and teaching take place in low-income schools create motivational problems so severe that even the best instructional methods and curricula may have limited impact.

In the past ten years, a great deal of attention has been given to developing new instructional products and techniques for students in low-income areas. Less attention has been given to understanding the conditions which increase the motivation of students and teachers. The resources of this program are directed toward helping teachers and school administrators create educational environments in which instruction and learning can be more effective.

A primary source of information about the effectiveness of teachers in low-income schools will be observations of competencies the teachers themselves have developed in the classroom. This approach, which is basic to the design of our program, involves a reciprocal collaboration of research staffs and teachers in the schools.

The term "engagement behavior" will be used in this Program Description to refer to a cluster of theoretical constructs under investigation:

1. Student engagement.
  - a. Attention in at least one sensory channel to the teacher or task as defined by the teacher.
  - b. Active attention and effort toward solution of a problem or completion of a task.
  - c. Positive affective orientation toward the teacher and school.

2. Teacher engagement.

The effort a teacher expends which is over and beyond that "expected" or required for him\* to remain in the system. Of particular interest is the extra effort a teacher directs toward reducing the disparity between what he would like to accomplish and his actual success. The extra effort required to plan and implement innovation is an important subset of teacher engagement behavior.

Engagement is closely related to the theoretical concepts developed during the early and middle 1960's, when innovative educational programs for disadvantaged children were under development across the nation. Hunt's (1961) and Bruner's (1962) writings emphasized the importance of constructing educational settings which promote the development of intrinsic motivation to enhance the child's independent problem-solving skills. In later writings, Hunt (1969) argued that disadvantaged children will show the greatest increases in cognitive and social development in educational settings that are intrinsically motivating. The concepts developed by these psychologists are not identical with the constructs studied in this program, because we are concerned with the influences of both intrinsic and extrinsic motivation on engagement. However, Bruner's and Hunt's concerns with the attention-getting and novelty features of stimuli are closely related to our interest in studying stimulus properties that can promote high levels of engagement.

We assume that engagement is related to academic achievement. This assumption is supported by several recent studies (Cobb, 1972; Lahaderne, 1968; Meyers et al., 1968). Our focus on the identification of conditions provided by social context, the teacher, and his behavior, has promise for successful intervention to increase teaching and learning possibilities in low-income schools.

Our central theoretical position is based on two somewhat different lines of conceptual analysis. The first has to do with the response of students to the incentive systems of special educational contexts.

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\*Throughout this Program Description, the traditional use of the masculine pronoun has been employed to avoid undue repetition of the term "the teacher."

In dyadic teaching and learning settings (CAI programs and tutoring sessions), the analysis of student engagement is concerned with (a) the effects of match of level of lesson difficulty (CAI) with level of ability of students, (b) the effects upon engagement of student freedom to select (CAI) type of lesson and level of difficulty, and (c) tutor strategies for arousing and sustaining interest and motivation (engagement).

In the classroom setting, the analysis of student engagement is concerned with the techniques teachers use to arouse the motivation of individual students, small groups, or classrooms. Both types of analyses are related to work on curiosity, arousal, the functions of varied stimuli, the effectiveness of personalization in interactions, the relevance of cultural materials, and the development of motivational contexts (Ausubel, 1968; Berlyne, 1960; Bruner, 1962; Fiske & Maddi, 1961).

Teachers differ greatly in their ability to engage the interest of a class; this talent is especially significant in low-income areas. The use of novelty, of change of pace, of humor, of instruction in the child's native language, of making the material "relevant" to the students' experience, and of other techniques presumably differentiates the teacher successful in establishing rapport. Our observations are designed to study systematically these teaching strategies or techniques.

Other conditions affect engagement. Size of group, ethnic mix, open vs. closed classroom, bilingual instruction, use of aides, use of educational techniques, and other instructional conditions are environmental surroundings which may or may not engage students in educational processes. The CAI setting permits us to vary inputs systematically and experimentally; the classroom permits us to study the expertise of teachers and the effects of settings in field situations.

The second line of theory and analysis relates teacher engagement to the incentives of the educational system in which they work. We assume that teachers have internalized norms for performance in the classroom and in the profession, and that their feelings of self worth and morale depend upon their success in achieving their expectations

for performance. This system, broadly viewed, includes (a) organizational features of the school and the district, (b) the network of interaction with the community through parents and community groups, (c) sources of collegial interaction and support that relate the teacher to his profession, and (d) the response of the students with whom he works in the classroom. These areas represent different types of incentives, and the teacher who is committed to work in a low-income school, we suggest, must derive significant satisfaction from one or more of these areas if he is to remain in a low-income school.

We assume that the larger social as well as educational system in which a teacher works sets the conditions which make teaching either worthwhile or a job to be escaped from--physically or psychologically. The techniques by which the teacher is evaluated, the collegial support, isolation, the organizational features of the school and district, have their own potential rewards and frustrations. These rewards are not random; they are systematically and causally related to the structure and nature of the organization and the larger community in which teaching takes place.

The community may also be a source of gratification or frustration, depending upon the external circumstances and/or the ability of the principal and teacher to relate to the culture of the community in which they work. It is apparent that relationships with community groups may be bitterly frustrating or gratifying; working with parents holds potential as an extension of the teaching task or a nuisance which is tolerated because of funding guidelines. These conditions contribute to the complex network of interactions which make for high levels of teacher engagement or frustration.

Perhaps the most significant rewards come from the students themselves. Teachers appear to seek two general types of gratification: the knowledge that they have been able to help their students learn and perform adequately, and the interest and engagement that suggest that the student's self concept and feelings about school have been enhanced. This last reward is ephemeral, transitory, and may be subject to interruption from any one of a number of sources. Some teachers may turn

to other indicators, such as their ability to keep the class quiet or keep order, but we suspect that these are substitutes for failure to teach the children or to relate to them in affective and humanistic ways.

The concepts of goal setting and attainment (Feather, 1966, 1967, 1969) provide the hypothesis that "exit behaviors" of teachers (requests for transfer, apathy, resignation) are consequences of feelings of failure and frustration at not achieving goals they have set for themselves.

Teaching in low-income schools is conceptualized as a situation in which the teacher is striving to achieve educational and professional goals under conditions which make their achievement problematic. A disparity is thus created between the goals the teacher would like to reach and what appears to be possible given his particular set of circumstances. The adaptations that teachers make to the possibility of failure to train students, to negative evaluations by parents and administrators, and to organizational unresponsiveness are related to theory and research in risk-taking, goal-setting and attainment, and attribution of causality (locus of blame) for nonachievement.

To summarize, the research aspects of our components concentrate upon three settings of educational concern as they are found in low-income areas:

1. Dyadic instructional situations: CAI programs and tutoring sessions
2. The teacher and his classroom
3. The school and community

Within these settings, we are concerned with the effect of the following categories of educational environments upon teacher and student engagement and ethnic self-esteem:

1. Human vs. machine (CAI) teachers
2. Teacher techniques and strategies
3. Different ethnic mixes in student populations
4. Different socioeconomic mixes in student populations
5. Instruction in small vs. large groups

6. Bilingual programs
7. Socioeconomic levels of the school area

Our developmental work is centered upon the following activities:

1. Developing a test of Black English and examining the effectiveness of this test in changing teachers' attitudes toward children from bidialectal homes.
2. Field testing a tutor training manual (Guidebook for Tutors, Cohen, Dickson and Kirk) which was developed in the past year in collaboration with members of the Stanford University Committee on Linguistics.
3. Developing a tutor training videotape program.
4. Developing methods for helping teachers acquire effective strategies for engaging students, and preparing a training element based on these techniques.
5. Developing methods for helping teachers create educational environments and contexts which will increase the levels of engagement of their students.
6. Developing a system for monitoring factors related to teacher turnover in low-income areas.
7. Developing a set of materials which will help principals and other school administrators increase teacher engagement in low-income schools.
8. Developing a program for in-service training of teacher and aide teams.

Earlier research and development work is summarized in the later section on accomplishments of the program.

What overall strategy will be used to achieve the desired results?

The program has two related strategies: a research approach and a developmental approach. Both are based on the concept of reciprocity between the research staff and the schools.

Our research strategy is derived from the assumption that many teachers in low-income schools develop competence in engaging students and in dealing with problems of the system as a result of their experience

and the resources they bring to the task. CAI programs are also effective in engaging students. However we may define engagement from theory or laboratory experiments, the effective competence to engage students is to be found in the classroom and school. It is clear that teachers in our study differ greatly in their ability to engage students (Table 1, p. IIC-12). Our strategy is to observe systematically and in a conceptual framework both the successful behavior of teachers and the factors which make CAI engaging. Our criteria for effectiveness are the evidences of student and teacher engagement that we observe. In a sense, it is our task to gather, study, describe, and prepare for dissemination the competence that already exists.

In implementing this strategy we use naturalistic observation, experimentation, and other techniques of research familiar to the field. The contributions we make emerge from a combination of the research competence of the Center staff and the teaching competence of the teachers and other school personnel.

In a complementary fashion, the developmental strategy we have adopted assumes that those who will use our research results and training materials are the school personnel themselves. A teaching innovation, no matter how effective in the laboratory or in artificial field tests, will not be effective unless it is acceptable and intuitively useful to the teacher or principal. Validation of clinical judgment by the potential user is a basic prerequisite to further evaluation. If the results do not ring true for teachers with experience, they are not likely to be accepted or effective.

Our initial step in the developmental strategy, then, is to report the results of our work to the teachers who have cooperated with us in the research itself. Their assessment is based on their accumulated knowledge of what happens and can happen in a classroom. Their judgment is invaluable with respect to the veracity of our reports and the likelihood that they will appeal to other teachers. Further, more technical, evaluations are feasible if the initial feedback demonstrates that we have results and procedures which will help teachers deal with the problems of engaging students and coping with difficulties in low-

income schools.

This general approach is oriented to the school and the teachers as a part of a total delivery system in the educational process, and as such emphasizes in-service training. The innovations, refined curricula, and other educational experiences and materials are offered to the child through the teacher, the educational environment, and the school administration. If these parts of the delivery system are not effective in orienting the student to the curriculum or providing him with experience that will produce learning, the total system has not succeeded. The acceptance by teachers of results which come from the Center is therefore regarded as an essential phase of our research and developmental task.

The task of the staff is thus seen as a part of a more dynamic and reciprocal relationship between the field (the practitioners) and the Center. Our orientation is one that should mesh effectively with the philosophy and activities of the Educational Renewal Sites proposed by the U.S. Office of Education. Initial discussions have already begun with USOE officials about the feasibility of relating our work to the training activities in these new sites. The principal contact to date has been through the Urban/Rural School Development Institute, an Affiliated Project of the Center.\*

Specifically, how will the program be carried out?

The program staff has been working toward our goals in several interrelated ways:

1. Analysis of language and of bilingual programs in low-income Black and Mexican-American schools and of the extent to which teacher attitudes can be altered by a greater understanding of the cultural meaning of language differences.
2. Studies of motivating and engaging aspects of CAI and tutorial instruction.
3. Longitudinal studies of engagement techniques teachers use in natural classrooms.

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\* For a description of the Urban/Rural School Development Institute, see Appendix B.

4. Studies of the effects of different instructional contexts (e.g., size of instructional group, ethnic mix) on student engagement.

5. Case study of teacher engagement and morale in low-income schools.

6. Survey of relationships between school and teacher characteristics and teacher turnover (exit behaviors) in low-income areas.

In more detail, the program activities and their interrelationship are as follows:

Language component.

1. Procedures and instruments are being developed to help teachers understand differences between Black dialects and standard English, and to acquire an awareness of the linguistic complexity and rules of Black dialects. An instrument for assessing students' linguistic competence is in the developmental stage. Standardization, using techniques worked out by Lambert (1961), is under way. Evaluation of the instrument's impact on teacher attitudes (through their greater appreciation of Black dialects) and upon student engagement in their classrooms will be part of this development and evaluation period.

2. A study of the effect of bilingual programs upon achievement and upon engagement levels of students follows from the work that Professor Politzer has pioneered in the area of bilingual education. This evaluation of bilingual programs will examine the effect of bilingual curricula upon levels of student engagement and student achievement and upon strategies used by teachers. These will be assessed by instruments from other components of the program. The initial surveys of engagement level will take place within this budget year if funds are available; otherwise, this part of the work will be deferred.

3. Both of the above will draw upon the earlier work of Politzer and Bartley in teaching standard English as a second dialect (see Accomplishments section).

Dyadic teaching component.

1. A central goal of this component is to identify types of tutor strategies which most effectively engage children from low-income groups.

Developmental work is under way on instruments for measuring student engagement and tutor strategies in tutoring situations. The success of these instruments and of our current attempts to develop unobtrusive techniques for videotaping natural tutoring sessions without undue distortion will determine the procedures to be followed in our tutor training project, and enable us to decide whether additional and more experimental work will be carried out in human dyadic teaching situations. The decision point on this activity will probably be reached in late Spring 1972.

2. Field tests are being conducted to determine the usefulness of a tutor training manual which has been developed. A decision will be made before the end of FY 72 as to whether or not videotape materials should be developed to accompany this manual. This work will be accomplished during the current budget year.

3. Experimental work with CAI represents an effort to isolate factors which contribute to levels of engagement in student/machine dyadic situations. This grows out of previous work in this program (Miller & Hess, 1972). The processes under examination at the present time are (a) the effect on student interest of "matching" the level of difficulty of the problem to the student's level of competence, and (b) the effect of the student's free choice of task difficulty levels on levels of student engagement.

Additional experimental work on CAI and tutoring will be planned if the results of these initial analyses of the factors that affect motivation in tutoring and in machine instructional contacts are fruitful. The outcome of these studies will be training programs for tutors and attempts to help teachers understand and utilize technology more effectively in classrooms with low-income students.

#### Student motivation and engagement in the classroom.

1. The central research activity in this component is in the data collection and analysis stage. It began as a study of student engagement levels and techniques that teachers use to stimulate student interest and motivation. Instruments for measuring levels of student engagement have been developed and their reliability established.

Instruments for assessing teacher strategies were based on relevant theories and research as well as on interviews and our classroom observations. The teacher observation instrument includes categories such as the use of novelty, personalizing interaction style, humor, feedback, and making material or instruction relevant to the students' background. Observations have been made at four different times in 24 classrooms during the 1971-72 school year; the fifth observation will be made this spring. Preliminary analysis indicates that teachers who are relatively "high engagers" use different strategies and styles than those who are "low engagers" (see Table 1 and Figure 1).

The instruments were also designed to permit analysis of several situational (environmental) variables. Although the initial aim of our research was to identify the relationship between teacher behavior and student engagement, preliminary analysis indicates that variables other than the teacher's behavior account for a great deal of the variance in the student engagement scores. Levels of engagement vary by ethnicity of student (Figure 2) and by the instructional setting (large group vs. small group vs. dyadic teaching) (Figure 3). Additional analyses are under way to determine how the subject matter being taught at the time of observation affects level of engagement.

The study of teaching strategies will be continued through FY 1973. During that year, a decision point will be reached as to whether to continue this line of analysis or to allocate resources to the study of other variables, such as teacher selection.

Along with the study of the effectiveness of specific teacher strategies, we are examining the effects of certain aspects of the educational environment on both teacher strategies and student engagement. Initially our analyses will deal with group size, ethnicity and subject matter. They will be extended to include other environmental variables such as (a) open versus closed classrooms, (b) ethnic mix of classrooms, and (c) teacher/aide teams as they affect teaching and learning in the classrooms.

The developmental activities of this component will be expanded during the next two or three fiscal years. Together with the focus

TABLE 1

Summary of Difference Between Frequency of High Student Engagement  
and Disengagement Across Three Observational Rounds  
(Preliminary Analysis)<sup>a</sup>

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Teacher Identification Number	Engagement-Disengagement Difference <sup>b</sup>
14	+4.7
1	+1.7
13	-1.0
10	-1.7
21	-3.0
8	-3.2
3	-3.3
9	-4.0
19	-4.7
7	-7.7
11	-8.2
4	-8.7
18	-10.0
17	-10.0
2	-10.0
24	-11.0
16	-14.0
22	-14.0
12	-15.0
20	-20.0
5	-20.7
23	-21.0
15	-24.0
6	-28.0

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<sup>a</sup>Final analysis will summarize data on five observational rounds.

<sup>b</sup>Computed as percentage of observational units in which students observed were rated as highly engaged minus percentage of units in which students were rated as disengaged.

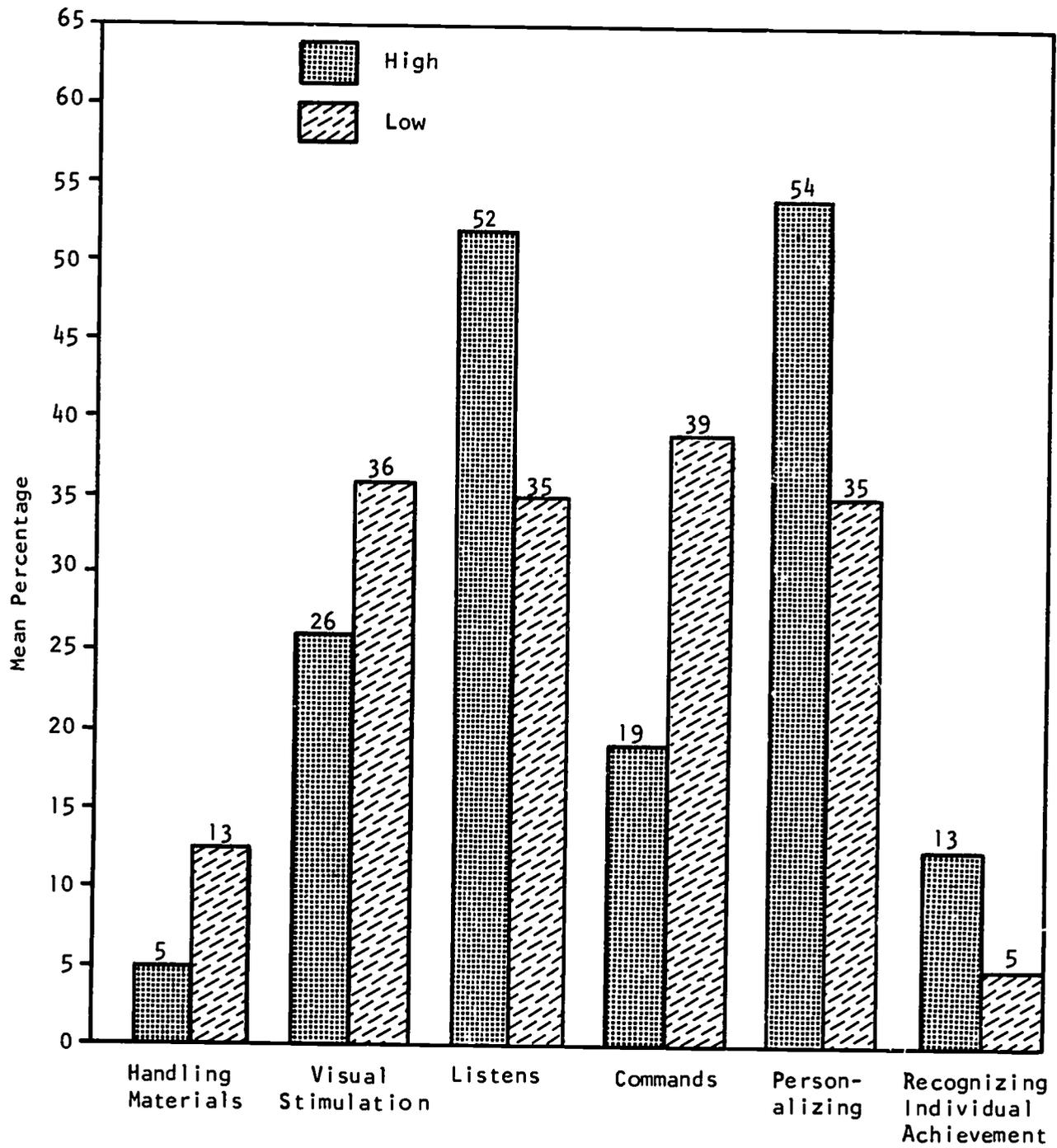


Figure 1

Mean Percentage of Occurrence of Selected Strategies for High and Low Engaging Teachers in Rounds I & II (Preliminary Analysis)

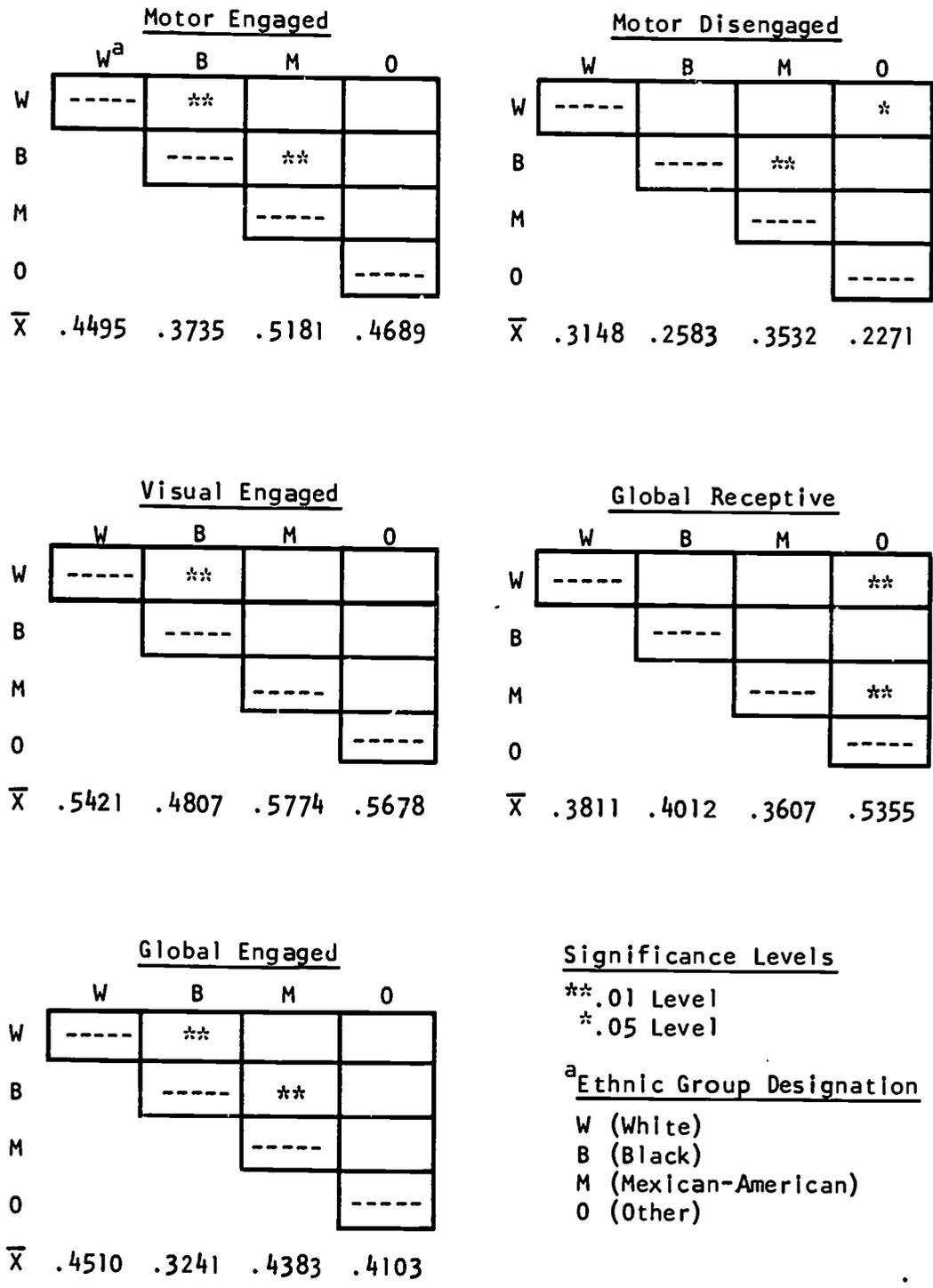


Figure 2  
Ethnic Group Differences in Engagement Behavior: Round 1

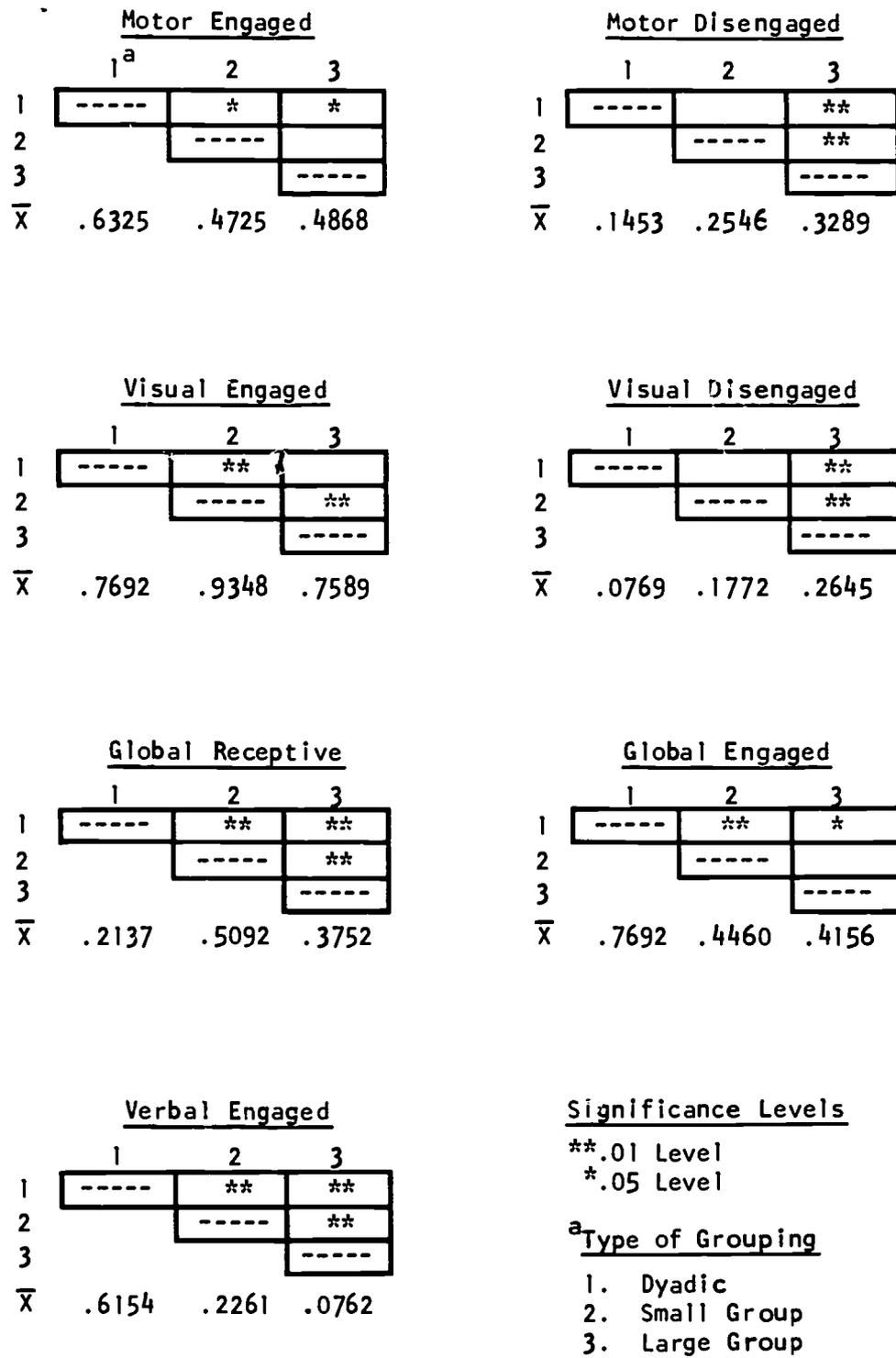


Figure 3

Classroom Grouping and Student Engagement Levels: Round 1

on teacher strategies, and with inputs from Components 3A, 3B, and 3D, they will provide the basis for developing a new training component (Component 3H in Program Register). This training component will have two aspects. One is to assist the teacher in developing his own strategies for engaging students in the classroom; the other is to help the teacher create educational environments which may themselves directly affect the level of student engagement. Conceivably, this effort will include such extra-classroom activities as establishing relationships with parents, modifying patterns of grouping in the classroom, and other situational and social factors. The development of this training program will extend through FY 1975.

In addition to the training program described above, we will develop feedback procedures to teachers participating in the research studies. Twenty-four teachers who have been observed in classrooms on five occasions, beginning in September 1971, will be brought together in a workshop for feedback on both group and individual performance. Presentations of group data will be made, showing levels of student engagement and strategies that teachers have used during the sessions observed by our observer staff. Analysis will be shown of changing levels of engagement and changing strategies (a) during the school year, (b) between different times of the day within each round of observation, and (c) with different ethnic groups and classroom groupings.

The group of teachers will be asked to indicate what they believe to be their own frequency of strategy usage as compared with the observational data.

Subsequently, in individual sessions teachers will be given opportunity to see the data collected on them in their own classrooms, and to elaborate, amplify, and reinterpret the conclusions that the research staff will tentatively offer. They will also be given opportunity to view themselves on videotape, and to discuss with the staff members the observations that they made in relation to our own data.

This workshop will establish a basis for developing future

procedures for providing school systems with specific feedback from research studies.

Teacher engagement in low-income schools.

One component of the program includes a case study of a school which attempts to determine the factors affecting teacher morale and level of engagement. This preliminary study will be completed in 1972. The instruments developed, and the knowledge gained, in this part of the program will be used for more extended studies of teacher engagement and morale. The outcome of these studies should provide principals and other school administrators with more specific information useful in policy planning.

Surveys are also in progress on the rates of requests for transfer or resignation in low-income schools as compared to middle-income schools in two school systems in the Bay Area. Cooperating districts have expressed some willingness to set up a procedure under which such data could be gathered on an annual basis, thus providing the Center, at a very low cost, with a continuing assessment of the trends in teachers' requests for reassignment.

Econometric model of school effectiveness.

The project on Econometric Models of School Effectiveness (3E), directed by Professor Henry Levin, will be completed at the end of FY 1972. After that date he will be devoting his time to work in related fields outside the Center.

Training teacher and aide teams in low-income schools.

A new component, projected to begin in December 1972, will draw on the relevant work of earlier components to provide much needed guidance for helping teachers and aides to work together in such schools. To date, there has been more training of aides in working with teachers than there has been training of teachers to work with aides.

Although the component will not be given its formal separate designation until December, collaboration with an urban school district has already begun. The needs of teachers and aides will be identified with

the help of the district administrators and of teachers and aides themselves. In order to identify and incorporate other relevant findings of the program, representatives of other components are involved in these discussions. Successful patterns of teacher/aide interaction and training will be identified.

The outcome will thus be procedures for selecting teacher aides, training them to perform specific educational functions, training teachers to work with aides, and diagnosing teacher/aide interaction and performance. Appropriate instruments and materials, such as videotapes, CAI programs, and procedures for modeling other teacher/aide teams, will be developed.

How will the program's success, both in general approach and in specific procedures, be evaluated?

The evaluation of each component will consist of two phases: a review of the design and quality of research, and an examination of field applications.

The first phase will concentrate upon determining whether particular measurement instruments are reliable and valid, and whether the research results will yield information about educational factors which can promote high levels of student and teacher engagement. The component staff, program staff, within-Center review panel, and independent review panel meetings will evaluate these aspects of each research component:

1. Component staff meetings are scheduled bi-weekly for discussions about the quality of data collection, methods of data analysis, and the consistency with which research procedures are being implemented.

2. Monthly program staff meetings will concentrate upon evaluating broader aspects of each component's activities. In these meetings the various components' research results will be reviewed and decisions will be reached concerning how these results can facilitate attainment of the overall program goals. In addition, the implications of these research activities for each of the components will be examined.

3. The third stage of the evaluation process will consist of a review panel selected from staff members within the other SCRDT programs. This panel will evaluate research designs, instrument construction, and how the various components are related to components in other programs. This latter evaluation activity will be part of an institutional review of the Center's programs that concentrates upon examining whether significant milestones have been attained by the programs. The major function of this evaluation panel will be to recommend whether each component should continue operating as it was originally constructed or whether changes should be made in research designs, statistical methods of analysis, applications to the field, and the like.

4. The final review panel concerned with research quality will be selected from a group of educational researchers and educators who work outside the Stanford R&D Center. This panel will also examine the relationships among components and between the program and the Center mission, and make recommendations about improving research designs and strengthening the developmental activities.

The second phase of the evaluation process will examine field applications of the program's developmental and knowledge products. This phase will include several types of review:

1. The first level of evaluation is the feedback from our research and development staff. This group will assess the relevance of the findings to their own situation and will critique the research instruments and techniques.

2. Teachers and school administrators will be asked to utilize research information, curriculum guides, etc. derived from the components, and to judge whether these products are useful and if they improve pupil and/or teacher engagement.

3. Materials which pass these two review levels will be moved to a more formal technical stage of small sample field trials. These will be, in effect, pilot studies, using a small number of subjects, initiated to determine whether training programs actually produce changes in pupil and teacher engagement. If the results of these pilot evaluation studies are promising, other products, procedures, or materials will be disseminated in appropriate ways.

Who will carry out the program?

The Low-Income program's various activities are directed by a staff of professional researchers\* who are particularly qualified to conduct research and development in the area of teaching students in low-income schools.

Dr. Robert D. Hess, the Program Director, has worked on problems of education in low-income areas since his graduate study with Allison Davis in Chicago. He has been especially concerned with the effects of cultural and socioeconomic environments upon learning and educational processes. From the beginning of Head Start and other "compensatory" programs, Professor Hess has served as consultant to governmental agencies and projects in the field of educational intervention and has directed several studies himself, as well as serving as director of the Urban Child Center at the University of Chicago.

Dr. Maurice D. Fisher, a full-time Research and Development Associate, directs the research studies in Component 3B and supervises the staff of Component 3C in various aspects of data analysis. His main areas of interest have to do with educational research in early and primary education, educational evaluation of programs with children from low-income areas, and studies of cognitive development in preschool and primary-grade children. His previous work has included evaluating a Title III early education program for children from low-income areas and developing a model for evaluating innovative early childhood and primary education programs.

Dr. Annegret Harnischfeger is director of the program component involving teacher turnover. She is a research psychologist on leave from the Max Planck Institute for Educational Research, Berlin. Dr. Harnischfeger's primary areas of interest and expertise are political socialization, curriculum research and development, educational policy, and psychoanalysis. Her professional activities include a teaching assistantship in sociology of education at the Free University of Berlin, and serving as organizer and administrator for the International Seminar on Learning and the Educational Process, Munich. Her Ph.D. is in Psychology (Education, Criminal Law) from Christian-Albrechts University of Kiel.

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\*Brief personnel resumes are provided in Appendix A.

Professor Robert L. Politzer will continue to direct the component dealing with the role of language in teaching students from low-income areas who also come from homes which are bidialectal, bilingual, or non-English speaking. His areas of specialization have been linguistics, foreign languages, and teaching English as a second language. He has particular strength in developing results of his work for use by teachers in the field. SCRDT R&D Memoranda written by Professor Politzer and Dr. Diana E. Bartley were utilized successfully in an Adult Basic Education Institute at the University of Wisconsin, Milwaukee, in the summer of 1971 and formed the basis of a forthcoming text for teachers of standard English as a second dialect (see Accomplishments section).

In addition to the professional staff, the program has a staff of ten Research Assistants, five from minority backgrounds who bring a diversity of relevant resources to the research studies.

Arnulfo Ramirez is from Texas. His undergraduate degree is in Spanish/English. He has a strong interest in bilingual education and is now working toward a doctorate in this field. Mr. Ramirez's extensive knowledge of both English and Spanish, in addition to his research experience, makes him a valuable resource in the program's dealings with ethnic minorities.

Laird Blackwell's educational background is as follows: A.B., Haverford College, Psychology, 1967; A.M., Pennsylvania State University, Educational Psychology, 1968. Mr. Blackwell's work at Penn State emphasized research methodology and education of low-income children. His later work as a research assistant with David Ausubel at CUNY further involved both these interests. Mr. Blackwell spent three years as an author and evaluator of instructional computer programs, which stimulated his interest in the use of computer-assisted instruction. The effectiveness of teaching strategies in promoting engagement for different student populations in tutorial and CAI situations is part of his broader interest, the incentives for learning provided within different types of educational environments. One important aspect of the differences between "traditional" and "alternative" education may lie in teaching

strategies and accepted behavioral patterns. Consequently, Mr. Blackwell feels that information from tutorial and CAI studies concerning the effectiveness of various strategies for different populations of children could be very useful for proposing and evaluating alternative educational environments.

Mark Everson received his A.B. from Emory University in Atlanta. He majored in psychology (with emphasis on child development). During his last two years at Emory, he worked as an undergraduate research assistant to Dr. Howard Rollins, whose major topic of research was concept formation and perception. He is interested in the education of low-income students and particularly in the influence of education on the child's self-concept and feelings of competence. Further, Mr. Everson is interested in CAI and its use as an educational innovation among minority students.

Ann Bouie took her A.B. in sociology at the University of California--Riverside. Ms. Bouie is concerned primarily with teacher effectiveness as it relates to Black students, i.e., the effect of cultural disparity on teacher-student relationships. Ms. Bouie is an intern in Stanford's Secondary Teacher Education Program (STEP) and is a teacher at Burlingame High School, Burlingame, California.

Kalei Inn was born in China and presently makes her home in Hawaii. This in itself provides Ms. Inn with a cross-cultural reference. Her undergraduate study was at Sarah Lawrence College, where she received her A.B. in the social sciences. Ms. Inn is bilingual and interested specifically in educational problems of Chinese-Americans in urban settings. She is currently in the Sociology of Education program at Stanford. Her dissertation, now in progress, has to do with the effect of desegregation on ethnic self-esteem and sense of "marginality."

Ruby Takanishi Knowles, born in Hawaii, did undergraduate study at Stanford. After taking her A.B. in psychology and humanities there, she received her A.M. in psychology and sociology from the University of Michigan. Ms. Knowles is presently a doctoral student in psychological studies in the School of Education. Her research interests and professional activities include research in teaching and learning in low-income

schools and with different ethnic groups; psychoeducational dimensions of ethnic populations; effects of learning environments, especially structural and organizational variables, on teacher and student behavior; models for research and development work in field settings; research on the involvement of school and community personnel in educational research; early childhood education and its relationship to socializing institutions; and history of compensatory early education programs. She has published several articles in the field of early education for low-income children.

Anne Morton's A.B. was in history and English education. She received an A.M. in counseling from Stanford University and is presently working toward her Ph.D. in child development. Ms. Morton brings a vast resource to the program as a result of being a highly effective teacher in low-income areas and having taught in a considerable range of school systems (Watts in Los Angeles for two years and Athens, Greece for four). She is specifically interested in the effects of changes in teacher strategy on levels of student behavior and engagement. Her dissertation, in progress, is in this area.

Terry Taylor received his A.B. from Stanford University in (developmental) psychology. Mr. Taylor grew up in a relatively isolated rural area heavily populated with American minorities, and consequently has developed an interest in the effects of teachers and teaching upon minority students. He is also interested in determining the effects of student behavior upon teachers (i.e., how students affect change in teacher strategy). In addition, Mr. Taylor is investigating minority student achievement as related to social skills (i.e., the meaning of students' actual test scores as compared or related to peer interaction, reaction toward teachers, authority, etc.).

Diane Schaffer Lucero became involved in research as an undergraduate in psychology at Stanford. Her undergraduate training included work in experimental social psychology. As a graduate student in Stanford's School of Education, Ms. Lucero has participated in various research projects which focused on the problems encountered in low-income, interracial school settings. Her chief interest is in the area of inter-

gration of psychological and sociological perspectives as a resource for field personnel in low-income educational settings. Ms. Lucero is in the psychological studies program at Stanford's School of Education and plans to complete her Ph.D. in June 1973.

Mr. Edmundo Vasquez has extensive experience as a teacher both in the United States and Colombia, South America. He is bilingual and a participating member of the Mexican-American community. His educational experience includes A.B., New Mexico Highlands University (math and biology); A.M., Stanford University (counseling and supervision); foreign language curriculum studies at Brigham Young University; and work in comparative education and sociology at Universidad de Costa Rica, San Jose, Costa Rica. Mr. Vasquez is specifically interested in providing tools which will make our society more sensitive and responsive to others. Investigating teacher commitment and strategies and their effects upon student behavior, in all aspects, will help him achieve his objectives.

Aside from research assistants and project administrators, the program draws upon the resources of experienced teachers who serve as observers and help correlate and record teacher and student activities.

The staff as it is presently constituted will not be adequate to carry out the proposed research studies. An additional full-time Research and Development Associate will be required to direct the in-service training of teacher aides (Component 3H). The staff of Research Assistants will also need to be increased as our scope of work enlarges. We anticipate adding a half-time Research Assistant to the staff of each of the following components: 3A, 3B, and 3D. Component 3H will require three half-time Research Assistants, as well as a full-time nonstudent Research Assistant, to carry out the proposed work.

What is the program's relationship to other programs or to long-range goals of the institution?

The concepts, instruments, and research design of the Low-Income program draw upon both the Teaching Effectiveness and the Environment for Teaching programs in our focus upon a particular type of educational problem. The design of the program has been worked out over the past two years in discussions with other members of the Center, especially the Teaching Effectiveness program staff. The interest of the staff of the Environment for Teaching program in factors which affect teacher performance and the concern of the Teaching Effectiveness staff with student engagement as an outcome of effective teaching are readily adaptable to the more specific problems of education in low-income communities.

At some points there is more direct collaboration. Professor Snow and others of his staff in the Teaching Effectiveness program have studied teaching skills in tutorial situations. Our focus on these dyadic interactions has been on the techniques tutors use to engage students. These interests are clearly complementary, and we have frequent contact between the two activities, including joint staff meetings.

Our plans to work with teacher and aide teams in bilingual schools will utilize work under way in the Environment for Teaching program. Dr. Frank Brunetti and others in this program have been concerned with problems of status and staffing in schools; their work will be directly useful in our own studies of these teams.

If plans for an in-service training program materialize as we hope, there will be more collaboration in applying what we have learned about both engagement and the educational environments which promote it. This collaboration is presently at the planning stage; the engagement projects of the Low-Income program are beginning their second year at the time of this writing, and the results upon which our development plans are based are currently becoming available.

What has the program accomplished to date?

The present program on Teaching Students from Low-Income Areas has grown out of a previous cluster of projects oriented toward teachers

of disadvantaged students. The present program has roots in some of the projects carried out earlier; its more explicit formation has developed within the past year and a half.

Two studies which predate the present phase of the program have influenced its direction and are represented in components now in progress. One of these is the work of Robert L. Politzer on teaching standard English as a second dialect and on teaching in bilingual schools. His emphasis has been on the need to help teachers recognize that different dialects are not merely examples of poor grammar, and that bilingual education may have impacts upon the self-esteem and self-concepts of students as well as upon their academic achievement. His present work (3A) is a continuation of these earlier projects, and the new study of the impact of the proportion of ethnic mix of Chinese children upon their attitudes toward their own language\* is another outgrowth of his work and that of other projects in the program.

The other set of studies which led to the present focus of the program was the investigation of the socioaffective outcomes of CAI with low-income students (Hess et al., 1970). This project disclosed the confidence that students from low-income areas have in the "fairness" and neutral affect of CAI and suggested that CAI might be especially appropriate for children from ethnic and low-income backgrounds. Another aspect of this study was the observation that children from low-income areas were highly motivated to work on CAI lessons and were eager to study with the console. An outgrowth of this observation has been a pilot study by Miller and Hess (1972) of the effect of match of lesson difficulty upon student engagement in CAI. Both these lines of inquiry are carried forward in Component 3B, and the study of human tutor behavior grew out of an interest in the differences in strategy that might be displayed by a human as contrasted with a machine instructor.

Other studies of the role of CAI include an examination of the effect of CAI experience on measures of self-concept (a relationship not clearly demonstrated); the place of CAI in the authority structure of the school and its status in relation to the teacher (the teacher appears

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\*This study is located in Component 3C but has relevance for Component 3A.

to lose prestige and status in comparison with the computer); and a study still under way of the effects of information about the operation of a computer upon the students' feelings of high regard and expertise about the machine. It was this set of studies that brought into salience for the program the role of engagement and the extent to which students who were assumed to be difficult to interest in school tasks could be highly engaged given appropriate conditions.

The present phase of the program has moved past the instrument development phase into data-gathering activities. Initial analyses of data are being used to allocate resources and plan for future work. The status of the several components is indicated in the Component Resumes and elsewhere in this Program Description. A bibliography of significant publications of the program follows.

#### SCRDT Technical Reports

Brod, R. L. The computer as an authority figure: Some effects of CAI on student perception of teacher authority. In preparation, projected for May 1972.

Heath, R. W. The ability of white teachers to relate to black students and to white students. No. 10, February 1970. (ED 037 399)

Hess, R. D., & Tenezakis, M. D. The computer as a socializing agent: Some socioaffective outcomes of CAI. No. 13, October 1970. (ED 044 942)

Politzer, R. L. Practice-centered teacher training: French. No. 1, 1966. (ED 011 934)

Politzer, R. L. Performance criteria for the foreign language teacher. No. 1A, 1966. (ED 034 733)

Politzer, R. L., & Bartley, D. E. Practice-centered teacher training: Spanish. No. 2, 1967. (ED 013 032)

Politzer, R. L., & Weiss, L. Characteristics and behaviors of the successful foreign language teacher. No. 5, April 1969. (ED 031 124)

SCRDT Research and Development Memoranda

Heath, R. W., & Roy, L. Interviews with seven black high school students. No. 59, December 1969. (ED 037 400)

Heath, R. W., Roy, L., & Mack, D. Evaluation of an E.P.D.A. institute, "Teachers for Multicultural Education." No. 68, July 1970. (ED 046 884)

Hess, R. D., & Smith, I. D. The effects of computer-assisted instruction on student self-concept, locus of control, and level of aspiration. In preparation, projected for April 1972.

Levin, H. M. A new model of school effectiveness. No. 63, May 1970. (ED 040 252)

Levin, H. M. Frontier functions: An econometric approach to the evaluation of educational effectiveness. No. 80, November 1971.

Miller, R., & Hess, R. D. The effect upon students' motivation of fit between student ability and the level of difficulty of CAI programs. In preparation, projected for April 1972.

Politzer, R. L. An exploratory study of the relation of teacher competence and performance to pupil attitudes toward foreign language learning. No. 13, October 1967.

Politzer, R. L. Problems in applying foreign language teaching methods to the teaching of standard English as a second dialect. No. 40, December 1968.

Politzer, R. L. Developmental aspects of the awareness of the standard/nonstandard dialect contrast. No. 72, February 1971. (ED 048 589)

Politzer, R. L., & Bartley, D. E. Standard English and nonstandard dialects: Elements of syntax. No. 54, October 1969. (ED 034 977)

Politzer, R. L., & Bartley, D. E. Teaching standard English as a second dialect: Suggested teaching procedures and sample microlessons. No. 61, March 1970.

Politzer, R. L., & McMahon, S. Auditory discrimination performance of pupils from English- and Spanish-speaking homes. No. 67, July 1970. (ED 050 853)

Roy, L., & Heath, R. W. Interviews with four black parents. No. 37, September 1968.

Books and Instructional Materials

Bartley, D. E., & Politzer, R. L. Practice-centered teacher training: Spanish. Philadelphia: The Center for Curriculum Development, Inc., 1970. 186 pp.

Bartley, D. E., & Politzer, R. L. Practice-centered teacher training: Standard English for speakers of nonstandard dialects. Philadelphia: The Center for Curriculum Development, Inc., in press.

Politzer, R. L. Practice-centered teacher training: French. Philadelphia: The Center for Curriculum Development, Inc., 1970. 165 pp.

Politzer, R. L., & Weiss, L. Improving achievement in foreign language. Philadelphia: The Center for Curriculum Development, Inc., 1970. 77 pp.

Politzer, R. L., & Weiss, L. The successful foreign-language teacher. Philadelphia: The Center for Curriculum Development, Inc., 1970. 93 pp.

Journal Articles, Papers, Chapters in Books

Bartley, D. E. A pilot study of aptitude and attitude factors in language dropout. California Journal of Educational Research, 1969, 20(2), 48-55.

Bartley, D. E. Microteaching: Rationale, procedures and application. Audio-Visual Language Journal, in press.

Hawkinshire, F. B. W. Thoughts and feelings about poverty: A brief summary of two workshops on understanding the underprivileged child. Chicago, Ill.: American Dental Association, 1968. 116 pp.

Hess, R. D. The computer as a socializing agent. Paper presented at the meeting of the American Educational Research Association, Minneapolis, March 1970.

Politzer, R. L. An experiment in the presentation of parallel and contrasting structures. Language Learning, 1968, 18, 35-43.

Politzer, R. L. The role and place of the explanation in the pattern drill. IRAL, 1968, 6, 315-331.

Politzer, R. L. Toward psycholinguistic models of language instruction. Tesol Quarterly, 1968, 2, 151-157.

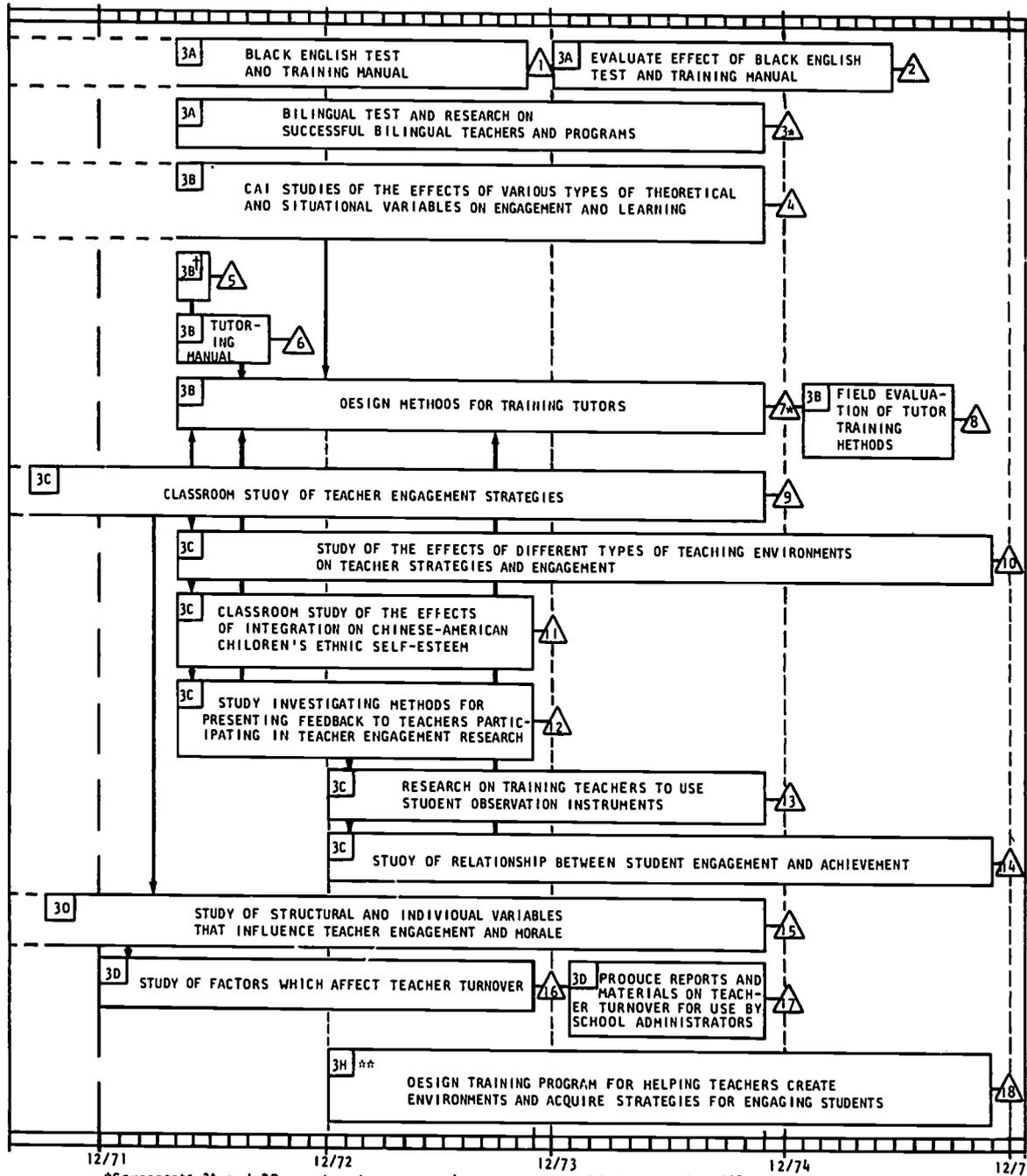
Politzer, R. L. Two schools of linguistics and foreign language teaching. The Modern Language Journal, 1968, 52, 211-213.

Politzer, R. L. Microteaching: A new approach to teacher training and research. Hispania, 1969, 52, 244-247.

Politzer, R. L. Some reflections on "good" and "bad" teaching behaviors. Language Learning, 1970, 20, 31-43.

Politzer, R. L., & Bartley, D. E. Practice-centered teacher training: Standard English as a second dialect. The Modern Language Journal, 1970, 54(1), 31.

TIME CHART: PROGRAM 3 (TEACHING STUDENTS FROM LOW-INCOME AREAS)



\*Components 3A and 3B are based upon previous components which began in 7/68.

\*\*The findings from Components A, B, C, and D will contribute to Component H.

†Component 3B (Milestone 5): TUTORING OBSERVATION INSTRUMENTS

Key to Milestones for Time Chart, Program 3 (Teaching Students from  
Low-Income Areas

1. Completion of Black English test and training manual, November 1973.
2. Completion of report on effect of Black English test and training manual, June 1975.
3. Completion of bilingual test and research on successful bilingual teachers and programs, November 1974. Plan new studies for 1975.
4. Completion of CAI studies of the effects of various types of theoretical and situational variables on engagement and learning, November 1974. Plan new studies for 1975.
5. Completion of tutoring observation instruments, June 1972.
6. Completion of tutoring manual, September 1972.
7. Completion of development of methods for training tutors, November 1974. Plan new studies for 1975.
8. Completion of field evaluation of tutor training methods, September 1975.
9. Completion of classroom study of teacher engagement strategies, November 1974.
10. Completion of study of the effects of different types of teaching environments on teacher strategies and engagement, November 1975.
11. Completion of classroom study of the effects of integration on Chinese-American children's ethnic self-esteem, November 1973.
12. Completion of study investigating methods for presenting feedback to teachers participating in teacher engagement research, November 1973.
13. Completion of research on training teachers to use student observation instruments, November 1974.
14. Completion of study of relationship between student engagement and achievement, November 1975.
15. Completion of study of structural and individual variables that influence teacher engagement and morale, November 1974.
16. Completion of study of factors which affect teacher turnover, November 1973.

17. Completion of reports and materials on teacher turnover for use by school administrators, November 1974.
18. Completion of training program for helping teachers create environments and acquire strategies for engaging students, November 1975.

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### III. INSTITUTIONAL DESCRIPTION

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Introduction

The Stanford Center for Research and Development in Teaching, which began in September 1965, is a well-established and effectively-functioning part of the School of Education at Stanford, and like the School, has strong interdisciplinary roots in other schools and departments in the University. Standards, expectations, and achievements are high. The geographical region, the University, the School, and the Center provide a favorable environment for research and development work in teaching. The Bay Area is a region saturated with imaginative experimental education programs aimed at improving teaching. Stanford similarly is engaged in many important educational projects, for example, computer-assisted instruction, the ERIC Clearinghouse on Educational Media, and such curriculum developments as SMSG. The quality of the School--and indirectly of the Center as the principal research arm of the School--has been recently reported by Professor H. J. Walberg\* of the University of Illinois at Chicago Circle. The following table shows Stanford's superior ranking by a random sample of members of the American Educational Research Association.

Especially noteworthy is that Stanford is ranked highest above other schools in division C of AERA, "Instruction and Learning," which is most closely related to the mission of the Center. A substantial number of the senior Center staff are regular Stanford faculty members, and the bulk of the junior professional staff are from the highly-selected advanced-degree students of the University.

Stability of leadership and direction of the Center is illustrated by the fact that the two persons who were most active in forming the Center have remained with it and continue to give a major portion of their time and energy to it, namely, Dr. N. L. Gage, the Chairman of the

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\*Walberg, Herbert J. "University Distinction in Educational Research," Educational Researcher, Volume 1, No. 1, January 1972, p. 15.

TABLE 1

## Number of Nominations for Distinguished Educational Research

	AERA Divisions						Rank		
	A	B	C	D	EFGH	Total	Ed.	Psy.	Soc.
Stanford	7	10	18	7	2	44	1	1	9.5
Illinois	2	9	13	7	0	31	2	5	14
Harvard	2	8	11	6	3	30	3	4	1.5
Wisconsin	2	3	12	6	2	25	4	6.5	6
Chicago	4	4	6	5	1	20	5	11.5	3
U.C.L.A.	1	7	4	4	2	18	6	8	7
Ohio St.	7	4	3	2	0	16	7	16	18.5
Berkeley	5	1	4	3	0	13	8	3	1.5
Minnesota	1	2	6	0	1	10	9	6.5	9.5
Michigan	3	1	3	0	1	8	11	2	4.5
Teachers Coll.	3	1	2	1	1	8	11	15	4.5
Oregon	6	0	1	1	0	8	11	14	14

Executive Board and Director of the largest program (Teaching Effectiveness), and Dr. R. N. Bush, Director of the Center.

The institution as a whole has shown both flexibility and firmness in pursuing its mission. The decision, planning, and evaluation mechanisms have been sufficiently effective, as a historical reading of annual reports shows, to enable us to move first from a series of relatively isolated projects into more unified domains of inquiry, and now into three significant problem-focused programs related to the overall mission of the Center. The components of each program have each year become more articulated with each other. There is evidence that the programs are moving cumulatively toward findings and products that show promise for the realization of program and mission objectives.

Each of the three programs is strengthened by the presence of the others, and increasingly as each attends to the problem of improving

teaching from its unique perspective, a communality of findings is leading to the pooling of results and efforts.

Each program draws upon a complex of instructional technology, publication, dissemination, methodological, and administrative services (described in detail below) that would be impossible to maintain without an institution such as the Center. These support services and facilities will be greatly extended and enhanced upon the completion of our new facility.

#### Organizational and Operational questions

This seventh is an important year in the life of the Stanford Center for Research and Development in Teaching. It brings to a close the institution's geographical separation from its parent body, the University and the School of Education. It will mark the first year in a physical environment that enhances rather than detracts from the realization of its program goals and efforts to operate in true Center fashion. Each of the Center programs, as may be sensed from reading the description and plans, is entering upon a new, more active developmental stage, in which the fruits of the past several years of theorizing and research will begin to be more fully appreciated in the arena of school operations.

This year should also, in addition to its significant program achievements, be characterized by advances in manner of organization and operations. The Center operated from its beginning in 1965 until 1968 under an organization consisting of an Administrative Board which was composed mainly of members external to the Center staff. In 1968, a new set of Guidelines was adopted with a governing Executive Board consisting mainly of Center staff. A copy of these Guidelines, under which the Center now operates, is provided as Appendix D. They have served us well in building a strong institution. We are now in the midst of discussing the next steps in the evolution of machinery for organization and operation of the Center which we believe will enable us to cope successfully with the difficult but challenging educational

research and development period we are now entering upon, not just at Stanford, but in the country, and indeed internationally. As stated in the original Proposal to establish the Center, it was to be anticipated that the organization would change as the Center developed. Current practice has already outgrown the 1968 Guidelines. We are entering a new era of greater import, challenge, and responsibility as we move into our new facility, and we are accordingly in the process of formulating a new set of guidelines which we intend to be in effect by the time we move to the campus in September 1972.

We are now addressing ourselves to several questions which bear directly on the organization and operation of the Center.

1. How can we strengthen program review? We have not to date achieved a fully satisfactory program review process. The importance of the problem is matched only by its difficulty. Sponsoring agencies, principally the federal government, also appear to be struggling to find better solutions to the review problem. The government has passed along many tortuous routes in evaluating centers and laboratories, and the end is not yet in sight. We too in the Center have been attempting to improve our review mechanisms.

The Center staff has, for understandable reasons, been reluctant to call extensively upon its established Advisory Panel as constituted over the past few years. This has not been because the panel lacks distinguished members who can and do give good advice when they are asked, but rather because of other factors. Many heavy demands upon our busy, creative, and competent R&D personnel beyond their regular Center activities drain their energies and draw them away from doing basic program work. Coupled with this have been excessive governmental reporting requirements, site visits, and other reviews, too often with very short notice, so that we have been reluctant to spend money and time on yet another program review. What is needed most, when the regular time for Advisory Panel meetings draws near, is not still another review, but rather time to do what has already been planned and badly needs doing. Especially does this view prevail when critical budget shortages for operating funds compete with the expenses for review panels.

One difficulty has been that the program advisory services in the past have been conceived of by many program staff members not as something designed by and for them, but rather as still another "outside" interruption. The program review mechanics now under discussion are being designed to overcome some of these past difficulties.

We want to increase review flexibility, especially in timing, so that small groups, both from inside the Center and the University and from outside, can be assembled at critical decision points for the different programs and components. Programs and components need different kinds of advice at different times. This may mean moving away from one Advisory Panel, meeting at a fixed date each year to consider all programs. We still need more and better evaluative discussions of each other's programs. And we need more sustained dialogue between major program personnel and a continuous group of outsiders who are identified as experts in our respective program areas. We have always recognized the necessity for rigorous inside and outside review before taking final action on major program adoption or alteration. But at present we seem to have placed too much burden for both review and action on one group, the Executive Board. Our discussions are now concerned about how to obtain a better division of labor.

2. How can we provide for clearer delineation of policy-making and operational functions? In addition to program review and policy action functions, the Executive Board has also been performing operational functions. Over the past few years, growth in the size and complexity of Center activities and problems seems to have placed too great a burden on the Executive Board, whose members are already overextended in carrying out the substantive and support work of the Center. One difficulty in its work is highlighted by asking the question "What is it that the Executive Board executes?" It has had the dual task of both formulating policy and overseeing, if not also in fact executing, policy. We are considering whether at this stage in Center history, these functions need to be separated. Wise policy making requires time, perspective, and objectivity, as well as hard-headedness. Deliberation should

be based upon the results of thorough discussion and consideration of alternatives by those who have program responsibilities and by outsiders. Major policy decisions should be made by those who, while knowledgeable and competent regarding the work of the Center, are sufficiently removed that they have perspective and cannot be accused of acting solely or primarily from self-interest. This difficulty inevitably arises now when those whose main responsibility is to obtain resources for their respective programs must also make major policy decisions, especially on fiscal matters and new directions. What is the right mix of insiders and outsiders? That is a critical problem which we are considering.

We are considering also how operational matters, which are extensive and highly influential in their implications, might be separated more clearly from policy-making functions than they have been in the past.

3. How can the base of participation in operational functions be extended? We are not fully satisfied with the extent to which all parts of the Center now play an active role in Center operations. On the small Executive Board, the Research and Development Assistants have been represented, but not the full-time R&D Associates--a strange anomaly. Further, most of the support and technical staff have not been represented. We are considering how some type of mechanism can be formed to provide for wider participation of all members in the operation of the Center.

4. How can we strengthen planning and reporting functions? Center planning and reporting functions have been quite decentralized. The large amount of time required for their performance has fallen most heavily on already overburdened program and support staff. We are recommending that a new position of assistant director be added to the staff of the Director to assume substantial responsibility for planning and reporting.

5. How can the relationship of the Center with the parent body, the School of Education, be strengthened and clarified? It seems appropriate to consider relationships with the School of Education as the Center moves into its new on-campus building, which locates it adjacent to the School. The Center is a large and important component of the School.

Its activities extend into other schools and departments and into the field. Where and how does it fit into the School? As we formulate our new Guidelines, we need to refer specifically to the origins of the Center as a result of action taken by the School. We need to state specifically that authority and responsibility for the Center derive from the School and are delegated through the Dean to the Center. The Dean should probably play a more active role in policy matters, and School representation should probably be extended. The Director should be required to report regularly, at least annually, to the faculty.

The School of Education is in the midst of a thorough review of its work. In February, 1971, the faculty recommended to Dean Arthur Coladarci the selection of a committee to consider alternative futures for the School. That committee (one of whose members was a Center Program Director) reported in June, 1971. Under a section entitled "Development of Problem Focuses," they wrote the following:

Faculty in the School have expressed in interviews their desire to cooperate in team ventures which might have an impact on educational practice. Professors and students with different skills but common purposes can gain unity of effort and social influence by focusing together on certain key problems. These we call problem focuses. Such ventures would encourage departures from the individualistic patterns of research and field experience common at the present time and would supplement the structures of interaction provided in the training programs.

A number of faculty members and students have observed that Stanford is not having a sufficient impact on the schools and that single professors cannot mount workable attacks on the complex problems that vex the field....How may a fundamental change in the present individualistic patterns of research and fieldwork be accomplished?...Experience with three major group-based ventures at this School has shown that cooperation is possible and productive: SIDEK, the R&D Center, and the Research Traineeship Programs. Such enterprises have also provided a collaborative base for student support....

Further on in the same section, under a heading "Bringing the R&D Center and the School Together," the committee states:

The collaborative work of faculty members and students in the R&D Center in some ways exemplifies what Problem Focuses are capable of, though its efforts have pointed more toward scholarly study than toward community action. The Center is a great resource, with potential that is not yet utilized.

The Stanford Center for Research and Development in Teaching has enormous potential not only for the field of education, but for the School as well. As a part of the School of Education at Stanford it will expand research facilities, space, and research equipment considerably. For example, the new building will provide an additional 40,000 sq. ft. of usable space and will contain facilities for micro-teaching, videotaping, and study of small group processes, a television and film studio, a language laboratory, and a library....Such resources will enhance the quality of inquiry among the faculty and students in the School.

The Center is mission oriented and needs to have a coherent program. It cannot achieve the goals it has established for itself without a program whose components are carefully coordinated. Students throughout the School in a range of fields of concentration should be able to participate and contribute to the Center's work. To enhance both the operation of the Center and life of the School, the Committee recommends that formal and public procedures be developed whereby faculty interested in conducting research and development under the aegis of the Center can submit proposals for such research and development to a Review Board for consideration. It should be understood that not all proposals would be supported and that a primary criterion would be the degree to which the proposed work fits into the Center's objectives.

The Committee also recommends that one member of the faculty of the School, not connected with the Center formally, be elected by the faculty to the Center's Executive Board.

It is also recommended that openings for research assistants in the Center be advertised publicly in the School so that all students who are interested may apply for such positions. Such a procedure would enhance the opportunities available to graduate students on an equitable basis and could diversify the talents on which the Center could draw.

It is also recommended that each year a presentation by the program directors or director of the Center be made to the faculty describing and assessing the Center's work for that year. Such a presentation would give faculty members an opportunity to learn first hand of the Center's accomplishments and serve to increase the degree of understanding that should exist between those conducting work at the Center and those who are not.

The report also goes into considerable detail, under a heading "Links to Practice," concerning the program in teacher education at Stanford, which the Center has been associated with since its beginning. The necessity for reform in teacher education at Stanford was clearly pointed to by this committee. As a consequence, a special Teacher Education Task Force was appointed and has been hard at work this year to produce recommendations as to the lines of that reform. The R&D Center has made an important contribution to that report, and because of the linkage between

that program and the R&D Center, excerpts from the Task Force Report which discuss research and development in teacher education are presented in Appendix C.

### Personnel

The Center, as part of Stanford University and the School of Education, is able to draw upon an experienced group of personnel management specialists and an established personnel policy (see Guide to Organization Policies and Procedures, Stanford University). Personnel management in the Center is carried out in close cooperation with the University, with particular emphasis given to Stanford's vigorous equal-opportunity employment policies.

The Center's staff is divided into professional and nonprofessional components. The professional staff at the Center, representing nearly 70 percent of the Center's positions, is composed of Research and Development Associates, Research and Development Assistants, and some support service personnel.

Research and Development Associates, the chief investigators in the programs, include faculty members from the School of Education and the Departments of Psychology and Sociology as well as full-time post-doctoral staff members. The ability and dedication of the Center's R&D Associates has been proven in their individual work over the seven years of the Center's life. Beyond their individual efforts, the Associates, interacting among themselves and with other faculty members and researchers in the University, have formed that critical mass necessary to conduct the sustained and effective research and development which will improve teaching in the United States.\*

The R&D Associates are assisted in their work by Research and Development Assistants. The Assistants are typically doctoral students in the University. R&D Assistants are selected on the basis of their academic records, experience, and interest in the programmatic work of the Center. The Assistants are directed in their work by the Associates and are further trained through their University studies. Although Assistants are typically recorded as spending 50 percent of their time with the Center, the blending of their research and studies frequently leads to near full-time devotion to Center work. Stanford grants a tuition rebate worth in

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\*Brief personnel resumes are provided in Appendix A.

excess of \$500 per academic quarter to each R&D Assistant. This is at no direct cost to the Center, and, when coupled with the ability, dedication, and experience of most of the Assistants, makes an R&D Assistant a wise investment of government funds.

The nonprofessional staff at the Center consists of management, technical, and clerical staff members. Because of its close association with the Stanford University personnel office, the Center is able to select from a broad range of highly qualified potential employees attracted to the university environment. Again because of its close association with the School of Education and the University, the Center is able to supplement its full-time support staff by sharing specialists on a part-time basis with other segments of the University. The result has been the development of a well-qualified and stable support staff which can increase research and development effectiveness at minimal cost to the basic contract.

### Support services

The Center provides the following services for the support of its programs:

1. Educational Technology and Information Services
  - a. Computer use in CAI and programmed learning
  - b. Documentation
  - c. Editorial assistance
  - d. Materials production and product packaging
  - e. Publication of technical reports and instruction manuals
  - f. Television, film, and audio production
  - g. Public information and dissemination
  - h. Distribution arrangements
2. Research Methodology Services
  - a. Research design
  - b. Measurement
  - c. Statistical analysis
  - d. Data Interpretation

These support services have been organized to provide assistance to programs at all stages of their work: from the conception of a problem, through its formulation, testing, data processing and interpretation, including design, production, and evaluation of prototype materials and instruments for use in teaching and teacher training.

One unique quality of SCRDT support services results from the fact that individual support staff members have been selected with great care to insure that production members understand research requirements, and similarly, that research support personnel understand development procedures. The high degree of empathy between the research and the production branches of support services which this approach has produced has the further advantage of producing a more aggressive campaign to turn Center research findings into useful prototype materials. As we move into the new Center facility, this team approach to support services will be facilitated by an open-office landscaping design. Until now, support services were physically separated from each other and from the research staff, making constant contact difficult. The continual, informal interaction of research and support personnel will be enhanced by geographical proximity.

The support staff have been aided by the extraordinary resources available in the Stanford University community and in the San Francisco Bay area. A number of respected professionals in the research methodology and development/marketing fields are located near the Center. Support personnel attempt to keep in touch with these individuals, interact with support staff from other agencies within the University, and keep abreast of the growing support facilities at the University which can be made available for educational R&D efforts. Specialists in research methodology, for example, keep in touch with University Computation Center staff and make use of Stanford computing facilities. Media specialists work closely with other University specialists in the Schools of Engineering and Medicine to avoid the added expense of unnecessary equipment duplication. The large number of publishing activities in the University and the surrounding communities are a useful source of information and services for our growing publication efforts.

During the next few years the support services will be entering a new phase in their contribution to the life of the Center. As the Basic Program Plan indicates, the various program components will be drawing more heavily on support services in the development and production of

prototype materials for use in schools. For this reason, research methodology will be giving increased attention to the evaluation and field testing of instruments and instructional procedures. Additional publication section efforts are required for the production of prototype instruction manuals which can be used in field tests and channeled to marketing and distribution agents.

The increased need for instructional technology services will be most obvious in the instructional media areas. We hope to continue building on the well-known success of the microteaching and Minicourse production paradigm of the past. We intend to provide more technological support for this type of media-oriented developmental activity. The excellent new Center building will provide the equipment and instrumentation which is necessary to begin this new support phase. Research Methodology intends to make use of the NOVA computer in the Pyramid-type system for routine data analysis in order to save time and money ordinarily spent on the University computer. Publication of manuals and public information materials will be aided by the acquisition of space and equipment which make prototype duplication possible. Television and film production services will also be extended to prototype production. As our developmental work matures we expect to expand our instructional technology beyond prototype capability. We intend to make a second stage equipment request which will allow us to provide production and dissemination service to Center programs.

In preparation for entry into the new building and a more advanced stage of developmental work, the support staff has been reorganized so as to provide more effective services. Previously, the research methodology, publication and dissemination, and instructional media staffs have been separate units within the Center. Beginning with this Basic Program Plan the publications and instructional media units will be combined and titled: Instructional Technology and Information Services (ITIS). This combination should bring about closer cooperation between publication and instructional media staff to accommodate requests for public information, combinations of print and instructional media materials (e.g., an audio cassette/instruction manual package or a video-tape protocol/printed

instruction package). One member of the research methodology staff will join the ITIS staff to coordinate the use of the Pyramid-type system and promote interaction between research methodology and the various Center programs.

With this reorganization, the support services of the Center now move into a central and even more important role as we prepare to enter a new physical facility with greatly increased capabilities and to reach a new developmental stage in the progress of the Center.

#### Relationships with other agencies

How effectively does the Center relate to other educational agencies so as to ensure that its work is both responsive to educational needs and used to the maximum in meeting them?

#### Classrooms, schools, local, county, and state educational agencies.

The most telling point of impact in all educational research and development work, and especially ours, is the classroom teacher working with students in schools. We have carried out research and development field work in association with a great number of individual schools and 19 school districts spread over the 2300-square-mile San Francisco Bay area. Here is where our efforts have concentrated and where we have our most extensive contacts.

A significant change has been taking place in research worker/field relationships during the past few years, one which is reflected in all three of our programs. It is becoming almost standard practice for research and development projects to have built into them provisions for workshops and individual and small group conferences which report back research results and in other ways provide assistance to teachers and administrators in schools where data have been collected. Research and development workers increasingly realize that it is wise as well as necessary to earn their right to use field sites for research, experimentation, and developmental work by providing some form of helpful service to participants in return. Further, researchers and developers are more and more including teachers and administrators as team members in their

enterprises, which in the long run may improve the work itself as well as make it more acceptable to the ultimate consumers in the schools. This may be illustrated by three examples, one from each program. Work under Pauline S. Sears (Program 1, Component 1F) has involved a year-long weekly workshop with teachers of young children based on the materials from this component. Robert Hess's work on Student Motivation and Engagement (Program 3, Component 3C) will provide a workshop in May 1972 to report to and discuss with teachers the results of observations and videotaping of their classes earlier in the year. Frank Brunetti's project with a nearby school district (Program 2, Component 2F) outlines the way in which Center-developed instruments and evaluation designs are helping the school to assess the effectiveness of its experimental work with differentiated-staffing patterns.

California has recently established by law the nation's first predominantly professional teacher licensure and standards board (through the Ryan Act). It has also passed a far-reaching law requiring that all teachers, both tenured and non-tenured, be regularly evaluated on the basis of their performance, both in and outside of the classroom (the Stull Act). The processes of licensing teachers, of setting standards for their training, and of judging teachers according to their performance are problems that are as important as they are controversial and difficult. These operations must be made to work better than they have in the past if teaching in schools is to be improved. The Center's programs took shape before these laws were passed. Nonetheless, it is our judgment that the work of the Center ought to be directly concerned with this real world, and that the Center should help in the solution of the problems that these governmental agencies are charged with solving. During the past year we have testified before the new Commission on Licensure and in other ways supplied information on some of the questions they have under consideration. The Center participated actively in a Statewide Conference on performance-based teacher education sponsored by the Commission on Licensure by building and sending a display of Center materials and by sending staff members who took significant leadership roles in the conference. The Center now intends to enter more actively into this arena. (See Program 1, Component 1B.)

One extensive involvement with local community and education authorities is represented in the largest Center Affiliated Project, that on Urban/Rural School Development (see Appendix B), funded by the Bureau of Educational Personnel Development, and directed by the director of the Low-Income program. This is a nationwide effort in which field agents stationed in different regions of the country are engaged in helping severely impoverished local communities to gain control of their educational institutions and resources so that they can make the changes that are so necessary if the needs of poor children are to be more adequately met. The project represents a significant attempt to develop a delivery and support system for the products that are being developed in the Low-Income program, in other laboratories and centers, and in other private and governmental agencies concerned with the problems of poor people and their education. The project can also have significant impact by letting the researchers and developers know what the people in poor communities consider their true educational needs and desires to be.

During this last year, the Low-Income program also entered into arrangements with two urban school districts for a continuing longitudinal study of the extent and nature of teacher transfer and dropout and correlative factors. It is anticipated that other urban school districts will join and that data will be shared. Surprisingly, while much has been said about teacher transfer and dropout, especially in urban schools, our search has found little hard data.

The Center has been following the emergence of the national educational renewal site program and intends to establish close relationships with one or more sites so that their emerging needs can shape our efforts and we can use them as field testing sites and in other ways help them to make use of the Center's products.

Other centers and laboratories. The longest and closest relationship with other centers and laboratories has been with the Far West Laboratory. Stanford University and Center personnel have served and continue to serve on their Board and review panels. Their personnel serve on ours. The close relationship between the technical skills and microteaching work of the Center and the Minicourse developments at the

Far West Laboratory is well known. Teaching protocol materials have recently been produced, field tested, and readied for market as the result of a BEPD-funded joint FWL-SCRDT project. There has been continuous interchange of materials between the Texas Center and Stanford's program on Teaching Effectiveness. We are now in the process of determining what elements in the Texas materials should be incorporated in our Teacher Training Automat and in other parts of the newly-designed Model Teacher Training System. The staff in the Environment for Teaching program have visited the Oregon Center and are supplying instrumentation developed at Stanford which Oregon will be using in its study of the organizational consequences of introducing a Wisconsin Center product, the multi-unit school.

The Center receives the reports of other centers and laboratories as do they ours, and our documentation service regularly routes these reports, as well as those of ERIC, for inspection by the appropriate program personnel. In this way, the cumulative effects of programmatic research and development efforts are beginning to be felt not only on work within centers and laboratories but among them as well.

National and international agencies. Individual members of the Center staff play active roles in many national and international groups through which the materials of the Center are disseminated, subjected to critical scrutiny, and exercise influence. The work of the Center is prominent in national professional meetings, especially those of the American Educational Research Association and the American Psychological Association. Senior Center personnel are actively engaged in preparing several forthcoming volumes of the National Society for the Study of Education in the fields of Teacher Education, Behavior Modification, and the Psychology of Teaching Methods. The Center has been continuously represented on the Educational Testing Service's Advisory Committee on Teacher Examinations.

The internationalization of the Center has been very much on our minds as an important objective. During the past year we have been active in two important UNESCO projects, one to establish research and development capability in teacher education in Asian countries, and one to write

a critical analysis which eventuated in a Center R&D Memorandum also to be distributed by UNESCO, entitled Group dynamics and the teacher-student relationship: A review of recent innovations.\* We have also participated in the International Educational Achievement Study planning international research on teacher behavior and student achievement. Each year our staff numbers several members from other countries. A substantial number of overseas visitors come to the Center each year. Our publications are increasingly in demand by international organizations and agencies.

Visitors. The roster of visitors to the Center during the past year represents contacts with a wide variety of national and international agencies. In addition to the usual influx of visitors from across the United States, we have had visitors from the following foreign countries, many of which are developing their own R&D centers: Australia, Belgium, Canada, China (Hong Kong), Denmark, England, Germany, India, Iraq, Israel, Japan, New Zealand, the Philippines, Poland, Puerto Rico, Saudi Arabia, Scotland, Sweden, Thailand.

In concluding this section of illustrative examples of relationships with other agencies, it may be pointed out that in the early stages of our work, where needs assessment was predominant, field contacts were extensive. Now as our programs move into prototypic and field testing stages, the network of relationships with local, state, and regional systems, including collegiate teacher training programs, will change and no doubt expand even further than has been the case during the recent research and design phases of work. These relationships will continue to present a challenge to our judgment in achieving the correct balance between responding to outside forces and agencies and responding to our internal requirements for program accomplishments.

#### New directions

This Basic Program Plan sets forth in detail the ways in which the

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\*Crist, J. Group dynamics and the teacher-student relationship: A review of recent innovations. R&D Memorandum 81. Stanford, Calif.: Stanford Center for Research and Development in Teaching, 1972.

three programs of the Center now intend to proceed. The Center continues to generate and to receive stimulating ideas for new projects and programs which are well within the scope of its mission. During the past year, in a comprehensive request for supplemental funding, the Center asked for limited planning money to explore two new ventures, a model teacher education program, and a program for improving teaching at the higher-education level. We continue to believe that we should enter into serious planning in these two fields and hope that we may be able to do so as soon as possible. Following is a brief rationale that was given at the time of the request.

Plan for a model teacher education program.

The time is ripe for the Center to begin to apply, in a more systematic and comprehensive way, the best of the ideas and materials that we have been developing over the past six years. We need to go beyond our present use of the Stanford Teacher Education Program (STEP). This new venture would take the form of a comprehensive program of teacher education which the Center would fully control and could use for testing and further development of the ideas and materials with which we have been concerned. This effort would expand and place in a larger setting the already planned installation and tryout of the Model Teacher Training System being developed by the program on Teaching Effectiveness.

The main justification for such a proposal is the added reality which it would give to the work we are doing. It would also give us a greater degree of control over the manner in which Center ideas are introduced and tested, thus substantially enhancing the possibility of their success.

If we are concerned with teaching but are not responsible for some pre-college teaching ourselves, and if we are concerned with improving teacher education but are not fully involved in conducting teacher education, there is always the possibility that we may be forgoing the sort of healthy pressure that can often produce the greatest degree of creativity in solving problems.

It seems highly probable that if the Center were responsible (a) for selecting those who demonstrate aptitude for effective teaching

(particularly as it is being operationally defined in our Model Teacher Training System); (b) for planning and operating a comprehensive program for preparing such persons to teach effectively, using all of the concepts, materials, and systems we have developed in our three programs or might borrow from other sources; and then (c) for introducing these teachers into an "open" school in a low-income area, we would have a tangible laboratory for seeing how our total program fits together. The excitement which would probably be generated as a majority of the Center staff worked together on this practical unifying program would be beneficial to the work we are doing in our respective projects and programs.

The numbers of teachers and students in the program should probably be small, but they might span a wide age-grade level, perhaps from preschool through the secondary level. We need not think of all subject matters and all grade levels, but can rather sample a few. In this endeavor we ought to consider possible collaboration with the Bay Area Teacher Education Center, funded by the Bureau of Educational Personnel Development; the San Mateo County Educational Resources Center, said to be one of USOE's model educational information retrieval centers; the Far West Laboratory, including the use of its teacher training materials; and the newly formed Teacher Training Complex, which includes the Far West Laboratory, Oakland Public Schools, and Hayward State College, and is also supported by BEPD.

Explore the feasibility of a new program for improving teaching at the higher education level.

For several years now the pressure has been mounting for the Center to become involved with the improvement of teaching at the collegiate level. Turmoil on campuses increasingly centers around student dissatisfaction with the kind of education they are receiving, with an alleged neglect of teaching and with obsolescence in teaching methods and styles.

The central administration at Stanford, which is searching for ways to tackle the problem, has established a small staff to work on the problem through the Office of the Dean of Undergraduate Studies. They have asked for help from the Center. A number of departments in the

University have approached the Center to determine what we have learned or developed in our work that would be useful to them. Never has there been such a readiness on the part of science and humanities faculties to turn attention to pedagogical matters. The construction of a new building devoted to the study and improvement of teaching, located in the center of the campus, has stimulated added interest on the part of the faculty. FY 72 is thus the propitious year for planning our entry into a program for improving teaching in higher education.

In September 1972 when we move into our new building in the center of the Stanford campus, we anticipate that we shall be entering upon a new era in the life of the Center when new programs will be added and new directions within programs will be discovered.

APPENDICES

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Appendix A

PERSONNEL RESUMES

J. Victor Baldrige. Assistant Professor of Education and Sociology; Research and Development Associate, SCRDT. Ph.D., Sociology, Yale University, 1968. Relevant prior experience: Teaching Assistant in Sociology, Yale University, 1966-1967; Assistant Professor of Sociology, Albertus Magnus College, 1967-1968. Primary areas of expertise: Applying sociological theories of complex organizations to academic governance in universities; developing a theory of organizational change and adaptation based on political frameworks.

Frank A. Brunetti. Research Associate, School Planning, School of Education; Research and Development Associate, SCRDT. Ph.D., School Administration, Stanford University, 1970. Relevant prior experience: Research Associate, Research in Educational Planning Center, University of Nevada, 1966-1967; Senior Research Assistant, School Planning Lab, School of Education, Stanford University, 1967-1970; Visiting Lecturer, Department of Educational Administration and Supervision, University of Wisconsin, Summer, 1969. Primary areas of expertise: Educational planning; organizational theory; environmental psychology.

Robert N. Bush. Professor of Education; Director of SCRDT. Ed.D., Higher Education, Stanford University, 1941. Relevant prior experience: Dean of Men and Assistant Registrar, Northern Colorado State University, 1935-1937; Teacher of History and Social Problems, Counselor, Menlo School and College, Menlo Park, California, 1937-1939; Research Associate, Acting Assistant Professor, School of Education, Stanford University, 1939-1943; Dean of the Faculty, Kansas State Teachers College, 1943-1945; Director, Vocational Guidance and Placement, Stanford University, 1945-1949; Senior Fulbright Researcher, University of Sydney, Australia, 1955-1956; Ford Foundation Consultant in Teacher Education in Latin America, 1960's. Primary areas of expertise: Secondary education; teacher education; teacher personnel.

Richard E. Clark. Director of Instructional Technology and Information Services, Research and Development Associate, SCRDT. Ed.D., Research in Audio-Visual Communications, Mass Communications, Indiana University, 1970. Relevant prior experience: Associate producer of television programs, WFIL-TV, Philadelphia, 1964; Instructor in Communications, Rutgers University, 1964-1965; Acting Chairman, Broadcasting Department, Western Michigan University, 1966-1967; Pre-doctoral Research Fellow, Department of Instructional Systems Technology, Indiana University School of Education, 1968-1970; Director, Center for Communications Research and Associate Professor, Department of Communication Studies, Sacramento State College, 1970-1972. Primary area of expertise: Media research, including interactions between media and learner characteristics in instruction, uncertainty and information search, selection and administration of media systems.

Elizabeth G. Cohen. Associate Professor of Education and Sociology; Director, The Environment for Teaching Program. Ph.D., Special Fields (Social Stratification and Socialization of the Child), Harvard University, 1958. Relevant prior experience: Instructor in Sociology, Boston University, 1957-1958; Research Associate, Communications, Stanford University, 1959-1961; Research Associate, Lecturer, Sociology, 1964-1966; Lecturer, School of Education, 1964-1966; Assistant Professor, Sociology and Education, 1966-1969. Primary areas of expertise: Race and education; client orientation in teachers as a function of organizational arrangements; professional ambition in women.

Sanford M. Dornbusch. Professor of Sociology; Research and Development Associate, SCRDT. Ph.D., Sociology, University of Chicago, 1952. Relevant prior experience: Instructor in Sociology, Syracuse University, Summers, 1948-1949; Senior Research Assistant, Research Associate, Chicago Community Inventory, University of Chicago, 1949-1952; Instructor, Sociology, University of Illinois at Chicago, 1950-1951; Instructor, Sociology, Indiana University at Gary, 1950-1952; Assistant Professor, Sociology, University of Washington, 1952-1954; Fellow, Center for Advanced Study in the Behavioral Sciences, Palo Alto, California, 1954-1955; Assistant

Professor, Sociology, Harvard University, 1955-1958; Associate Professor, Sociology, University of Washington, 1958-1959; Associate Dean, School of Humanities and Sciences, Stanford University, 1961-1962; Director, Laboratory for Social Research, Stanford University, 1961-1962; Executive Head, Department of Sociology, Stanford University, 1959-1964; Ford Professor of Sociology, University of Ibadan, Nigeria, 1966-1967. Primary areas of expertise: Formal organizations; social psychology.

Janet D. Elashoff. Assistant Professor of Education and Educational Statistics; Director, Methodology Unit, Research and Development Associate, SCRDT. Ph.D., Statistics, Harvard University, 1966. Relevant prior experience: Teaching Fellow in Statistics, Harvard University, 1963-1964; Research Associate, Anesthesia Department, Stanford University, 1965-1966; Visiting Professor in Statistics, Harvard University, Summer, 1966. Primary area of expertise: Statistical methodology.

Maurice D. Fisher. Research and Development Associate, SCRDT. Ph.D., Educational Psychology, University of Virginia, 1971. Relevant prior experience: Instructor, Psychology, University of Wisconsin, 1963-1964; Instructor, Psychology, Norfolk State College, Virginia, 1965-1967; School Psychologist, Public Schools, Charlottesville, Virginia, 1967-1968; Instructor, Educational Psychology, University of Virginia, 1968-1969; Director of Research, Title III, Public Schools, Richmond, Virginia, 1969-1970; Consultant, Title III Program in Early Education for Disadvantaged Children, Public Schools, Richmond, Virginia, 1970-1971; Acting Assistant Professor, Education, University of Virginia, 1970-1971. Primary areas of expertise: Educational research in early and primary education; educational evaluation of programs with disadvantaged children; studies of cognitive and social development in preschool and primary grade children.

N. L. Gage. Professor of Education and Psychology; Chairman of the Executive Board, Director, Program on Teaching Effectiveness, SCRDT. Ph.D., Psychology, Purdue University, 1947. Relevant prior experience: Assistant Director (Assistant Professor), Division of Educational Reference, Purdue University, 1947-1948; Assistant Professor, Associate Professor, Professor, Education, University of Illinois, 1948-1962; Professor, Psychology,

University of Illinois, 1961-1962; Fellow, Center for Advanced Study in the Behavioral Sciences, Palo Alto, California, 1965-1966. Primary area of expertise: Educational and social psychology, particularly as it relates to relationships between teacher behavior and student achievement.

Bruce Harlow. Director, Publications and Dissemination, SCRDT. M.A., Columbia University, Public Law and Government, 1951. Relevant prior experience: Professional librarian, 1939-1942, 1946-1950; Professor of Humanities and Social Sciences, Webb Institute of Naval Architecture, Glen Cove, N.Y., 1950-1953; College Textbook Editor, three commercial publishers, 1954-1968. Primary areas of expertise: Editing, cost estimating, and development of educational publications; original writing, communications.

Annegret Harnischfeger. Research Psychologist on leave from the Max Planck Institute for Educational Research, Berlin; Research and Development Associate, SCRDT. Dr. phil., Psychology (Education, Criminal Law), Christian Albrechts University of Kiel, 1971. Relevant prior experience: Teaching Assistant, Sociology of Education, Free University of Berlin, 1967-1970; Research Psychologist, Max Planck Institute for Educational Research, 1966-date; Instructor, Psychology, Teachers College, Berlin, 1971; Organizer and Administrator, International Seminar on Learning and the Educational Process, Munich, Summer, 1971. Primary areas of expertise: Political socialization; curriculum research and development; educational policy; psychoanalysis.

Robert D. Hess. Lee L. Jacks Professor of Child Education and Professor of Psychology; Director, Program on Teaching Students from Low-Income Areas. Ph.D., Committee on Human Development, University of Chicago, 1950. Relevant prior experience: Instructor, Secretary, The Committee on Human Development, University of Chicago, 1949-1953; Assistant Professor of Human Development, University of Chicago, 1953-1959; Associate Professor of Human Development and Education, Chairman, The Committee on Human Development, 1959-1964; Professor of Human Development and Education, Director, The Urban Child Center, University of Chicago, 1964-1967; Director, Early Education Research Center, University of Chicago, 1965-

1967; Fellow, Center for Advanced Study in the Behavioral Sciences, Palo Alto, California, 1966-1967. Primary areas of expertise: Socialization, particularly the relationship between social structure and behavior; child and adolescent development; family interaction; early cognitive development; political socialization; the effect of cultural and socio-economic environments upon learning.

Robert H. Koff. Assistant Professor of Educational Psychology; Visiting Scientist, Laboratory for Hypnosis Research; Research and Development Associate, SCRDT. Ph.D., Clinical and Educational Psychology, University of Chicago, 1966. Relevant prior experience: Counselor, Teacher, Sonia Shankman Orthogenic School, University of Chicago, 1961-1963; Psychologist, Institute for Juvenile Research, Chicago, 1963; Project Co-Director, Department of Education, University of Chicago, 1963-1966; Elementary School Teacher, University of Chicago Laboratory School, 1964; Instructor, University of Illinois, Summer, 1964; Visiting Scholar, Hampstead Clinic, London, Summer, 1965; Research Associate, Lecturer in Education, University of Chicago, 1964-1966. Primary areas of expertise: Social psychology; group dynamics; dynamic theories of personality; theories of instruction; teacher evaluation.

Henry M. Levin. Associate Professor of Education and Affiliated Faculty of the Department of Economics, Research and Development Associate, SCRDT. Ph.D., Economics, Rutgers University, 1967. Relevant prior experience: Research Assistant, Bureau of Economic Research, Rutgers University, 1961-1963; Research Associate, Assistant Instructor, Bureau of Economic Research, Urban Studies Center, Rutgers University, 1963-1964; Instructor, Economics Department, Rutgers University, 1964-1965; Associate Research Scientist, Graduate School of Public Administration, New York University, Senior Staff Member, Mayor's Temporary Commission for the Study of New York City's Finances, 1965-1966; Research Associate in Social Economics, Economic Studies Division, The Brookings Institution, 1966-1968. Primary areas of expertise: Economics of education; urban economics; public finance; economics of human resources; decentralization of large-city school districts.

John W. Meyer. Associate Professor of Sociology; Research and Development Associate, SCRDT. Ph.D., Sociology, Columbia University, 1965. Relevant prior experience: Research Assistant, Associate, Bureau of Applied Social Research, Columbia University, 1957-1966; Research Associate, Laboratory for Social Research, Stanford University, 1966-1971. Primary areas of expertise: Methodology, social stratification; political sociology; sociology of education; formal organizations.

Sheila R. F. Molnar. Research and Development Associate, Coordinator, The Environment for Teaching Program, SCRDT. Ph.D., Sociology of Education, Stanford University, 1971. Relevant prior experience: Counselor, teacher, William Healey School, Institute for Juvenile Research, University of Illinois Medical Center, Chicago, 1961-1963; Teacher, Markham School District, Markham, Illinois, 1963-1964; Teacher, Woodland Joint Unified School District, Woodland, California, 1964-1967; Instructor, Sacramento State College, 1966-1967; Research Assistant, SCRDT, 1968-1970. Primary areas of expertise: Applying sociological theories and basic research in complex organizations and small groups to education; developing support services and in-service training programs for teachers and administrators in the area of improvement of interaction with students, colleagues, parents, and the community; improvement of teaching performance through analysis of teaching outcomes and appropriate modification of methods and materials.

Bradford K. Perry. Administrative Manager, SCRDT. M.B.A., Accounting and Organizational Behavior, Stanford University, 1970. Relevant prior experience: Planning, budgeting positions, U.S. Navy Supply Corps, 1964-1971; Lecturer in Business Administration, Stanford University, 1972. Primary area of expertise: Management.

Robert L. Politzer. Professor of Education and Romance Linguistics; Acting Director, Secondary Teacher Education Program; Research and Development Associate, SCRDT. Ph.D., Romance Philology, Columbia University, 1947; D.S.Sc., Political Science and Economics, New School for Social Research, 1950. Relevant prior experience: Lecturer, Columbia University, 1947-1949; Assistant Professor, University of Washington, 1949-1952;

Assistant Professor, Director of Language Instruction in Romance Languages, Harvard University, 1952-1956; Associate Professor, Professor, University of Michigan, 1956-1963. Primary areas of expertise: Historical and descriptive linguistics; applied linguistics; educational research in foreign language learning and bilingual and bidialectal education.

W. Richard Scott. Professor of Sociology; Research and Development Associate, SCRDT. Ph.D., Sociology, University of Chicago, 1961. Relevant prior experience: Assistant Professor, Associate Professor, Stanford University, 1960-1969; Edmund P. Learned Distinguished Professor of Business Administration (Visiting), University of Kansas, 1970-1971. Primary areas of expertise: Study of formal organizations; professional groups; authority and evaluation processes.

Pauline S. Sears. Professor of Education; Research and Development Associate, SCRDT. Ph.D., Clinical Psychology, Yale University, 1939. Relevant prior experience: Instructor, Clinical Psychologist, School of Medicine, Yale University, 1936-1942; Research Associate, Iowa Child Welfare Research Station, State University of Iowa, 1942-1949; Research Associate, Lecturer, Education, Harvard University, 1949-1953; Lecturer, Assistant Professor, Associate Professor, Education, Stanford University, 1953-1966. Primary area of expertise: Child development.

Richard J. Shavelson. Acting Assistant Professor of Education; Research and Development Associate, SCRDT. Ph.D., Educational Psychology, Stanford University, 1971. Relevant prior experience: Research Psychologist, Lockheed Corporation, 1966-1968; Research Assistant, SCRDT, 1968-1969; Lecturer, Education, Stanford University, 1970-1971. Primary areas of expertise: Human learning and memory; instruction; measurement and evaluation.

Richard E. Snow. Associate Professor of Education; Chairman, Committee on Psychological Studies in Education; Research and Development Associate, SCRDT. Ph.D., Psychology, Purdue University, 1963. Relevant prior experience: Graduate Assistant, Instructor, Psychology, Purdue University, 1959-1962; Assistant Professor, Associate Professor, Audio-Visual Center, Purdue University, 1962-1966; Assistant Head, Instructional Media Research

Unit, Purdue University, 1962-1965; Assistant Professor, Education, Stanford University. Primary areas of expertise: Psychological research on individual differences, particularly human abilities as related to learning; media and methods of instruction, including the behavior of human teachers, visual media for instructional and research purposes.

Carl E. Thoresen. Associate Professor of Education; Research and Development Associate, SCRDT. Ph.D., Counseling Psychology (Education), Stanford University, 1964. Relevant prior experience: Counselor, Teacher, San Jose School District, San Jose, California, 1956-1961; Teaching/Research Assistant, Stanford University, 1962-1965; Counseling Consultant, Monterey County Schools, California, 1963-1965; Instructor, San Jose State College, 1963-1964; Lecturer, Education, Stanford University, 1964-1965; Assistant Professor, Michigan State University, 1965-1967; Assistant Professor, Education, Stanford University, 1967-1969. Primary areas of expertise: Experimental research in counseling-psychotherapy techniques; "systems" techniques in professional training programs; behavioral-environmental analysis and modification strategies; developing techniques of behavioral self-control.

Appendix B

STANFORD URBAN/RURAL SCHOOL DEVELOPMENT INSTITUTE

The Stanford Urban/Rural School Development Institute, under the directorship of Robert D. Hess, is organized to serve and facilitate the Urban/Rural School Development Program of the U.S. Office of Education. This Program is a teacher-training project initiated and funded by the Bureau of Education Personnel Development and is designed to help citizens in seriously economically impoverished areas to participate with teachers to expand and improve the educational opportunities and resources in their communities. The program began in 1970 and is located in approximately 66 schools in low-income urban and rural areas. Twenty-four separate school districts serving Black, Mexican-American, American Indian and white citizens in the various parts of the United States are participating in the project.

The Institute provides facilitating services, both organizational and technical, to each community project and is particularly concerned with the development of the School Community Council which is organized at each site to plan and direct the program. At least 50 percent of this council is composed of community representatives. The council selects the programmatic areas of training and allocates the use of USOE funds at the local site. The Institute has a staff of eighteen, half of which is located at Stanford; others (Regional Coordinators and site Field Facilitators) are field based, some on a part-time basis, to maintain close contact with the local councils.

The Institute employs available resources in education, communications, and behavioral and social sciences in developing a coordinated series of on-site services to accomplish the following specific objectives:

1. To coordinate continuous on-site technical assistance services to support local objectives and national expectations outlined by USOE;
2. To provide and/or coordinate training activities for local School/Community Council members and project managers in such areas as needs assessment, program planning and management techniques;

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3. To provide policy recommendations to USOE staff with regard to training activities, local needs, site visits;
4. To identify resource personnel knowledgeable about special problems and concerns of the school-community sites, enlisting their sources and orienting them to national and local goals of the projects prior to their involvement on site;
5. To coordinate and identify educational resources and materials for use by the local project staff.

The overall strategy for developing and providing Institute services is based on projections of local project program goals. These program goals change as the project develops, and the Institute's task is to assist the local councils as their needs and objectives emerge. The Institute also helps provide communication among Urban/Rural sites for exchange of ideas and experiences about particular kinds of program components. Both regional and national conferences are organized to facilitate training and exchange of information.

Appendix C

EXCERPTS FROM REPORT OF TEACHER EDUCATION TASK FORCE,  
STANFORD UNIVERSITY SCHOOL OF EDUCATION  
(MARCH 1972)

Component\* III: Research and Development Programs

Teacher education, as one of the most crucial parts of the educational system, needs a much more substantial knowledge base to enable it to meet the mounting demands that are being made upon it. An essential, indeed uniquely appropriate, element in a program of teacher education at Stanford is one that attends to building this intellectual base.

The research and developmental activities in teacher education in the future would encompass and extend the work of the Stanford Center for Research and Development in Teaching and such other efforts in the School as individuals and groups might wish to undertake in expanding our knowledge base.

In this component (III), as in the other two components (I, II) in the overall program proposed by the Task Force, we lead from strength. The basic research competence and interest of the faculty in studying the processes of teaching and learning have been attested to (see recent AERA surveys, Task Force Survey of Interest, etc.). The now six-year-old Stanford Center for Research and Development in Teaching, which will be moving next year into a modern and richly equipped R&D facility adjacent to the School, brings yet another resource for adding to the solidity of the foundation for teacher education programs at Stanford.

How can the best benefits be attained? Programs of teacher education and the R&D Center are both enduring parts of the School and belong together in the same family or constellation. They each have their unique functions, but there are large common areas. Their relationships need clarification and delineation. An important and necessary task is to

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\*[Readers of this SCRDT Basic Program Plan should recognize that "component" is used in a different sense in this Task Force Report.]

clarify and strengthen the relationship between the R&D Center and Stanford's teacher education programs. At this time the School has one substantial program for preparing secondary school teachers (STEP) and one small dwindling program for preparing junior college teachers. We have no program for training elementary teachers, and although a substantial number of our doctorates become college teachers, we have no planned program for preparing teachers at the tertiary level.

The relationship between the Center and the one substantial existing program (STEP) has varied over the years of the Center's existence. The Center's origins can in some substantial measure be traced to the STEP program that preceded it. Through microteaching and in other ways the Center received a substantial legacy which helped it on its way.... In the last few years, as alluded to earlier in this report, the relationship has not been as close as in earlier times. It seems to the Task Force that in planning the future of teacher education at Stanford, a close, reciprocating, reinforcing, and complementary state should characterize relationships between the R&D Center activities and whatever programs in teacher education the School decides to develop. What are some of the ways in which this desirable state of affairs can be ensured? Several suggestions are offered for consideration.

1. The present arrangement should be continued whereby the Director of Teacher Education is a member of the Center's Executive Board. He may also serve as an R&D Associate in the Center, with program concerns. As a new person is selected for this position, the nature of those substantive concerns, if they should develop, should be carefully examined to ensure that they best serve both the teacher education and the Center's programs.

2. The Center, as a sub-group of the faculty of the School, is currently considering whether it should develop and eventually operate one of the new small programs envisaged in the Task Force report....

3. Those responsible for developing new programs in teacher education ought to familiarize themselves with the Center's past work and projected activities to determine what might be useful. Those designing new programs ought to consider the research and development facilities

that will be available in the new building, e.g., the television and film studios, the information retrieval system, the small and large group and the flexible teaching laboratory space, and the instructional materials production section....

4. Groups planning new programs might, after familiarizing themselves with the Center's mission and programs, consider the possibility of having the new programs become an integral part of one or more of the Center's R&D programs or becoming affiliated projects of the Center. Affiliated Center projects are those which have a close affinity with the Center's main mission and programs, but which are financially supported outside of the Center's main contracts.

5. Those responsible for teacher education programs should systematically review all of the products of the Center, as well as of the other centers and regional educational laboratories. Reports are available in the Center's library. Such a review might help to answer the question of whether these products are being used as much as possible to strengthen the training programs.

6. Currently the Teaching Effectiveness Program in the Center is about to give birth to a new teacher training system that it has agreed to install and field test over the next few years. Every possible consideration should be given to the use of one or more of Stanford's teacher education programs as field sites.

7. It has been the experience of the Center that attention to evaluation and data-gathering questions in the early stages often pays off handsomely. Inasmuch as the evaluation section below recommends that no new program be undertaken without adequate attention to evaluation, arrangements might be made so that new program developers might as a part of their total efforts at evaluation avail themselves of services from the research methodology unit of the Center, especially in the design phase of their proposals.

8. Since the program in teacher education recommended by the Task Force has been designated as one of continuous professional development and will consequently be heavily weighted on the in-service education side, and since the R&D Center programs too are extensively engaged in

working with experienced teachers in the field, the efforts of the two groups should be coordinated and carried on in a cooperative and complementary fashion.

9. One problem that future collaborative efforts should be sensitive to is the negative feeling of teacher trainees when they are the subjects of experiments and other types of research. Some have expressed that they feel they are being used as guinea pigs. Many things can and should be done to prevent this: e.g., bring trainees in early as partners in the research, make good initial explanations, make adequate provisions for consent and opportunity for withdrawal, ensure confidentiality of data, provide feedback, and conduct appropriate debriefing. The trainees' rights to an adequate and realistic preparation for initial teaching must be protected.

The relationship between the teacher education programs in the School of Education and the work of the R&D Center should be strengthened by implementing the foregoing list of suggestions. The unfortunate dichotomy into which research and practice and research and training have so often been cast may be partly overcome by realizing that the new concept of R&D in education lies directly in the mainstream of practice and training. The concept of "evaluation by successive approximations" is increasingly coming to characterize the design of training programs, curriculum development projects, and educational R&D efforts. This concept follows a definite cycle: it begins with definition of objectives, proceeds through design and execution of programs, engages in continuous gathering of data on what works and doesn't work and with whom, provides feedback, and makes necessary corrections of programs, at which point the cycle begins again and is repeated until a satisfactory level of performance is reached.

Appendix D  
GUIDELINES  
FDR THE  
ORGANIZATION AND OPERATION OF THE CENTER  
(MARCH 1968)

Introduction

The organization of the Center consists of the following major components:

- I. Officers
- II. Executive Board
- III. Advisory Panel
- IV. Research and Development Associate Staff

I. Officers

A. Composition of Component

The officers of the Center shall consist of (a) a full-time Director of the Center and (b) a Chairman of the Executive Board, who are appointed by the Dean of the School of Education and serve at his pleasure; (c) Coordinators of the major program components in the Center, appointed by the Director in consultation with the Research and Development Associate Staff; (d) an Administrative Officer who is appointed by the Director and serves at his pleasure; and such other administrative personnel as the Director may designate.

B. Duties, Responsibilities, and Organizational Features of the Component

1. The Director is responsible under the terms of the principal and related contracts for supervising the work of the Center to assure that the terms and conditions of all contracts are met. He shall initiate proposals for action on matters of policy, program, personnel, projects, and budget. The term "initiate" here signifies merely the formal aspect of initiation; the Center encourages informal initiative, in the form of suggestions and recommendations, by all persons concerned with the Center. It shall be the responsibility

of the Director to receive program and project proposals from Center Staff and from outside, to react to these, and to pass them on with his recommendations to the Executive Board for their consideration. The Director shall also implement the Center's policies and actions relating to program, personnel, and budget (a) by allocating personnel and funds according to the general plans adopted by the Executive Board, (b) by making appointments of Research and Development Associates with the advice and approval of the Executive Board, the Dean, and other University officials as required, and (c) by formulating the budget for the approval of the Executive Board and controlling expenditures accordingly. The Director shall be responsible for preparing the periodic reports to the U. S. Office of Education and other agencies requiring them, making use of the progress reports of the various project and program leaders. He shall perform any other functions not herein delegated to another group or individual. He may delegate such of his functions as may from time to time seem desirable, while continuing to retain the ultimate contractual responsibilities mentioned above.

2. The Chairman of the Executive Board is responsible for coordination of the review and planning of the research and development work of the various program components of the Center. Specifically, he shall chair regular meetings of the Executive Board at which (a) the Director's proposals for action on matters of policy, program, personnel, projects, and budget will be considered, (b) progress in various program components and projects will be reported, reviewed, and evaluated, (c) desirable revisions of ongoing research and development projects will be formulated, and (d) plans for new programs and projects will be adopted.

3. The Coordinators of each of the various program components shall be responsible to the Director for implementing the research and development policies and programs established by the Executive Board. Specifically, each shall be responsible for (a) defining and clarifying the objectives of his program component, (b) relating the work of that component to the other components and to the goals of the Center,

(c) assigning and coordinating the personnel allocated to that program component, and (d) reporting periodically in writing on the work of the program component.

4. The Administrative Officer shall be responsible, in the operation of the Center, for carrying out the duties assigned to him by the Director. He shall act as secretary to the Executive Board and the Advisory Panel.

## II. Executive Board

### A. Composition of Components

The Executive Board shall consist of the Chairman of the Board, the Director, the Administrative Officer, ex-officio, as secretary, and not more than six professional staff. These members shall be appointed annually, in June, by the Director after consultation with the Research and Development Associate Staff. They shall normally be the Coordinators of the major program components of the Center, with at least one who comes from outside of the Staff of the Center.

### B. Duties, Responsibilities, and Organizational Features of the Component

The Executive Board shall be responsible for formulating the goals of the Center, for establishing general policies and programs in harmony therewith, for reviewing and evaluating the progress of the various program components, for approving the appointment of professional personnel, and for adopting the budget. It will normally (a) meet once per month for two-hour sessions at a regular time, (b) have agenda prepared by the Administrative Officer, in consultation with the Director and the Chairman, distributed in advance, with supporting documentation, (c) meet with the Advisory Panel, (d) assist in policy interpretation and implementation, and (e) keep minutes of its meetings and distribute them to the Research and Development Associates. It shall create and ensure the effectiveness of mechanisms necessary to provide for long-range planning for the development of the Center. The Executive Board shall appoint ad hoc, or more permanent, advisory committees to the various programs of the Center as they are needed.

III. Advisory Panel

A. Composition of Component

The Advisory Panel shall consist of approximately 15 persons appointed for two-year staggered terms in June by the Dean of the School of Education upon recommendation of the Executive Board. The Dean shall annually in June designate the Chairman. The members of the Panel shall be drawn in approximately equal numbers from

1. The Stanford University community, e.g., the School of Education, the School of Humanities and Sciences, other professional schools, institutes, and the Central Administration of the University.
2. Local, state, regional, and other educational agencies, e.g., the Far West Laboratory for Educational Research and Development, Supplementary Education Centers, colleges, professional associations, the Stanford Research Institute's Educational Policy Center, state departments of education, and city and county school systems.
3. Experts in fields related to the program of the Center.

B. Duties, Responsibilities, and Organizational Features of the Component

The Advisory Panel shall normally meet twice per year for two full days (1) to review and suggest ways in which all parts of the school and University community can be effectively used in the work of the Center, (2) to review the program of the Center, (3) to assess the Center's products, (4) to suggest ways for strengthening its current operations, and (5) to call attention to pressing educational needs and possible lines of development. It shall receive all reports and publications, including the regular reports to and from the U. S. Office of Education, so that it may be fully informed of the work of the Center. The Panel shall be assigned sufficient staff to keep it informed and in other ways to assist it in the conduct of its work.

The expenses of attending meetings and an honorarium, to be established by the Executive Board, shall be paid by the Center. A written record of each meeting will be prepared and circulated to the Dean, the Executive Board, and Research and Development Associates.

IV. Research and Development Associate Staff

A. Composition of Component

The Research and Development Associates will be appointed by the Director, with the approval of the Executive Board, the Dean, and other University officials as required. The Research and Development Associate Staff shall constitute a formal body with the Director serving as Chairman.

B. Duties, Responsibilities, and Organizational Features of the Component

The Research and Development Associate Staff, and such others as they may designate, shall meet regularly at designated times to consider the work of the Center.

They shall receive and act upon matters referred by the Executive Board, suggest items for the Executive Board's agenda, and submit, either individually or collectively, written reports from time to time to the Executive Board and the Director.

They shall review the Director's appointments to the Executive Board and matters of interest to them which pertain to the aim, program, organization, and operation of the Center.

The Research and Development Associate Staff of the Center shall be appointed on the basis of two criteria: (1) their competence and its relevance to the program of the Center, and (2) their degree of commitment to the program of the Center, as reflected in willingness and ability to devote from one-third to one-half or more of their time to the Center's work.