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ABSTRACT

This report presents a collection of position papers and mission statements and traces the ways in which these papers contributed to an orderly sequence of events that resulted in the choosing of the Laboratory mission. Position papers cover the areas of full education, curriculum, instructional methods, and teacher education. The alternative mission proposals, which evolved from these position papers, cover the areas of (1) personnel requirements and educational change, (2) teacher education, (3) the interaction of educational variables, (4) teacher training product assessment, (5) the goals of education, and (6) communication and information services. The "Laboratory Mission Comparison Scale," used to compare the six proposals and to make a selection, is included. (Pages 59-97 and 164-306 may reproduce poorly.) (JF)

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PROGRAM DOCUMENTS

A Report of Program Decision-Making

September 15, 1967

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INTRODUCTION

This publication seeks to present, under one cover, a collection of previously unpublished Laboratory papers, and traces how they contributed to the orderly sequence of events called Program Decision-Making. Each of the papers was prepared by the Laboratory staff to aid in the process of achieving a program focus. / The reader is advised, however, that these papers do not tell the complete story. First, the decision-making process to which they contribute is on-going, and these papers will be followed by others. Second, this publication is supplemental to the information about the Laboratory's programs and decision-making processes, and does not adequately describe either the programs or the processes.

In view of the above two cautions, it is recommended that the reader also become familiar with other publications of the Far West Laboratory for Educational Research and Development shown in the bibliography. Of particular help in understanding the rationale and organization of the decision-making process is the Progress Report, March 31, 1966, or a non-technical version of it, the Initial Plan, June 15, 1966. Also recommended is a description of the present two Laboratory programs in Program Plans, March 1, 1967, which also presents a brief overview of the sequence of events that led to their selection.

In this Laboratory, the responsibility for making major program decisions resides with the Board of Directors, whose membership comprises the individuals appointed by the signatories to the Joint Powers Agreement and others appointed to represent other sectors of public interest. In making these decisions, the Board is advised by the Advisory Council, a small group of nationally prominent people, chosen to represent major philosophical orientations toward modern civilization and the life of the individual. The Advisory Council has the responsibility for reflecting the big educational picture in terms of national educational and social goals.

Specific recommendations for program, however, come to the Board of Directors from the Executive Panel which consists of representatives of the Board, Laboratory Management, Directors of the Programs, and others selected by the Board because of their unique competences in research and development. The Executive Panel, as a working organization, has the responsibility for making program recommendations, establishing priorities and for monitoring the work of programs and projects. In their work they are guided by principles stated in the Progress Report, March 31, 1966, Initial Plan, June 15, 1966, which describe the decision-making process, and the Rules for Conduct of Business adopted by the Board of Directors, which describes the powers of the Executive Panel. Specifically, the Laboratory is committed to two programs, Teacher Education and Communication, by a Board decision in March, 1967. Of great significance for the Executive Panel was the identification of five problem areas as being within the scope of Laboratory program interests during the early development of the Laboratory. They were described in the Progress Report, March 31, 1966, as follows.

1. Insuring Quality Education for All Students (Full Education)
2. Methods of Instruction and Guidance

3. Curriculum Development and Evaluation
4. Education of Teachers and Other Professionals
5. Communication and Information

The Executive Panel, at its first meeting in August, 1966, requested that the findings of the situation reviews in each Area be reported in the form of a Position Paper. In the fall of 1966, then, four situation reviews were conducted by the staff, who reported its findings as follows.

1. First Position Paper in the Area of Full Education
2. First Position Paper in the Area of Curriculum
3. First Position Paper in the Area of Instructional Methods
4. First Position Paper in the Area of Teacher Education

Also in the fall of 1966, a subcontract with Lockheed Missiles and Space Company resulted in a report, Communication and Utilization Study, Phase I, November 30, 1966, which was considered by the Panel in lieu of a Position Paper in the Area of Communication and Information.

To aid the Panel in the performance of its functions as they reacted to the Papers, the staff also prepared another type of document, "Educational Needs, Situational Reviews and Position Papers." It presents an analysis which had been found to be helpful to the staff in the preparation of the Position Papers.

After the Executive Panel reacted to the four Position Papers, and to the Communication and Utilization Study, it asked the staff to prepare several alternative proposals for Laboratory Missions.

The Panel, in making this request, had been guided by another paper prepared by the staff, "A Mission and a Program for the Far West Laboratory for Educational Research and Development." This paper discusses various approaches to educational change and relates them to each of the Areas that had been the object of a situation review. This paper also introduces several criteria for the selection of a mission.

At the January 1967 meeting of the Executive Panel, the staff presented six proposed programs for the Laboratory, in the form of mission proposals.

1. Personnel Requirements and Educational Change
2. Teacher Education
3. The Interaction of Educational Variables
4. Teacher Training Product Assessment
5. The Goals of Education
6. Communication

After two days of discussion, the Executive Panel used the "Laboratory Mission Comparison Scale" to compare the six proposals, and to make selection based upon criteria inherent in the Scale. The Panel selected Teacher Education and Communication as the two programs of the Laboratory.

The function of program planning does not stop, however, with the selection of a program. Planning within a program is an on-going function for the Laboratory, and the Executive Panel provides input to this process, or it monitors work performance in the programs.

Program planning, however, should continue in all of the five Areas, which had been identified as being within the interest of the Laboratory. The

Panel will continue to react to Position Papers in all Areas. The Second Position Paper in Full Education is an example of the continuing process of program decision-making.

In the future, therefore, additional Position Papers will be presented to the Executive Panel. These and other program documents, which will enable the Panel to study and make recommendations to the Board of Directors, will result in the gradual enlargement of this publication. From time to time, new editions will be made in order that the interested reader may be able to trace all of the steps involved in decision-making for the Far West Laboratory for Educational Research and Development.

EDUCATIONAL NEEDS, SITUATIONAL REVIEWS, AND POSITION PAPERS AND HOW THEY ARE RELATED

The purpose of this paper is to discuss the relationships among educational needs, the current state of knowledge as reflected by situational reviews, and the first series of position papers being developed in the Laboratory.

Field Needs

Educational needs may be divided into two broad catagories: field needs and research-identified needs.

Field needs may be estimated by drawing together information from any of a number of sources that are indicative or suggestive of problems or deficiencies in the field.

Perhaps the most scholarly and valid approach to the identification of educational needs would be first to establish a set of educational goals or objectives based on the careful judgment of a broad cross section of informed citizens, and then measure pupil performance to determine gaps between these stated objectives and the current status of pupils in the schools. Such a needs survey, however, is not possible with the instruments currently available to educational researchers. The technology of measurement, however, is at a point where measures could be developed to provide a broad assessment of the success of the school and community in achieving any set of stated educational goals.

One large body of data relative to field needs consists of self-report information obtained by interviews and questionnaires directed to persons interested in education. Such data are most commonly collected from teachers and school administrators, but may also be collected from interested citizen groups and students. Conferences of persons representing different school and community groups are also employed in many cases to estimate field needs. Information obtained from questionnaires, interviews, and conferences probably constitutes the most direct means of obtaining educational needs information. In the case of the questionnaire, responses are generally limited by the format of the instrument, therefore making certain types of responses difficult or even impossible. The questionnaire and interview also suffer from the weakness of being somewhat subject to the perceptual biases of the investigator. This deficiency is probably more serious in the case of the interview, but introduces a more subtle though no less real distortion in the case of the questionnaire as well. Perhaps the greatest deficiency of the conference approach is the danger that two or three strong leaders who have devoted considerable time to preparation can dominate such a conference and influence its outcomes far out of proportion to their numbers. These methods, however, although subject to the aforementioned weaknesses, probably constitute the most useful approach to the problem of field needs currently available. A requirement for the questionnaire, interview, and conference is that the respondents be given some preparation for the task of identifying needs. Even in the case of professional educators, there is likely to be a tendency, if confronted with the needs problem without adequate preparation, of responding to needs with the individual's immediate personal problems rather than seeking a broad basis for response.

Another source of information on field needs consists of a wide variety of documents generated by educational practitioners that imply needs although not specifically written to deal with needs. For example, many articles published in the nontechnical education journals are generally written by teachers or educational administrators for a teacher or administrator audience. Such articles often describe problems and needs perceived by the author. Other similar sources of information that may be used to infer the existence of certain perceived needs or unresolved problems include: (1) The inhouse projects and activities of schools and school districts such as those reported to the Far West Laboratory in the activities survey. (2) Project proposals submitted for funding under Title I of the Elementary and Secondary Education Act. (3) Problems and needs expressed by visitors to the Laboratory. (4) Needs statements of Title III Supplemental Centers and Exploratory Centers, and others.

It will be noted that each of these sources is likely to reflect a particular frame of reference or bias. For example, Title I proposals are aimed primarily at educationally handicapped pupils. However, since each of these sources reflects somewhat different biases, composite data from a number of such sources may provide valuable clues concerning field needs in education.

Since a thorough assessment of field needs through evaluation of pupils is not possible at present, field needs data should be regarded as suggestive only. These data, however, probably do reflect true educational needs and even if this were not the case, they certainly reflect the perceptions of persons in the field. These perceptions should be given weight in appraising or reviewing the present situation in any educational area.

Research-Identified Needs

This term is defined as the needs in a given educational area that have been identified by a complete review of research literature in that area. Such needs are generally of two types. First are those needs that are recognized and described by research workers as important problems and deficiencies that must be met in order to move forward both scientific knowledge and field application in the area in question. Second are those needs, problems, and deficiencies that are implied by gaps or weak points in the research that has been done to date. Both are generated from an extensive appraisal of current knowledge in a given area. The only difference is that in one case the researcher explicitly identifies areas where knowledge is deficient and in the other case these other areas are suggested by the reviewer. Research-identified needs may or may not be stated directly in terms of the educational needs of students. In almost all cases, however, these needs would have implications for meeting student educational needs. For example, in team teaching a research-identified problem is the need to learn how teams of teachers may be organized in such a way as to become an effective working group rather than a collection of individuals working at cross purposes. This need has implications for direct student needs since the effectiveness of the team teaching method in meeting student needs will be determined by some degreee by the ability of the team members to work together effectively.

The Situational Review

The first step in advancing knowledge in any field is to make an appraisal of the current situation in that field. This appraisal is generally based upon a thorough review of the research literature in the field and culminates in a careful appraisal of this literature and the presentation of a composite picture of the knowledge we have and the gaps of knowledge that still need to be filled in. Such a picture provides a situational review that gives the investigator a point of departure for subsequent research. In summary, the situational review tells us what we know and explicitly or implicitly suggests things that we do not know within a given discipline.

The Position Paper

The position paper should include both the situational review and the appraisal of research-identified and field needs. Based on the current status of knowledge within the field, the needs identified by researchers and the needs identified or perceived by field practioners, the Laboratory must identify its own position in terms of program areas that may be pursued in order to make a maximum contribution. The position paper probably should not propose specific objectives for the Laboratory within the area under discussion, but instead should identify or suggest several directions that the Laboratory activities could take that are considered promising by Laboratory personnel based on their interpretation of the situational review. Most of these possible courses of action would probably be based primarily on the research-identified needs. In choosing among these research identified needs, however, priority should probably be given to those that also would satisfy a field need.

Some of the suggested Laboratory directions might go considerably beyond the needs of the immediate situation as identified through both research evidence and field information. The situational review may well lead the Laboratory professional staff to identify a long term direction that appears to be important to progress in the field under consideration even though this long term thrust may only be implied by the current situation.

In summary, the position paper would contain four major sections. The first section would introduce the reader to an area of educational activity such as instructional methods and identify the parameters of this area. The second section would summarize what is known about the area or a segment of the area based on a review of research literature. The third section would discuss the knowledge that is needed in the area, based on both the review of the literature and survey of field needs. The final section would reflect the position of the Laboratory; i.e. it would identify possible Laboratory directions in the areas under consideration. Although the fourth section would follow logically the third section, it might well extend beyond the third section in that the Laboratory staff will attempt to visualize directions that are only hinted at by the evidence available in today's literature.

One may regard the Laboratory's position as being supported by a tripod with the three legs being the review of the literature, assessment of needs, and discussion of possible directions. If any of these three supports are weak, the position paper itself will be weak. Without an adequate review of the literature, the investigator can grossly misjudge both the current state of knowledge and the research-indicated needs. Without giving attention to the field needs, the Laboratory could lose the confidence and support of its constitutents even while producing valuable and needed scientific information. The strength of the third leg of the tripod will be determined for the most part by the amount of careful thought devoted to future programs by the professional staff and the interaction among professional staff members. This third leg should go beyond the current knowledge in the field and without very thoughtful assessment of the total area under consideration, these extrapolations may well be faulty.

FIRST POSITION PAPER

INSURING QUALITY EDUCATION FOR ALL STUDENTS

(FULL EDUCATION)

A. FULL EDUCATION AND HUMAN NEEDS

Full education is often defined as a system in which each individual attains the highest level of education commensurate with his ability and in harmony with his needs. Human needs have been the subject of much concern among psychologists, several of whom have developed theoretical structures to describe and classify these needs (McGregor, 1960; Maslow, 1954; Murray, 1938). An understanding of human needs can be of value in defining the goals of full education because such goals must be intimately related to needs. Since psychologists have built most of today's theories of human needs and have conducted extensive research in the broad area of human motivation, it seems advisable to weigh any system of educational goals against our knowledge of human needs. Maslow's needs hierarchy is perhaps the most generally accepted and thoroughly researched of these formulations. His theory states that human needs form a hierarchy in which the lower levels, such as physiological needs, are the most potent motivators when they are not satisfied. When these lower needs are satisfied, however, the individual devotes more and more effort to the satisfaction of the higher needs such as the need for self-actualization. The main needs in Maslow's hierarchy starting with the most basic needs, are:

1. The physiological needs: - hunger, thirst, air, etc.;
2. The safety needs: - freedom from threat, danger or insecurity;
3. Affiliation: - need for affiliation, belonging, acceptance;
4. Esteem: - need for achievement, competence, reputation, stature, prestige;
5. Self-actualization: - need for self-fulfillment, realization of potential;
6. Cognition: - need to know and understand;
7. Aesthetic: - need for symmetry, order, system and structure.

B. THE GOALS OF FULL EDUCATION

In most cases, the stated goals of full education can be combined into three areas (Gagne, 1966):

1. Goals related to the individual's vocational development;
2. Goals related to the individual's social development, most generally as required for assuming the role of a citizen;
3. Goals related to the individual's self-fulfillment.

These goals closely parallel the hierarchy of human needs as postulated by Maslow. Vocational goals aim primarily at meeting physiological and safety needs, although all of Maslow's categories can be satisfied to some extent through the attainment of vocational goals. Similarly, affiliation and esteem needs relate primarily to the social development goal; and the self-actualization, cognitive and aesthetic needs relate to educational goals leading to self-fulfillment.

The problem of attaining the goal of full education is so broad as to defy an adequate definition. Yet, an attempt to sketch out the parameters of the problem as exhaustibly as possible seems essential if we are to locate the Laboratory effort within the broad scope. Thus, we have listed below some of the goals that must be met on the road to full education. These goals are of fundamental importance to education and each is broad enough to imply many specific problems within it. The reader should note that this list represents only one way to organize the area of full education*. There are certainly other ways to organize this area as exemplified by the California Framework Committee (1950), Conant (1959), Gardner (1960) and The National Education Association (1964). However, these various statements have much in common and seem to reflect a surprising concensus among informed individuals and groups concerning the broad goals of education. The list we have selected, although the product of a great deal of careful planning, may not touch all unmet needs that stand in the way of full education but it is broad enough to acquaint the reader with the magnitude of the overall task:

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* Adapted from the Pennsylvania Committee on Quality Education as reported in Educational Testing Service, A Plan for Evaluating the Quality of Educational Programs in Pennsylvania, Vol. I, Basic Program, Princeton, N.J. E.T.S., 1965.

1. SELF-UNDERSTANDING AND ACCEPTANCE:

Full education should help every child acquire the greatest possible understanding of himself and an appreciation of his worthiness as a member of society.

Self-understanding should increase as the child matures. That is, he should become increasingly aware of his strengths and weaknesses, his values and interests and aspirations, so that the decisions he makes about his educational occupational future will be informed, reasonable and rational. He should know the strengths in himself that he should exploit and the weaknesses that he should try to overcome or that he must learn to live with.

On the other hand, regardless of the level and pattern of his particular talents, the school experience should be such that it will strengthen, not damage, his self-esteem.

2. INTERGROUP ACCEPTANCE:

Full education should help every child acquire understanding and appreciation of persons belonging to social, cultural, and ethnic groups different from his own.

The school experience should be such that the child will learn to respect and achieve an easy interaction with children who differ from him in physical characteristics, in cultural traditions, economic status, religious beliefs, manner of speech, and degree of intellectual competence.

3. MASTERY OF BASIC SKILLS:

Full education should help every child acquire to the fullest extent possible for him mastery of the basic skills in the use of words and numbers.

These basic skills fall into four broad categories: (1) the ability to acquire ideas through reading and listening, (2) the ability to communicate ideas through writing and speaking, (3) the ability to handle mathematical operations, (4) the ability to reason logically and to respect evidence. The level of performance that can be reasonably expected in each of these areas will vary from child to child.

4. MOTIVATION TO LEARN:

Full education should help every child acquire a positive attitude toward school and toward the learning process.

The school experience should be such that the child finds the learning activities associated with it enjoyable and rewarding to the point that he is motivated to do well and to continue learning on his own initiative beyond the requirements of formal education. Everything possible should be done to ensure that the attitude of the teacher, the atmosphere of the school, and its physical condition shall contribute toward this end, so that the individual will hold education high among his values.

5. CITIZENSHIP AND SOCIAL COMPETENCE

Full education should help every child acquire the habits and attitudes associated with responsible citizenship and acceptance of his role in society.

Of first importance among such habits and attitudes are: (1) loyalty to the fundamental principles of a free democratic society as expressed through a readiness to defend its institutions, to bring rational criticism to bear on their defects, and to work for changes leading to their improvement, (2) effective participation in group activities by assuming the role of a leader or a follower as appropriate, (3) appreciation and acceptance of the necessity for earning a living, (4) acceptance of the basic ethical values that make group living possible--values characterized by such terms as honesty, fair dealing, and compassion for the less fortunate.

6. PHYSICAL AND EMOTIONAL HEALTH:

Full education should help every child acquire good health habits and an understanding of the conditions necessary for the maintenance of physical and emotional well-being.

In his own interest as well as in the interest of society at large, a child should know how to take care of himself and how to keep himself physically fit. He should know what the requirements are for physical and mental health and what practices, harmful to health, should be avoided. Mere knowledge of these matters, however, is not sufficient. In cases where the home has been deficient in encouraging the child to practice sound health habits, the school should remedy the deficiency.

7. FOSTERING CREATIVITY:

Full education should give every child opportunity and encouragement to be creative in one or more fields of endeavor.

Creativity is defined here to encompass worthwhile activities that a child initiates and pursues on his own--activities having an outcome that is perceived by the child himself and by others as a contribution to some part of his world. Such activities can be included in a wide variety of fields, not only the sciences and the arts but also the organization of human affairs and the development and exercise of salable skills in the production of any of a host of practical things that enrich our way of living.

It is expected that many children, if given the chance, will become involved in exploring ideas and ways of doing things that are new and exciting within their own world. The school should provide this kind of rewarding experience for all children, and should judge its success by its ability to evoke in children a flexible and creative approach to human affairs.

8. VOCATIONAL PRODUCTIVITY:

Full education should help every child understand the opportunities open to him for preparing himself for a productive life and should enable him to take full advantage of these opportunities.

This goal implies that most children can profit from some form of education beyond high school, whether it be at a four-year college, a school of nursing, a community college, a technical institute, or the like. The youngster should be aware of these opportunities and seek out the particular kind of education best suited to his talents and interests. This goal also implies that the school will provide the child with the kind of guidance that will enable him to do so.

Furthermore, the school should help him discover the practically unlimited possibilities for continuing self-development both in the world of work and in the world of the mind so that he will be motivated to pursue excellence in all the forms of human endeavor that are appropriate for him.

9. INTELLECTUAL DEVELOPMENT:

Full education should help every child to understand and appreciate as much as he can of human achievement in the sciences, the humanities, and the arts.

Insofar as possible every child should gain from his school experience an increasing openness to the life of the mind and an increasing ability to find meaning for his own life in the heritage of the past and in the intellectual of the present age. He should achieve some understanding of the transforming conceptions of modern science. He should achieve increasing mastery over the basic principles of social and psychological sciences. He should develop a degree of sensitivity that enables him to differentiate the worthy from the worthless in the multifarious products of civilization as we know it--books, motion pictures, radio, television, music, and the visual and performing arts, architecture, industrial design, and the like.

10. CONTINUING EDUCATION:

<u>Full education should help every child to prepare for a world of rapid change and unforeseeable demands in which continuing education throughout his adult life should be a normal expectation.</u>

The explosion in knowledge, the impact of science on the economy, the almost unpredictable nature of the job market for both the short term and the long term, the increase in opportunity for leisure-time activities--all these developments make it apparent that education, if it is to fulfill the life-long needs of the individual and the future needs of society, cannot stop at grade 12 or grade 14 or grade 16. Such continuing education may take many forms: it may be self-education, it may be formally organized retraining, it may be adult classes of a recreational nature. Whatever the form, it must be regarded as an essential of an individual's activity through his adult life if he is to keep up to date as a worker, as a citizen, and as a person.

Although each of these goals contributes to all three of the aforementioned broad goal areas, it is possible to relate each primarily with one of the broad areas. This has been done in Figure I.

C. CRITERIA FOR SELECTING LABORATORY PROGRAMS AND PROJECTS IN FULL EDUCATION

It appears unlikely that the goal of full education for all citizens can ever be reached. However, this does not alter the importance of the goal or the desirability of trying to approach it ever more closely. Certainly, for some individual citizens the goal is being reached, or closely, within today's educational structure. For the vast majority, however, the educational institutions of today appear to be falling somewhat short of this goal and for a minority, they are failing almost completely.

Since the task of full education is an overwhelming one and the resources of the Laboratory are limited, it appears reasonable for us to identify certain aspects of the problem for attack. What criteria should be applied to the many facets of this problem in order that we may identify those to be studied by the Laboratory?

We would suggest that problems selected for study should generally meet the following criteria:

1. Be concerned with characteristics of the individual or the situation that appear to be fundamental to the realization of the goal of full education. Variables that have an effect upon all or nearly all aspects of education are considered fundamental.
2. Be concerned with all three of the basic areas of full education, i.e., vocational development, social development, and self-fulfillment.
3. Be concerned with areas where today's educational institutions appear to be seriously failing to reach the goal of full education.
4. Be concerned with individual citizens or groups whose needs appear to be least well met by today's educational institutions.
5. Be concerned with the problems that offer a reasonable chance of solution or conditions that offer a reasonable chance of improvement within the next five years, using the resources that the Laboratory is likely to have at its disposal.
6. Be concerned with problems that are not receiving adequate attention from other research activities.

These criteria can be applied at least in part to both programs and projects related to the goals of full education.* After a program has been adopted, the program staff will usually be able to identify more than one project sequence that could lead to the achievement of the program goals. Thus, criteria will be needed to make sound decisions both at the program level and the project level. Similar sets of criteria must eventually be developed for each of the Laboratory programs.

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* It appears appropriate at this point to define "program" and "project." Program is defined as a broad, closely integrated effort directed at the attainment of one or more major long term educational objectives.

"Project" is defined as a carefully planned activity or sequence of activities that advances the laboratory one step towards the achievement of one or more program objectives. A project may be designed to contribute to the advancement of one program or several programs. The efficiency of a project may be judged in part by its success in advancing several programs by recognizing and exploiting program interrelationships and minimizing unnecessary duplication of effort.

D. PROPOSED AREAS OF INVESTIGATION

The next step in preparing this paper was to apply the criteria developed in the previous section to problems related to full education and identify one tentative project that meets all or most of the criteria.

The laboratory proposes for consideration as a tentative project the development of techniques to evaluate the effectiveness of the total school-related educational experience of the individual. This proposed project would thus have as its outcome the assembly and development of a battery of measures that would sample pupil behavior in all major educational areas contained under the 10 broad objectives of full education. This area has great potential for developing into a highly efficient project as defined on page 10.

When this proposed project is weighted against the aforementioned criteria, there appears to be ample evidence that it meets an important and pressing need not only for the full education program, but for all 3 of the laboratory's research and development programs.

First, it is perhaps the most fundamental problem that must be solved before we can move on towards the goal of full education. Without a full array of measures such as this program would develop, we cannot determine where we are currently located on the road to full education. We cannot decide what areas require the greatest attention. Neither can we record the degree and extent of future progress nor learn when the program goals have been attained.

Being fundamental to the very study of the problem of full education, this project is obviously concernedwith all 3 of the basic goals of full education and would provide information needed for all educational groups.

There is considerable evidence that the schools are failing in their present evaluation programs. Most educators have developed no behaviorally oriented educational objectives and as a result they have only the most vague idea of what they should be evaluating. Also, educational evaluation programs are typically limited to measures of achievement and scholastic aptitude. The broad goals of full education are not generally covered by such measures except for mastery of basic skills and intellectual development. The weaknesses of school evaluation procedures were brought out very clearly during the past year when the schools attempted to set up evaluation programs as required for ESEA Title I proposals. These efforts revealed that few school districts had personnel who could develop behavioral objectives or translate these objectives into measurement procedures.

The more sophisticated programs such as those conducted by university research workers and Title III Centers have been similarly handicapped simply because there are no satisfactory measures and only a few measures of any kind in some of the areas of full education. In reviewing the 10 broad educational goals, we find that those objectives concerned with affective behavior or having a major noncognitive element such as self-understanding, self-acceptance, citizenship and social competence, and motivation to learn cannot be measured adequately with today's tools. In spite of these deficiences, however, the technology of educational measurement is well in advance of the current application of this technology by the schools. Thus, it seems likely that a first step in the proposed project, namely that of pulling together and classifying the measures currently available, can make a significant contribution to current educational practice.

Although serious soft spots will exist in any profile of full education based upon current operational measures, the situation is far from hopeless, since the field of behavioral science measurement has been making significant gains in recent years. The measurement of complex behavior through situational testing that was pioneered by the OSS Assessment staff during World War II (Guetzkow, 1951) and recently brought to new levels of objectivity and efficiency by Hemphill, Griffiths, and Fredericksen (1962) shows promise for the evaluation of educational objectives. Vigorous work in creativity (Torrance, 1965), attitudes (Festinger, 1957), and motivation (Cattell, 1964) also is producing measures that may soon provide valid data in these difficult areas. The naturalistic approach to measurement, although just gaining momentum, also seems likely to provide valid measures in areas where past efforts have been limited to self-report techniques.

These new approaches, however, are being developed for the most part by behavioral scientists rather than educators and little current research and development has been directed towards adapting such techniques to evaluate pupil behavior in the educational context. Even the National Assessment Program for education that is currently being developed is limited to eleven subject-matter oriented fields, only two of which, citizenship and social studies, have any affective implications (Merwin, 1966).

In summary, the proposed laboratory project appears to satisfy all of our criteria. It is concerned with a problem that is fundamental to future progress in any program of full education which is not being met by today's educational institutions but shows promise of attainment within a reasonable time by adapting and developing measurement technology already in existence in the behavioral sciences. Furthermore, it appears likely that if plans for this project are fully developed, the project will provide measures that will advance the curriculum program and the instructional methods program as well.

E. A FURTHER CONSIDERATION IN PROGRAM SELECTION

A serious problem in any research and development activity arises from the effects that such activities have upon the participating schools. Very often a research program in a specific educational area, although having great merit in itself, can over a period of time distort the total educational program of the cooperating schools. This distortion comes from the great emphasis placed on the program area and the gradual development among teachers and administrators of the belief that this area is of overwhelming importance and should receive a great share (and often more than its deserved share) of the available educational resources. This problem does not apply to all educational research and development enterprises, but does apply to those enterprises in which some aspect of the school's curriculum or methods is given an unusual amount of attention because of a research and development project.

There are two effective ways of meeting this problem: (1) work in research and development areas that, although important, have a relatively small apparent impact on the school's activities, or (2) attempt to move the educational program forward across a broad front rather than in a single narrow area. In terms of the area of full education, the second approach has much to recommend it.

TABLE I

NUMBER OF MEASURES IDENTIFIED IN THE SIXTH MENTAL MEASUREMENT YEARBOOK THAT APPEAR TO BE RELATED TO EACH OF THE 10 BROAD GOALS OF FULL EDUCATION*

	K-3	4-6	7-9	10-12	13+
1. Self Understanding & Acceptance	46	58	70	64	75
2. Intergroup Acceptance	1	8	19	38	64
3. Mastery of Basic Skills	90	104	137	120	66
4. Motivation to Learn	0	0	1	2	2
5. Citizenship & Social Competence	0	5	15	24	32
6. Physical & Emotional Health	26	25	29	29	30
7. Fostering Creativity	0	2	8	8	9
8. Vocational Productivity	1	9	43	74	205
9. Intellectual Development	2	14	40	72	47
10. Continuing Education	0	0	0	0	0

* Since some measures can be applied at more than one grade level, the total number of entries exceeds the total number of measures.

TABLE 2

CLASSIFICATION OF SIXTY EXPERIMENTAL MEASURES
INTO THE 10 BROAD GOALS OF FULL EDUCATION*

	K-3	4-6	7-9	10-12	13+
1. Self-Understanding & Acceptance	2	6	10	9	8
2. Intergroup Acceptance	1	1	1	2	2
3. Mastery of Basic Skills	0	0	0	0	0
4. Motivation to Learn	2	3	3	2	3
5. Citizenship & Social Competence	2	2	1	4	9
6. Physical & Emotional Health	2	3	4	6	13
7. Fostering Creativity	2	2	2	2	2
8. Vocational Productivity	0	0	0	0	5
9. Intellectual Development	1	3	0	0	0
10. Continuing Education	0	0	0	0	1

* Since some measures can be applied at more than one grade level, the total number of entries exceeds the total number of measures.

F. THE PROJECT: OBJECTIVES AND TENTATIVE PROCEDURES

The reader should note that this section does not purport to be a finished project proposal, but is instead a brief tentative description of a new project which, if considered worthy of further effort by the Executive Panel, could be developed into a formal proposal within the next three to four months.

Simply stated, the proposed project would attempt to achieve 3 objectives. The first objective would be to obtain a preliminary estimate of the evaluation resources available that could provide evidence on each of the 10 broad goals of full education that were stated earlier in the paper. In this phase which would probably be carried out on an "inhouse" basis, a number of major sources of information on educational measures would be checked and the measures that were located would be tentatively allocated to one or more of the broad educational objectives. A preliminary inventory of the measures related to each of the 10 areas has been conducted in preparing this paper. The findings are summarized in Table 1. A brief discussion of the measurement picture for each of these areas also has been provided in the next section to give an estimate of the current state of the art in this area.

Once these preliminary data are made available to the schools for use as an interim evaluation guide, the Laboratory resources can be directed towards the establishment of more valid tools. This step, however, must await the achievement of the second objective which is to develop under each of the 10 broad educational goals a series of major behaviorally oriented objectives which will reflect more precisely the total area of full education. The outcome of this step could well be a revised handbook listing of all the behaviorally oriented objectives that have been evolved under each of the 10 broad goals (probably about 100) and indicating available measures for each such objective.

At this point, we would have a fairly specific picture of the strengths and weaknesses of the educational measurement resources available for use in providing an overall assessment of the total educational goals of the schools. Weak points in the evaluation areas could then be pinpointed rather clearly.

Although it seems apparent that minimally acceptable measures will not be available to measure the attainment of all behaviorally oriented objectives, the data gathered up to this point in the program can be of value to the Laboratory's constituents in a number of ways. It would be possible, for example, for a school district desiring an evaluation program to submit their specific operational objectives to the laboratory.* These objectives could be coded in terms of the behaviorally oriented objectives mentioned above and data processing equipment could be employed to provide the school district of a printout of available measures that could be used for each of their stated objectives. Such a service would provide the schools with a strong incentive to build behaviorally oriented objectives they most now lack. It would be possible to carry this service one step further by making available to a school microfiche cards giving essential information on each measure that school personnel wanted to consider further in the assembling of their full education assessment battery. The microfiche card could contain a copy of the measure, a copy of the test manual, references dealing with the use of the measure, information on where the measure could be obtained, its cost, administrative requirements and other information found to be generally needed by educational personnel.

The applications of such a source file may be summarized as follows:

a. Identification of measures for a total assessment of the school's educational program.

b. Establishment of the school's educational needs by having the school personnel compare their operationally stated objectives with their current status based upon the results of measures supplied by the laboratory. The difference between the levels of performance specified in a set of broad based behaviorally oriented

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* It is recognized that most schools do not currently have such objectives. Developing such objectives could evolve as a project supporting the Education of Teachers program.

operational objectives and the levels of performance actually reflected by the assessment battery would provide a highly valuable procedure for defining the school's educational needs.

c. Development of evaluation of programs for projects carried out by the schools under ESEA Title I. Most schools have experienced great difficulty in assembling satisfactory measures for evaluating the outcomes of their Title I projects. The information provided by the proposed laboratory program would greatly reduce this problem for the school districts. It would also permit broader and more imaginative Title I proposals since past proposals have been severely limited by the inaccessibility of suitable measures to attack many important educational objectives, especially those in the non-cognitive or affective realms.

d. The proposed evaluation battery could serve a similar function in assisting other research and development enterprises such as ESEA Title III Centers, ESEA Title IV Research and Development Centers, and individual researchers in the behavioral sciences.

The third objective in this program would be to develop evaluation tools in areas where the assessment indicated that no satisfactory tools were currently available. It would be necessary at this point to establish a somewhat more rigorous set of criteria for deciding the degree to which a specific measure was satisfactory for the evaluation of a specific behavioral objective. Available measures would then have to be weighed against these criteria. Specifications based on the aforementioned criteria plus the special needs within each operational objective would be prepared and procedures would be set up for developing satisfactory measures.

It is doubtful that the resources of this Laboratory would ever be sufficient to attack that total problem of developing all of the needed measures. However, in many cases it would probably be possible to identify development efforts of scientists outside of the laboratory that appear to be making significant progress towards developing some of the measures needed. It would also be possible to develop satisfactory measures in areas where no ongoing research and development efforts appear to offer a promise of success through contracts with universities and test companies. Finally, an inhouse laboratory effort could be launched to develop measures in areas where qualified individuals or organizations could not be located to contract for instrument development.

G. SUBSEQUENT STEPS IN THE LABORATORY PROGRAM

The development of a broad assessment battery that would permit evaluation of any school's full educational program, although an extremely large and important task, does not represent the ultimate full education goals of the laboratory or of society. Ideally, after evaluation tools have been developed, the laboratory and many other agencies for educational research, development, and change could apply these instruments in many ways in order to describe the current state of affairs in education, to identify variables in the situation that can improve this state of affairs and finally to test the variables identified in an experimental setting to bring about the improvements desired. This would represent the final step in the research program which would then be followed by development and dissemination programs leading to the realization at an operational level of the national goal of full education in both the schools and the society. Realistically, this laboratory could achieve only a small part of the overall goal of full education, but since much research effort throughout the nation is being directed toward different aspects of this goal, full education, if taken as a challenge to the total society, is not beyond reach. To illustrate how one area within this long range program could be carried to an ultimate conclusion, we have selected the problem of improving pupil attitudes towards the schools and have carried this problem in a preliminary fashion through the steps described above.

H. PRELIMINARY ESTIMATE OF CURRENT MEASUREMENT RESOURCES

In this section, the first steps described in Section F will be carried out. Measures described in the Sixth Mental Measurements Year Book (Buros, 1965) have been tentatively classified under the 10 broad goals of full education and for each of these goals the number and type of measures have been classified into 5 educational levels as follows: Primary grades (k-3); intermediate (grades 4-6); junior high school (grades 7-9); high school (grades 10-12); post high school (grades 13 and above) (see Table 1).

A review of recent measurement trends and classification of 60 experimental measures currently being developed (Table 2) has also been conducted to help form the basis for a brief assessment of the current status of measures under each of the 10 broad educational goals. It should be emphasized that the data in Tables 1 and 2 were assembled rather hurriedly and can be taken as nothing more than a rough estimate. Many of the measures listed in Tables 1 and 2 cover substantially the same areas, while important related areas may not be covered at all. Many measures listed under a given goal, although related to that goal, do not get at the more critical or central problems. Thus, a deeper appraisal may locate more deficiencies than are suggested by Tables 1 and 2 and conversely may find new and promising measures not located in the preliminary survey.

1. SELF-UNDERSTANDING AND ACCEPTANCE

Many psychological measures in areas related to personality and adjustment can provide information that is to some degree related to this broad goal. Such instruments as the Mooney Problem Checklist (1950) and the SRA Youth Inventory (Remmers, Shimberg, & Drucker, 1949) can measure problem related self-understanding. Many personality inventories such as the MMPI (Hathaway and McKinley, 1951), the California Psychological Inventory (Gough, 1960), and the 16PF (Cattell and Eber, 1962), can, with the help of well trained counselors, contribute significantly to both the measurement and further development of the individual's understanding of himself. Projective personality measures such as the Rorschach Ink Blot Test, (1951), and Murray's Thematic Aperception Test (1943) can, in the hands of a qualified clinician, also contribute significantly to the individual's self-understanding while avoiding some of the problems inherent in self-report measures such as the personality inventory. Many of the established measures of both the projective and inventory type in this area have been researched extensively.

For example, Buros (1965) lists over 3,000 references dealing with the Rorschach Test and nearly 1400 references dealing with the Minnesota Multiphasic Personality Inventory. Perhaps the most serious problem involved with the use of such measures is the level of training required for competent interpretation of the test results.

Other tools can, when utilized in the counseling situation, and in both developing and measuring the pupil's self-understanding, include various intelligence or scholastic aptitude measures, vocational interest measures, vocational aptitude batteries, study skills measures, and others. It should be noted, however, that these measures for the most part can only estimate the pupil's self-understanding and acceptance if employed by a trained counselor.

Relatively few measures are available that purport to provide a direct appraisal of the pupil's self-understanding and acceptance without the aid of the counselor or clinician. Measures that can provide such information include the various self-concept tests, nearly all of which are still in the experimental stages. Perhaps the most widely used of these measures is the Index of Adjustment and Values (Bills, Vance, and McLean, 1951). This measure provides scores in self-concept, ideal-self, and acceptance of self. Several similar experimental measures are currently available.

In summary, a wide range of measures than can be used by a trained counselor or clinician to appraise self-understanding and acceptance is available. Few public school counselors can interpret these measures effectively. Self-concept measures are mostly in the experimental stages and tend to measure self-understanding through global self-report techniques that are of doubtful validity. Few measures provide estimates of self-understanding in specific areas although some such as developed by Sears (1963) provide such information relative to the schools.

2. INTERGROUP ACCEPTANCE

There are a number of available measures in areas that relate to inter-group acceptance. These include measures in such areas as foreign language, social studies, and geography. Most of these measures, however, do not provide a direct appraisal of the pupil's level of intergroup acceptance and thus are of limited use in measuring this objective. More direct measures of intergroup acceptance are very limited. Perhaps the most widely encountered type of instrument that provides a direct appraisal of intergroup acceptance is the self-report attitude scale. Scales have been developed to measure attitudes toward a wide range of attitude objects. Such scales, however, are not usually published by regular test companies and are therefore not easily available to the schools. Also, most such scales are based on direct self-reporting techniques that are highly susceptible to faking or distortion by the respondent. Available evidence suggests that the individual's self-reported attitudes are often not closely related to the attitudes that appear to be suggested by his behavior. Thus, the self-report attitude scale as a measure of intergroup acceptance, although minimally satisfactory in most cases, does not provide a fully satisfactory instrument for measuring this important goal. Current experimental work such as Cohen's projective measure of school attitude (1965) may produce more effective measures within the next few years.

3. MASTERY OF BASIC SKILLS

Of the categories contained under this broad goal, measures in reading and mathematics achievement are the easiest to devise and many such measures are currently available at all grade levels. Considerably fewer measures, but at least some that could be considered minimally satisfactory, are available to measure listening and speaking. In the area of logical reasoning and problem solving, however, very little except experimental measures are available at this time. In these areas, however, almost nothing is available for the primary grades. In reading, writing and mathematical operations, although a great many standardized achievement tests are available, the majority of such tests measure at the lowest levels of Bloom's Cognitive Taxonomy such as knowledge and comprehension and contain little that appears to measure some of the higher cognitive levels such as analysis, synthesis, and evaluation (Bloom, 1956). In summary, it appears that minimally acceptable measures are available in all sub-areas related to the mastery of basic skills with the problem solving area being the weakest.

4. MOTIVATION TO LEARN

Several types of measures, most of which are still experimental, are currently available to provide estimates of the pupil's attitude toward school and motivation toward learning. A number of self-report scales such as those developed by Sears (1963) and Borg (1966) provide measures of attitudes toward school, teachers, education, and related concepts. A number of less direct measures of attitudes toward school have also been developed but are highly exploratory at the present time (Borg, 1962).

Another family of instruments related to this objective are the various measures of achievement motivation stemming mainly from the work of McClelland and Atkinson (1948) and Atkinson (1958).

Cattell's recent research on motivation (1964) and his Motivation Analysis Test, although less directly related to the learning situation, can provide valuable evidence in this area. A high school form of this measure is currently in final stages of development and a children's form is in the preliminary development stages. Some of the currently available personality measures, although not dealing directly with motivation to learn, do provide scores on related areas. The SRA Junior and Youth Inventories, for example,contain a section on school problems. The California Psychological Inventory (Gough, 1960) provides two scores related to achievement motivation. The California Test of Personality provides a score on school relations (Thorpe, Clark, & Tiegs, 1953).

In summary, a number of currently available measures relate reasonably well to the area of pupil attitudes and motivation to learn. Most of these instruments, however, are of the self-report type and since the pupil may feel some pressure to fake his attitudes towards school, especially if the measure is administered in the school situation, the development of less direct measures with higher levels of construct validity would be a very worthwhile project.

5. CITIZENSHIP AND SOCIAL COMPETENCE

Most currently available measures in the areas of citizenship and social competence are self-report devices which are probably suitable for measuring knowledge about citizenship and social competence, but are of doubtful value in appraising the behavior of the individuals tested. Citizenship appears to be an area in which pupils can develop a knowledge without this knowledge having any apparent effect upon their behavior. There have been, however, experimental approaches to the measurement of citizenship that attempt to measure more than mere recall of citizenship information. The recent work of Oliver and Shaver (1966) has lead to the development of two measures that attempt to appraise the pupil's skill in evaluating political arguments relative to important social and political issues in our culture. These tests do not measure knowledge per se but appear to require the pupil to complete a number of problem solving steps in order to respond to the written situations presented in the test.

An early effort to develop more realistic forms of citizenship measurement was involved in the Citizenship Education Project (Friedricks, 1953) at Columbia University. More recent efforts aimed at obtaining objective estimates of citizenship behavior have been conducted by Borg (1964 a & b). This series of measures involve the use of written situational tests, pupil reactions to televised citizenship situations, and use of the Guess-Who Technique in the appraisal of citizenship behavior.

In the area of social competence, a number of social studies achievement measures touch on the topic of citizenship. The STEP Social Studies Test (1957) is probably the best of these measures currently available since it focuses on critical skills and understandings in the social studies area rather than recall of factual material only.

Many of the personality and adjustment inventories also provide data on social competence and social adjustment. Siegel's Biographical Inventory for Students (1962), for example, provides scores on social activities, religious activities, political activities, and social conformity. The Cain-Levine Social Competency Scale (Cain, Levine, & Elzey, 1963) provides similar information for mentally retarded children. Most of the major personality inventories provide at least one score that is related to the area of social competence and social adjustment.

6. PHYSICAL AND EMOTIONAL HEALTH

The area of Physical Health is covered reasonably well by currently available measurement procedures. Many of these measures are performance tests such as the AAHPER Youth Fitness Test (1960) which provide a well rounded estimate of physical fitness and may be applied at ages 10 to 30. Other measures in this area deal with knowledge of physical hygiene and health habits such as the College Health Knowledge Test (Dearborn, 1959) and the Health Behavior Inventory (Yellen, et. al, 1962). Other measures currently available are designed to measure specific physical or other health variables such as hearing, vision, smoking habits, and color blindness.

Many of the personality inventories and projective personality measures provide scores which purport to measure the individual's emotional health. For example, the Guilford-Zimmerman Temperament Survey (1949) provides a score on emotional stability, as does the IPAT Children's Personality Questionnaire (Porter and Cattell, 1959). Nearly all of the projective techniques are aimed at the assessment of various aspects of mental health and adjustment, and being somewhat more clinically oriented than the inventories, usually provide scores on specific mental health or adjustment difficulties.

In summary, a number of widely used and reasonably sound measures are available to appraise the areas of physical and emotional health. Current tests are probably least adequate in appraising good health habits since most tests in this area are of the self-report type and can therefore be distorted by the respondent who wishes to create a favorable impression.

7. FOSTERING CREATIVITY

A great deal of attention has been given in recent years to the problem of fostering creativity in the public schools. The most extensive work in this field has been done by Torrance (1965), Taylor (1964), and Guilford (1950). The measurement of creativity has been a challenging area and many of the early efforts to study the creative process such as the work of Osborne (1948, 1957) were seriously limited by the lack of valid measures. The first major systematic study of the measurement of creativity was carried out by

J. P. Guilford and his colleagues and resulted in the development of several measures of creative behavior that have been available in published form for a number of years.

Guilford's factor analysis of creative behavior (Guilford et al., 1951) provided many new insights into the area of creativity, formed the basis for Guilford's tests and has influenced the work of later researchers in this field. Torrance's Test of Imagination, Form D (1965) has drawn heavily on some of Guilford's earlier work. However, Torrance's measures have been applied much more widely to pupils at all age levels in the public schools. Four of the sections on Torrance's test, Product Improvement, Product Utilization, Unusual Uses, and Circles are scored for fluency, flexibility, and originality. The Ask and Guess Test is scored for fluency and adequacy of response only. Inter-scorer reliability coefficients on the various subtests in Torrance's battery range from .84 upward, with most coefficients above .90. Torrance's research has provided considerable evidence concerning the validity of his measures (1965).

In summary, basically satisfactory measures of several aspects of creativity applicable to all public school levels have become available within the past year or two. Since several major research programs are currently devoted to the area of creativity, it may be expected that improved measures may continue to emerge.

8. VOCATIONAL PRODUCTIVITY

There is a wide variety of standard measures in the broad area of vocational evaulation. Most of these measures, however, are concerned with measuring either aptitude or skills for specific vocations, such as bookkeeping, shorthand, typewriting, agriculture, teaching and industrial arts. There are virtually no measures currently available that are designed to help the individual understand the opportunities open to him in the vocational realm. Vocational aptitude batteries can, in conjunction with counseling, help the student gain insights into his strengths and weaknesses in the occupational context. Some experimental measures provide a start at attacking the degree to which the individual understands his vocational opportunities.

Among these are an aptitude self-concept test developed by Borg (1966) and the Occupational Information Test developed by Borg and Cragun (1966). Since the need for such measures is generally recognized by vocational specialists, counselors, and psychologists, it appears there is some likelihood that other experimental tests not located in this preliminary survey are available in this area. However, based on our preliminary data, we must conclude that at this time there are probably no fully satisfactory measures available to the school that will measure the degree to which the school is achieving the goal of vocational productivity as defined in this position paper.

9. INTELLECTUAL DEVELOPMENT

As defined in this position paper the area of intellectual development takes in most of the fields of human achievement outside of the basic skills and covers a major aspect of the usual public school curriculum. Achievement measures are available in virtually all of the areas contained under the broad heading of intellectual development although, because of the nature of the curriculum, these measures often do not cover the entire range of public school grades. In the biological and physical sciences and history, basically satisfactory achievement measures are now available at least at the secondary level. Few measures however are available in these areas in the elementary level and almost nothing for the primary grades of the elementary school. Since many schools now have developed objectives that call for work in these areas at the elementary school level, it appears that much further work is needed to develop adequate measures below Grade 7. A major amount of effort, however, is now being made in these fields and it is likely that experimental tests appropriate for the elementary school are currently in existence, although such tests were not located in our preliminary survey. In the behavioral sciences and fine arts, there are few satisfactory measures of achievement at any level, although some minimally satisfactory measures are available. Again these measures aim primarily at the secondary school and college level.

A major problem with many of the established achievement measures now available in areas such as the sciences is that rapid and extensive changes in the curriculum have taken place in recent years that make many standard measures inappropriate. In summary, although minimally acceptable measures in the area of intellectual development are available for the physical sciences and some of the humanities and the fine arts, such measures are generally not available in the behavioral sciences. Since many established measures in the physical sciences do not fit new curriculum developments, there appears to be a major need for additional test development if we are to obtain an adequate appraisal of achievement for the broad goal of intellectual development.

10. CONTINUING EDUCATION

The broad goal of continuing education as defined in this paper includes two major elements. The first of these elements is concerned with the degree to which students accept the concept of continuing education as a life-long necessity in our society. The second element is concerned with the degree to which the public schools are successful in helping each individual to prepare for a world of rapid change and unforeseen demands. Although some limited experimental efforts have been made to measure this broad educational goal, the preliminary survey did not uncover any reasonably complete measures even at the experimental level. The first aspect of continuing education probably could be measured with reasonable validity using straightforward self-report techniques. The second area, however, concerned with determining the degree to which an individual is prepared to adapt himself to rapid change and unforeseen demands poses somewhat difficult measurement problems. In summary, there are virtually no measures now available to determine the degree to which schools are attaining this broad education goal.

I. The preceeding sections sketch out the broad area of full education, suggest criteria for selecting Laboratory programs, apply these criteria to a tentative area and briefly describe a project that could be developed further and subsequently be undertaken by the Laboratory. The final section of this paper is designed to give the reader a preview of the total long term trust of the Laboratory by taking one of the 10 broad educational goals, Motivation to Learn, and carrying the plans for <u>one aspect of this goal</u> to their logical conclusion. Since time has not permitted the exhaustive review of previous research that would be needed to build such a program in final operational form, this section should be regarded as a <u>sample</u> that can illustrate the form in which plans for the total area of full education might ultimately be cast. The problem that we have selected for this illustration is that of developing more favorable pupil attitudes toward the school.

When this problem is weighed against the criteria given in Section C, we find at every hand evidence that the attitudes of pupils toward today's schools leave much to be desired. A recent article dealing with the New York City school system reported that student attacks on the persons of teachers occur on almost a daily basis. The large number of dropouts that has caused such great national concern in recent years is further evidence that many students have strongly negative attitudes toward today's schools.

The most negative attitudes toward the schools appear to be held by individuals from culturally deprived groups - the very groups whose members fall most short of the ideal of full education.

The pupil's attitudes toward the school influence his perception of all of his school-related experience. The mechanism of selective perception and selective retention that have been so well demonstrated in psychological research tell us that the pupil having negative attitudes toward the school will tend to see and remember those aspects of the school situation that support his negative attitude and overlook or forget those aspects of the school situation that are likely to lead him to break out of this vicious cycle of constantly reinforcing his negative perceptions of the school. This phenomenon is partially explained by Festinger's theory of cognitive dissonance (1957) and the research evidence supporting this theory.

The changing of attitudes is an extremely difficult problem in psychology, but some gains have been made in this area in recent years. Perhaps a more fruitful approach to the negative attitudes of culturally deprived children, however, may be made by learning how these negative attitudes develop and removing or changing the circumstances that have brought them about.

The gains in theory formulation in the area of attitudes has been matched by the development of promising measurement techniques. It is no longer necessary to rely wholly upon direct attitude scales of the Thurstone and the Likert types. In recent years, behavioral indicators of attitude, situational tests and projective techniques have been developed that appear much more promising as undistorted measures of attitude. Such indirect approaches as Osgood's Sematic Differential technique (Osgood, et al, 1957) have also been employed in attitude measurement. Thus, the state of the art seems to have reached a point where a thorough study into the nature of attitudes toward the school, the development of these attitudes and the means of effecting attitude change appears feasible.

In summary, the problem of developing and maintaining favorable student attitudes toward the schools is an area where today's schools are seriously failing with many pupils and especially with pupils from culturally deprived environments. It is an area that is fundamental to all of the pupil's behavior in the school atmosphere, it offers a reasonable chance of success and is concerned with all three of the basic goals of full education.

J. TRANSLATING THE BROAD PROBLEM OF IMPROVING PUPIL ATTITUDES INTO A LABORATORY PROGRAM

We have identified a problem area that appears to meet our criteria. We will now deal with this area in detail to illustrate the process through which a broad problem area can be translated into a program and subsequently into specific projects and procedures. This section will develop to its conclusion a tentative program plan for the broad goal of improving the attitudes of children toward school. This plan is designed to be illustrative and is not offered as a proposal for the laboratory's operational program. It does, however, represent the present thinking of Laboratory personnel and will be developed as far as time permits. Since this illustrative topic is sufficiently narrow to permit carrying the tentative plans to their conclusion, something that we cannot now do with the project we have described earlier, it can be used to illustrate several aspects of program development not shown in Section F. For example, the research sequence illustrated is typical of major R and D programs. This sequence starts with the development of instruments, then moves to descriptive research, correlational research, experimental research, development and dissemination in that order. The objectives in the program can also be carried down to the project level and spelled out in operational terms, thus providing an illustration of a format for one type of program development.

It is hoped that this sample program can provide a basis for discussing and clarifying many of the questions that must be resolved before the Laboratory staff can develop formal detailed program proposals for the consideration of the Executive Panel. The objectives and procedural steps for the sample program are given in approximate chronological sequence.

1. OBJECTIVE I

To measure with a reliability of .50 or greater and a concurrent validity significant at or beyond the .10 level, six behavioral dimensions reflecting attitudes toward school of children at ages 4, 8, 14 and 17.

1.1 RATIONALE

The rationale underlying this objective is that many aspects of human behavior related to an attitude object contain information about the attitude of the behaving individual or group. Each such aspect of behavior is a potential measure of attitude. Observations of samples of different types of behavior can thus provide a multidirectional approach to the subject's attitude, which promises to achieve the objective of valid attitude measurement more fully than the one-dimensional approach found in most previous research. The achievement of the objective will result in six families of attitude measures – each sampling a different aspect of the subject's attitude towards school, and each based upon a different theoretical rationale.

1.2 PROJECT A

1.21 Objective 1: To determine the current state of the art in the areas of attitude measurement, attitude development, attitude change, attitudes toward education and attitudes toward school.

1.22 Tentative Procedures

1.221 To develop a complete bibliography card, note card, and reprint file of primary source publications in the areas of attitude measurement, attitude change, attitude development, attitudes toward education, and attitudes toward school for the period from 1955 to date.

1.222 To prepare a report summarizing and interpreting the current level of knowledge in the areas listed in Objective 1.

1.3 PROJECT B:

1.31 Objective 1: To develop one semantic-differential type attitude toward school measure for each age level 4, 8, 14 and 17. Measures must be significantly correlated between adjacent age strata ($r > .40$); have internal consistency coefficients greater than .60; and significantly differentiate between low-high attitude criterion groups at the .05 level of confidence.

1.32 Objective 2: To develop one Likert-type attitude toward school measure for each age level 4, 8, 14 and 17. Measures must be significantly correlated between adjacent age strata ($r > .40$); have internal consistency coefficients greater than .60; and significantly differentiate between low-high attitude criterion groups at the .05 level of confidence.

1.33 Objective 3: To develop one thematic apperception type attitude toward school measure for each age level 4, 8, 14 and 17. Measures must be significantly correlated between adjacent age strata ($r > .40$); have internal consistency coefficients greater than .60; and significantly differentiate between low-high attitude criterion groups at the .05 level of confidence.

1.34 Objective 4: To develop naturalistic behavioral situations related to attitude toward school that can be scored objectively and significantly differentiate between low-high criterion schools at the .10 level of confidence.

1.35 Objective 5: To develop a written or oral situational test instrument to measure attitude toward school for each age level 4, 8, 14 and 17. Measures must be significantly correlated between adjacent age strata ($r > .40$), have internal consistency coefficients greater than .60, and significantly differentiate between low-high attitude criterion groups at .05 level of confidence.

1.36 Objective 6: To develop an attitude toward school measure based upon selective perception and selective retention for each age level 4, 8, 14 and 17. Measures must be significantly correlated between adjacent age strata ($r > .40$), have internal consistency coefficients greater than .60, and significantly differentiate between low-high attitude criterion groups at .05 level of confidence.

1.4 TENTATIVE PROCEDURES:

It is anticipated that projects would be set up for each of the aforementioned objectives and four or five of the six would be completed on a contract basis. The following procedures sketch out the probable course that these projects would follow.

1.41 Set up specifications for each project

1.42 Identify behavioral scientists qualified to conduct each project

1.43 Negotiate contracts

1.44 Plan and start in-house project

1.45 Conduct project

- 1.451 Develop theoretical rationale for the instrument
- 1.452 Develop preliminary instrument
- 1.453 Select low-high attitude criterion groups "a" and "b"
- 1.454 Administer preliminary instrument to low-high criterion group "a"
- 1.455 Analyze and revise preliminary instrument
- 1.456 Administer revised instrument to low-high criterion group "b" to cross validate

1.457 Develop operational instrument

1.458 Administer to random sample of pupils at age levels 4, 8, 14 and 17

1.459 Prepare manual including normative data, reliability and validity data for operational instrument

2. OBJECTIVE 2

To describe in quantitative terms the patterns of attitudes toward school of random samples of classroom groups and of stratified random samples of children drawn from defined racial, ethnic and socio-economic groups within the Laboratory region at the ages of 4, 8, 14 and 17 years.

2.1 RATIONALE

This objective is designed to establish preliminary performance criteria. On a cross-sectional basis, the attitude levels of children prior to attending school and at three critical ages during the years of school attendance will be sampled. From these data tentative performance parameters may be established, the nature and magnitude of attitude changes for each racial, ethnic and socio-economic subgroup may be inferred and differences among the subgroups may be identified.

The objective is based upon the theoretical rationale that attitudes toward school begin to be shaped during the pre-school years and that different environmental variables will shape the attitudes of the various groups sampled. Sharp changes in attitude patterns of a specific group will alert the research staff to explore variables in the environment of the group that could have contributed to the change. This objective will be met for the most part using descriptive study techniques that will help us define operationally the nature of attitude toward school among various samples at the different age levels.

2.2 TENTATIVE PROCEDURES:

2.21 Normative sample: Using 3 stage stratified random sampling of classroom units,* select 30 classrooms at grade levels 2-3, 8-9, and 11-12. The total normative sample would be 90 classrooms.

2.22 Subgroup samples: Using two-stage random sampling, select at each of the three age strata of 8, 14 and 17 years, a sample culturally deprived and non-deprived sample of 30 children of each sex from each of the following racial, ethnic or socio-economic groups. At age 4, similarly select a sample of 10 children of each sex from each group.

(a) Urban negro
(b) Urban white
(c) Urban Spanish surname
(d) Rural negro
(e) Rural white
(f) Rural American Indian

The total in-school sample number involved will be 30 children x 2 cultural classifications x 3 age levels x 2 sexes x 5 racial-ethnic-socio-economic groups, or 1800 cases. The total pre-school sample will include 200 cases. This step would involve a 2-month joint effort among 3 or more project directors and the program director and would be completed primarily by contract.

2.23 Administer attitude measures to all children in both samples

2.24 Analyze the results to establish tenative performance criteria and to test the following hypotheses:

(a) Children from different groups have significantly different overall attitudes toward school and education.
(b) Children from different groups have significantly different subscore patterns on attitude measures.
(c) Attitudes toward school and education change at different

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* School district, school, and classroom unit at each of the 3 in school age strata.

rates for children in different groups from age 5 to 17, i.e., the patterns of development of attitudes toward school and education differ significantly among the groups studied between ages 5 and 17.

3. OBJECTIVE 3

To identify variables in the environment of the children sampled at ages 4, 8, 14 and 17, that are significantly related to their attitudes toward school and determine whether significant differences are present among groups in the variables identified.

3.1 RATIONALE

The key to any attitude may be found in the total environment of the person holding that attitude. Attitudes are developed through contact with the attitude object, but are also learned from family members and other persons and objects in the environment. For example, a negro child of 4 may never have seen a school, but may have developed attitudes toward school from listening to parents and older siblings, watching TV, or looking at pictures in a discarded textbook. This objective is designed to seek out some of the probable environmental stimuli related to attitudes toward school and education in the hope that some of the most critical stimuli can be experimentally manipulated in later projects and that results can eventually be directed to the task of providing an environment in which more favorable attitudes will develop. This objective seeks out probable cause-and-effect relationships and will use casual-comparative and correlational research designs.

3.2 PROJECT A

3.21 Objective 1: To describe in quantitative terms the behavioral and environmental characteristics that have been found related to school attitude in previous research or are hypothesized to be related to school attitude.

3.3 TENTATIVE PROCEDURES

3.31 Select all variables identified in the review of literature as related to attitude toward school and locate or construct tentative procedures for measuring each variable.

3.32 Using theoretical constructs from the behavioral sciences, identify variables that may be hypothesized to relate to attitude towards school and select or construct tentative procedures for measuring each variable.

3.4 PROJECT B

3.41 Objective: To determine the relationships between behavioral and environmental characteristics identified in 3.2 and attitude measures developed under Objective I for children from different racial, ethnic, and socio-economic subgroup at ages 4, 8, 14 and 17.

3.5 TENTATIVE PROCEDURES

3.51 Assemble and develop procedures designed to measure the environmental and behavioral variables identified in 3.2.

3.52 Administer to all children that have been selected in the sample described in 2.21.

3.53 Develop semi-structured interview schedules for parents and children, train interviewers, and conduct depth interviews for a sub-sample of 5 children from each group at each grade level, or 360 cases. One parent of each child in the sub-sample will be selected randomly for sex and interviewed using the parent interview schedule.

3.54 A sample of 50 parents of each sex whose children are found to have strongly negative attitudes toward school will be assessed in depth, using extensive biographical data, measures of parental acceptance, sibling data, parental attitude data, etc., to gain further insight into probable causes for negative pupil attitude. For comparative purposes, similar data will be collected from a sample of parents whose children are found to have favorable attitudes toward school. In cases where another person appears to have had a significant influence upon the child this person will also be interviewed.

3.55 Using multivariate analysis of variance and factor analysis, analyze data to test the following working hypotheses:

(a) Specific environmental and behavioral variables are related significantly to specific attitudinal variables for children in all groups.

(b) Definable factors related to children's attitudes toward school will emerge in the analysis.

4. OBJECTIVE 4

To attain a level of attitude toward school such that Experimental Group X_1 will respond favorable* to an average of Y_1 items on a battery of six attitude measures; Experimental Group X_2 will respond favorably to an average of Y_2 items and Experimental Group X_r will respond favorably to an average of Y_r items.

4.1 RATIONALE

The child's characteristics and his interaction with factors in his environment determine the attitudes toward school that he develops.

Variables found to be related to pupil attitudes represent possible causes contributing to his attitudes. Change or removal of environmental variables related to unfavorable pupil attitudes will, if there is a cause and effect relationship, result in the pupil developing more favorable attitudes toward school. There are two crucial questions

* Specific numbers may be substituted after performance criteria have been established for each group.

to be asked at this point. Will important school-related causes for pupils' unfavorable attitudes be found in Project 3.4? The possibility of controlling a significant number of variables outside of the school situation appears remote. If important school-related variables do emerge, will it be possible to manipulate them sufficiently in a field situation to bring about measurable differences in pupil attitude? The following procedures assume that the previously described projects will lead to affirmative answers to these questions. This objective will be achieved using a series of experimental field studies in which the factors identified in Project 3.4 will be manipulated as independent variables.

4.2 PROJECT A

4.21 Objective I: To select independent attitude-related variables to be manipulated in experimental projects.

4.3 TENTATIVE PROCEDURES

4.31 Select from the variables that were identified in Project 3.4 those that meet the following criteria:

(a) Are significantly correlated (.05 level) with pupil attitudes on at least two age levels for at least one subgroup.

(b) Have at least 10% common variance with at least one attitude measure.

(c) Can be manipulated sufficiently in the school setting to offer a reasonable chance of bringing about changes.

(d) Have face validity, i.e., would be perceived by the layman as an important variable worthy of the time devoted to it.

4.32 Search the literature for research evidence suggesting the most effective ways to manipulate each independent variable.

4.33 Set up tentative plans for manipulating independent variables in the schools.

4.34 Discuss tentative procedures with school personnel.

4.35 Try tentative procedures on pilot basis.

4.4 PROJECT B

4.41 Objective: To change attitudes toward school of selected racial, ethnic and socio-economic groups by changing variables in the school environment that are related to such attitudes.

4.5 TENTATIVE PROCEDURES

4.51 Assemble a team of project co-directors, each of whom will develop the procedures for manipulating one independent variable in the school situation.

4.52 Contractors will train teachers in the use of the planned procedures.

4.53 Introduce different combinations of independent variables into different schools, using a multivariate experimental design. Expose pupils to the experimental or control treatment for one academic year.

4.54 Measure attitude changes taking place in the various experimental and control programs, using instruments developed under Objective I.

4.55 Using multivariate anaylsis of co-variance, determine the main effects of each independent variable and the interaction among independent variables, age, sex and racial-ethnic-socio-economic groups.

4.56 Prepare research report.

4.57 Develop the enviromental change programs (independent variables) that were most successful in bringing about more favorable attitudes toward school.

4.58 Train selected school personnel in the execution of these programs.

4.59 Establish demonstration centers, mobile demonstration teams, motion picture practice and other techniques to disseminate the results of the research program.

Figure 1

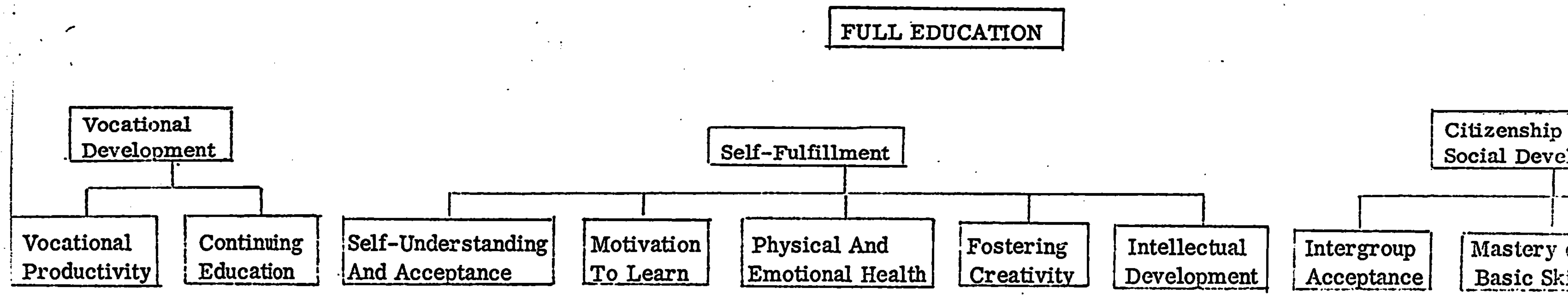
FULL EDUCATION
Vocational Development
Vocational Productivity
Continuing Education
Self-Fulfillment
Self-Understanding And Acceptance
Motivation To Learn
Physical And Emotional Health
Fostering Creativity
Intellectual Development
Intergroup Acceptance

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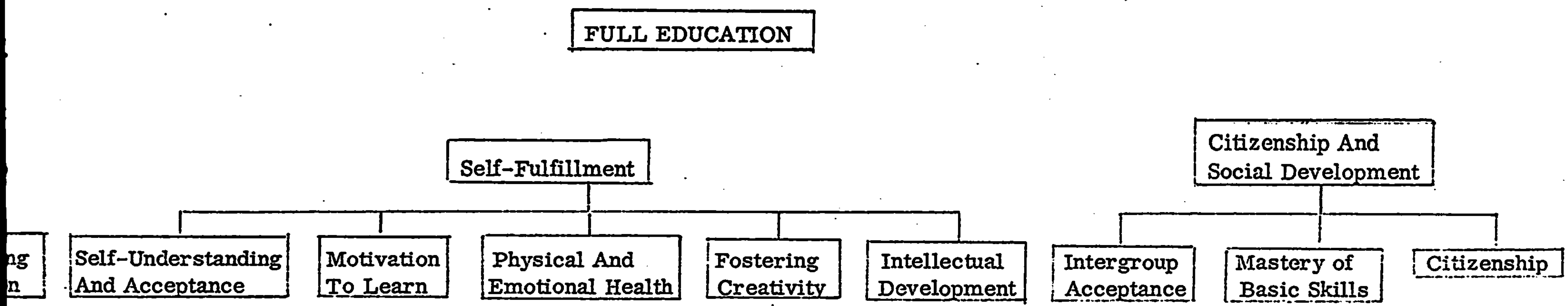
Figure 1



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FIRST POSITION PAPER

CURRICULUM DEVELOPMENT AND EVALUATION

INTRODUCTION

The Initial Plan for the operation of the Far West Laboratory for Educational Research and Development, dated June 15, 1966, presented five program areas for laboratory activity. Among them, the Curriculum Program area was presented with the fundamental question, "How can reasonable choices be made among the increasing variety of innovations in curricula?" Reference was made to the wide range of innovative texts, films and other instructional materials which had been recently developed in fields of mathematics, science, English, social studies and others. The bewildering choice facing teachers and administrators at the present time promises to increase in complexity and difficulty as additional curriculum developments for elementary and secondary schools emerge at an accelerated pace.

The importance of adequate methods for evaluating the effectiveness and adequacy of these new materials was stressed. It was generally observed that they vary widely, that many have been tested only with a limited sample of children and that some may be in use without having been evaluated at all. One challenge to the laboratory program in the area of curriculum may be seen in the following quotation from the Initial Plan: "The essence of the problem appears to be one of achieving agreement on some reasonable procedures and standards for evaluation of new curriculum materials, and then designing ways to carry them out."

Another challenge described in the Initial Plan relates to the question of balance. The pressures created for course content improvement in curricula have resulted in a situation where certain curriculum areas have been accorded higher priorities and have been supported by government and institutional funds. Initially, science and mathematics were favored. Questions, therefore, remain about other areas of curriculum development which did not have high priority and which need similar development and support. For example, fields such as social and humanistic studies need to be examined as well as fields of science and mathematics.

In addition to the general statements of objectives for the Curriculum Program area, the Initial Plan described six projects to be begun this year. It is acknowledged that these projects were developed prior to the formulation of program objectives in the five program areas. These projects, however, were considered to be appropriate to the early stages of development of the programs. In particular, the Curriculum Program was seen as an area where there had been much developmental activity along a broken front. The variability noted among schools was striking; and it was acknowledged that there is insufficient information about the status of newer curriculum developments. It was seen to be important that the Laboratory develop a "road map" of the present state of affairs with regard to curriculum developments. Without this "road map," programmatic thinking would not be possible because the existing state of affairs would not be adequately defined.

It was also noted in the Initial Plan that many of the newer curriculum developments had not given sufficient attention to the question of teacher competencies. It was seen important, therefore, to learn more about the experiences that teachers who were attempting to use innovations were having.

In light of the above, the Initial Plan proposed a project, Conferences on Curriculum Development and Evaluation. The project originally prescribed four conferences of two and a half days each for approximately 10 participants each in the fields of mathematics, science for the elementary grades, foreign language programs for elementary and junior high schools, and the linguistic approach to English language instruction. Subsequent to the writing of the Initial Plan, a fifth conference was added in the area of social sciences.

The objective of the conferences is to "... translate the needs for teacher preparation and evaluation into practical programs that can be undertaken by the Laboratory."

The reports from the five conferences should, therefore, enable the program personnel of the Laboratory to take a broader and more intensive look at these important areas of the school program. It should then be possible to utilize the conference recommendations in the formulation of objectives and program components in this very important program area.

OVERVIEW

Major components in this paper include a review of the major current curriculum revisions in several curriculum areas. While these reviews do not encompass all new developments, they do identify some of the major developments that have achieved national attention. Obviously, such a review must be brief; however, the members of the Executive Panel may wish to request that the staff give more information about one or more of these developments.

The paper presents an analysis of curriculum revisions in general in light of what is known about instructional systems. The analysis in this section includes a discussion of need theory and practice in the change process, a brief description of the systems approach to instructional problems, some consideration of criteria for determining whether or not a curriculum revision is ready or whether it needs more work, and a discussion of the possible application of criteria of readiness.

The final section presents an initial analysis of the problem of evaluating the new curricula offerings. Consideration is given in this section to the criteria for use in such evaluation, such as the interrelationship of the new development with broad instructional goals and with course objectives. Additionally, there is preliminary discussion of problems of experimental design and evaluation.

This paper represents an initial step in the process of program formulation and is submitted to the Executive Panel for discussion.

REVIEW OF SOME MAJOR CURRICULUM REVISIONS

The beginning date of the present wave of curriculum reform activities is difficult to identify. It emerged as a result of the interaction of a wide range of factors. Some of the factors were the concern of scholars and learned societies with the observed lag between the discovery of new knowledge and its appearance in the curriculum in the elementary and high schools; the dissatisfaction of membe... of the teaching profession with the available teaching materials; the difficult if not impossible try to make wise curricular choices; the new findings from research studies on the question of how changes are brought about in a complex behavior such as teaching; the application of systems analyses to curriculum development; the dilemma caused by inadequate evaluation instruments.

With the political attention given to education after the launching of Sputnik I, many curriculum development activities which had been located in research centers on university campuses, loomed to national importance. The United States Government as well as many state governments invested substantial amounts of money in these projects and encouraged the development of others. Though the movement began with mathematics and the physical sciences, it gained tremendous momentum and eventually affected nearly every major subject matter discipline. The following is a brief summary of major developments in each of several subject matter areas:

MATHEMATICS

The curriculum reform movement in mathematics is now in its second decade. The University of Illinois Committee on School Mathematics (UICSM) gave impetus to other "Modern Math" projects such as School Mathematics Study Group (SMSG), the Greater Cleveland Math (GCMP), the Syracuse University-Webster College Madison Project, the University of Illinois Arithmetic Project, University of Maryland Mathematics Project, Suppes' Experimental Project in the Teaching of Elementary-School Mathematics. In general, the math groups have revised and re-evaluated their programs. Some are now embarked upon computer-programmed materials and "systems" approaches to the teaching-learning situations. The following are selected examples of course content improvement programs in the area of mathematics.

Computer-based Mathematics Instruction (CBMI)

Objective:

To develop and test a computer-based curriculum in elementary school mathematics.

Approach:

In the development of computer-based materials, a deeper behavioral analysis of the learning process was made than was customary in previous curriculum developments.

Status:

Available materials include Sets and Numbers Books (K-4) and a First Course in Mathematical Logic planned for selected and talented students in grades five through nine, and produced some fifteen descriptive and analytical publications on the CBMI project. An experimental computer-based program, called 'Drill and Practice' (grades 3-6) originating at Stanford University is sent to several schools on teletype type equipment. Lessons are prescribed after an analysis of the pupils' work.

At Brentwood School, computer-assisted instruction is being developed in mathematics and reading for grade 1.

School Mathematics Study Group (SMSG)

Objective:

Among a number of objectives included are:

Introduce precise mathematical vocabulary; develop the structure of mathematics; introduce math concepts such as geometry and elementary algebra in the middle grades; develop courses, teaching materials and teaching methods.

Approach:

The program is based on the assumption that concepts and their relationships to the structure of mathematics is central to all mathematics teaching. Students develop an awareness of the basic properties of numbers through a discovery approach.

Status:

One hundred and forty three publications have been produced by SMSG. Among these are textbooks for grades three through ten, teacher's commentary books, supplementary materials and reports. The director of the program, Professor Begle, attended the Project F Mathematics Conference and voiced two main concerns: program articulation and teacher education.

University of Illinois Committee on School Mathematics (UICSM)

Objective:

To present math as a consistent unified discipline; to lead students to discover principles for themselves; to utilize manipulative skills necessary for problem-solving; to develop a retraining program for teachers.

Approach:

Although the discovery method is used, the students are not encouraged to verbalize discovery for fear that premature verbalization may hinder generalization.

Status:

Available is a junior and senior high school mathematics series of eleven units including teacher commentaries, examinations and self-instructional texts on solid geometry, logic and introduction to algebra. The course is being tried in many areas, the largest center being the Los Angeles City schools. There are evaluation plans.

The University of Maryland Mathematics Project (UMMAP)

Objective:

To develop precision in using the language of mathematics, to appreciate the structure of number systems, to use inductive and deductive methods of reasoning and to acquire an understanding of both metric and non-metric geometry.

Approach:

The emphasis is on fundamental learning processes in mathematics. The course attempts to develop in children an ability to recognize and use space, time and number relationships to observe, describe, classify and number, to draw inferences, speculate and experiment.

Status:

At present, an attempt is made to make the material of the second year less difficult by programming the material in shorter steps.

University of Illinois, Arithmetic Project

Objective:

To help teachers make mathematics exciting for children, to excite them with adventures in mathematics.

Approach:

Children are encouraged to guess, invent and imply mathematical principles without the restrictions of one specific problem to be solved or one correct answer to be found. As arithmetic procedures are learned, concepts from algebra are introduced.

Status:

There are nine books available for grades 1 through 6. Work is progressing on materials for children below the first grade level and beyond the sixth grade.

SCIENCE

The science movement in curriculum was started by Jerrold T. Zacharias of MIT who initiated the Physical Sciences Study Committee (PSSC). Many programs have been developed through National Science Foundation funding in the major areas such as: Biology, Chemistry, Physics, and Earth Science. Some examples follow:

Chemical Bond Approach Project (CBA)

Objective:

To present chemistry as a process of investigation with imaginative ideas used to interpret laboratory findings.

Approach:

Uses the theme of chemical bonding as a central concept to relate all of the processes and understandings of chemistry.

Status:

Project is considered complete. There are no current plans for expansion or revision. Project evaluation was published in "Science," 1962, and "The Science Teacher," 1963.

Chemical Education Material Study (CHEMS)

Objectives:

To diminish the current separation between scientists and teachers in the understanding of science; to stimulate and prepare those high school students whose purpose it is to continue the study of chemistry after high school; to give an understanding of the importance of science in current and future human activities; to encourage teachers to undertake further study of chemistry courses that are geared to keep pace with advancing scientific frontiers, and thereby improve their teaching methods.

Approach:

CHEM Study is a laboratory, discovery-oriented course.

Status:

Approximately 2,500 teachers are using the complete program. Trial editions of course materials were tested over a three-year period in a total of 550 schools with about 60,000 students. Feedback was gathered through weekly (later bi-weekly) meetings of teachers involved, and by questionnaires. A limited follow-up study at U.C. Berkeley indicated CHEM-Study-prepared students had an advantage in qualifying for the accelerated freshman course. Further follow-up studies are being undertaken to determine effect on high school science enrollments, performance in college chemistry and on understanding of the nature of science.

The study has initiated evaluative surveys and has continued to provide consultant services, on request, to those concerned with teacher preparation. Materials have been, or will be, translated into 7 foreign languages. Three text book companies have taken over the revision of CHEM Study texts and will produce three separate versions in 1968.

Elementary Science Study (ESS), Educational Services Incorporated

Objective:

The purpose of the project is primarily that of developing more meaningful materials.

Approach:

The approach is not to develop a national curriculum, but to supply a variety of carefully thought-out and tested materials which a curriculum director may use in developing an elementary science curriculum for the particular needs of his school system.

Status:

The program is not completed. Trial classes are in session with teachers making periodic reports regarding the effectiveness of materials and ESS staff members visit classes. Questionnaires are circulated and feedback information is used for evaluation and for material revision. Program directors have requested the researchers to concern themselves with the design of evaluative instruments.

The Earth Science Curriculum Project (ESCP)

Objective:

To implement a philosophy of science education that emphasizes scientific inquiry and is experience-centered for the student.

Approach:

Biology, chemistry, mathematics and physics are used to develop concepts and define processes in earth science. Most of the material is designed for use at the ninth-grade level. It is being tested in its second year with 10,000 students. Teacher feedback is supplemented by staff observation. The testing program consists of a Test of Science Knowledge (110 items) given at the beginning of the year, five Achievement Tests and one Comprehensive Final Examination.

Status:

A text, laboratory manual, and teacher's guide for use in secondary school earth science courses will be developed. One or more pamphlet series, a set of visual materials, and a set of laboratory models are also planned to supplement classroom material. Contirued activity in teacher preparation, film, and pamphlets. Commercial publication of text and lab is envisioned in 1967.

Biological Sciences Curriculum Study (BSCS)

Objective:

To contribute to the improvement of biological education through the preparation of curriculum materials related to the study of biology. To produce materials which are in harmony with methods used by scientists in the field of biology.

Process approach:

Three texts approach biology from different aspects: The Blue, biochemical; Yellow, cellular; Green, ecological. Specific facts and definitions are de-emphasized and major concepts are given most attention. Laboratory exercises are a major part of the program. Supplementary, Block, materials have been produced and a great amount of audio visual material is available.

Status:

An estimated 10,000 to 15,000 teachers are using the program and an equal number are using parts of the program. Recently Russia adopted the Yellow Version as the official biology text for all Russian schools.

AAAS Commission on Science Education
(American Association for the Advancement of Science)

Objective:

To provide interpretation and help to schools in the selection of new science materials, and encourage improvement of science education in the early grades.

Approach:

Using the text, Science: A Process Approach, students are taught science through performing experiments and learning the operational skills of science.

Status:

Two hundred and fifty teachers are using the complete program, and several hundred are using portions of it. The exercises were tried out in demonstration classes during the writing session. New equipment was designed and kits were prepared. The evaluation materials were revised and the process test was developed. New teacher training materials were prepared. Exercises are being prepared for commercial publication. Material to be published in the fall of 1967.

A writing conference to revise the exercises will be held in June and July at the University of Maryland. In addition to revising the exercises, the writers will revise the evaluation materials, the teacher education program and the teaching kits. The revised materials will be tried out by approximately 90 teachers in 1966/67. Parts one through seven have been prepared with commentary for teachers and kits for laboratory work.

Science Curriculum Improvement Study (SCIS)

Objective:

To produce a program which both guides the child's development in his experience with natural phenomena and provides him with the necessary framework in which to view such experiences.

Approach:

The teacher plays a new classroom role in which he analyzes and synthesizes the child's experience, observes him as a learner without being obligated to summarize the objectives of the lesson with him.

Status:

One unit, Material Objects, is now available commercially. Other units are being developed for elementary grade children: Instruction and Systems, Variation and Measurement, Organisms and Life Cycle.

SOCIAL SCIENCES

With few exceptions, most of the current developments in the social sciences are less visible on the national scene than those in mathematics and science. Extensive developments in the social science curriculum, equal to that in mathematics and the natural sciences, have not yet occurred. A general criticism of the present curricula in social sciences is that the rigors of the separate disciplines and the unity of social sciences have been sacrificed to amorphous studies of man and society and social living and life adjustment treatments. Many projects, some 57, are now well underway and promise to make substantial revisions in the social sciences now taught in elementary schools and high schools.

New program developments put emphasis on concepts, principles and methods of social science disciplines, are sequential, and attention is given to sociology, anthropology, political science, economics, and geography.

Much of what is underway in the Social Sciences can not be reported in the same framework as can the developments in math and science. It was felt, therefore, that the Laboratory should sponsor a fifth curriculum conference, adding Social Science to those described in Project F in the Initial Plan.

MODERN FOREIGN LANGUAGE INSTRUCTION

After many years of relatively few curriculum developments in the field of modern foreign language instruction, there emerged during the 1950's a strong national concern that the schools had failed to recognize the importance of instruction in foreign language. Fears were expressed that the American had an extreme handicap in understanding the real problems of the world with mastery of only one language.

The challenge given to the schools was to develop a nation of bi-linguals. While every American should control English, it was said that each American should also control another language. The status of language instruction at the elementary level as well as the secondary school level was elevated and installed alongside the so-called basic subjects. The National Defense Education Act provided funds and the California Legislature gave a mandate. A nation of bilinguals was seen to be an attainable goal, not an unattainable dream.

The flurry of activity among the schools to install programs of foreign language instruction was frequently characterized by inadequate planning, unsuitable materials, lack of articulation , and the absence of any evaluation. Elementary schools commenced foreign language instruction at nearly every grade level. Some used twice weekly instructional television programs, some had traveling teachers with native language competencies, some invested heavily in language laboratories. Few did more than occasionally worry about questions such as, what will happen to the students when they reach high school? What are the criteria for the selection of a particular language for instruction? Are we achieving our goals?

At the high school level, there was also great variation among the approaches. Some schools required the existing staff, whether qualified or not, to switch to materials based on the aural-oral approach. New materials were adopted without adequate evaluation as to their readiness or effectiveness. In other schools, a multi-track system was established for one or more foreign languages. In these schools it was possible for students who were enrolled in the traditional foreign language course sequence, with the emphasis on reading and writing, to continue in that sequence. Other students could be enrolled in a course sequence which stressed the conversational approach.

Few high schools, however, were prepared to receive students who had prior foreign language instruction at the elementary level. In extreme cases, these students were required to begin all over again in a new sequence in instruction. Less obvious, was the problem of the lack of articulation between the elementary and secondary foreign language instructional materials. Several of the widely used sequences of instructional materials are not designed to take a student from the elementary grades into the advanced work of the senior high school in a planned sequence.

Much more needs to be known about the curriculum materials available in the various foreign language programs before it will be possible for the Laboratory staff to make program recommendations related for foreign language instruction. Unanswered questions include those relating to the length of the sequence of instruction, the concern for a transition to or addition of other skills other than oral communication, the preparation and recruitment of a qualified teaching staff, horizontal and longitudinal articulation, and questions relating to the impact of legislated curriculum.

CURRICULUM REVISION AND "INSTRUCTIONAL SYSTEMS"

EDUCATIONAL CHANGE

It is clear from what has been given above that one of the major problems in curricula revision is concerned with the process by which curricula changes can be effectively incorporated in the school systems. Although considerable amount of research is presently being conducted in this general area,[1] the final answers to problems and strategies for efficient and effective introduction of change is not known.

It is apparent, however, from findings reported by Lewin[2] and others that for permanent change to occur in any social system including the public schools, consideration must be given to all the social and psychological factors concerned.

For this reason, it would seem that the Curriculum Program of the laboratory should be planned with consideration for the total system in which all factors effecting curricular change are taken into account.

THE TOTAL SYSTEM APPROACH TO CURRICULA

In most cases the approach to curriculum design has been on a "component" basis with little detailed regard as to how the new course would fit in

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1) The Cooperative Project in Educational Development (COPED) is an example of an inter-institutional approach to the study of models for planned changes in school systems. SEC Newsletter, I., Number 8, June 1966

2) Kurt Lewin "Group Decision and Social Change" in Society for Psychological Study of Social Issues, Reading in Social Psychology, New York: Henry Holt, 1952, p. 471

any overall system of education. When a system is largely static (with respect to goals, resource types and levels, nature of student input, etc.) modifications are absorbed by a gradual process of adjustment, some accommodation being made in the larger system, and by much smoothing and revision, in the newly introduced or changed element. However, when many aspects of an educational system are changing rapidly new problems are encountered. The adoption, introduction and maintenance of a new curriculum requires much thought if undue change costs (both material and non-material) are to be avoided and if survival and efficiency are to be achieved.

Systems Analysis and Operations Research techniques, first applied on a wide scale in military and industrial hardware situations, have created a kind of philosophy and a battery of techniques for the design or redesign of complex organizations. Briefly, operations research seeks to optimize or maximize specific values (usually of output products or input cost) by finding strategic points in the system functions where the largest (or satisfyingly large) changes can be made, usually by redesign of structural aspects of the system, by changing the "mix" of input, throughput or output elements, or by other changes such as scheduling, inventory policy, etc.

Systems analysis has most frequently been applied to initial design and early development of new systems. It usually entails all major aspects of choice and development of design concepts and their implementing hardware and software.

Beyond the usual efforts to employ logical and mathematical rigor in the development and evaluation of system models ---- and implicit in this effort ---- is the basic approach to problems as "systems" of interrelated, interacting elements. Particularly in systems analysis there is the concern that all essential elements for the construction and effective operation of a system in all of its phases be designed and scheduled to provide for a timely, effective and efficient operation.

At this time no such systems approach to design, implementation, maintenance and modification of curricula exists. Rather we are still on a components development level in which the "interface problem" (prerequisite teacher or student skills and abilities, consequences on other concurrent or subsequent learning, logistical implications, quality control monitoring, etc.) is largely ignored or is handled by designing to a specific actual or assumed model (of student quality, instructor capability, institutional resources, etc.). In some cases obvious discrepancies in curricula and their interface models have been found. (Such differences are suggested for example by the Chemical Bond Approach and the Chemical Education Material Study).

While the Laboratory will have to deal with the here and now needs of the region *vis a vis* the new curriculum "components," it seems obvious that one contribution which can be made by the Laboratory is to foster a systems approach to the design and evaluation of curricula.

READINESS CRITERIA

Prior to the consideration questions of quality and effectiveness of new curriculum innovations it is important that there be a determination of whether or not the curriculum is ready for use. The question of "readiness" is therefore one which relates to the availability of necessary parts. The basic assumption is that if a curriculum development does not have the necessary parts, certain questions regarding the evaluation cannot be faced. Readiness criteria are two broad categories. First, are the necessary materials of instruction supplied by the developer? These must include, of course, materials to assist in the introduction of the material to the school system, e.g., teacher training material. Second, has the innovation proceeded through all the steps of development which can be deemed as necessary, e.g., have field testing and revisions been accomplished? These criteria are suggested in the following outline.

1. Textbook

A student guide, work book or reading material through which students receive instruction or information should be readily available.

2. Teacher's Manual

A teacher's guide which informs the user about difficulties with the program and offers advice on implementing the program should be available.

3. Laboratory Manual

There should be directions for or planned material which provide adequate background for students to carry out laboratory work in those areas where laboratory work is a part of the curriculum.

4. Achievement Tests

There should be tests or other measurement tools by which student and teacher can evaluate their progress toward the stated behavioral objectives of the program.

5. Laboratory Kit

Equipment and materials needed to implement the laboratory part of the course should be made available at the time and place it is needed.

6. Teacher Training Material

There should be in-service training guides or auxiliary materials by which teachers can become better equipped to teach the program.

7. Revision of Material after Try-out

The program should be tried in classrooms and changed where necessary to improve the material.

8. Teachers trained to teach the program

There should be evidence that teachers who were not involved in the development of the program can be instructed in the use of the program.

9. Comparison of the Outcome with Another Course

The program's method and achievements should be compared to another course in the same subject area.

10. Independent Evaluation Made

An agency not associated with the project developers should assess the program.

11. Independent Implementation

The entire course should be successfully carried through without the involvement of the program developers.

12. Articulation and Integration

The program should fit into the curriculum so that it is articulated with scope and sequence of the curriculum.

a) Horizontal articulation should be considered as the program relates to other courses taught at the same grade level.

b) Vertical articulation should be considered as the program relates to courses which precede and follow the program in the grade level sequence (K-12).

c) Standardization of the program should be considered as it relates to other programs in the nation. The program should be suited to meet the needs of a mobile population and a population which is interdependent.

Programs which are incomplete, that is lacking in one or more criteria, and yet, found to be valuable in terms of content and method, may be completed by the laboratory and made ready for implementation. Hilda Taba suggested just such a procedure in the recent Project F Conference by stating "programs found 'half-baked' might be 'fully baked' by the Laboratory."

The following chart is a check-list for several of the newer curriculum developments in Science using the "readiness" criteria. Those developments which may be nearer a state of "readiness" will have the larger number of criteria checked. The reader is reminded, however, that the criteria are not qualitative, but only whether the parts are available.

	AV Material	Text	Teachers Manual	Lab Manual	Achievement Test	Teacher Training Material	Lab Kit	Revision	Teacher Trained	Comparison	Independent Evaluation	Implementation	Articulation	Grade Level
SCIS	x	x	x	x			x	x	x					K-3
AAAS	?	x	x	x	x	x		x	x	x				1-7 (Books)
BSCS	x	x		x	x	x		x	x	x	x	x		10
CHEMS	x	x	x	x	x	x		x	x	x		x		11
PSCS	x	x	x	x	x	x		x	x	x	x	x		12
ES (Princeton)	x	x	x	x										9
ESCP (Boulder)	x	x	x	x	x	x		x	x			x		7-8
ESS (ESI)			x	x			x	x	x			x		K-3

EVALUATION OF CURRICULUM OFFERINGS

In the previous section of a set of criteria for evaluation of the readiness for general use of curriculum package was outlined. Items 9 (comparison with another course) and 10 (independent evaluation), as well as 4 (achievement tests) and 12 (articulation and integration), bear most directly on evaluation. In this section the disucssion will be directed speci ally to the two major problems of evaluation; criteria and experimental design.

CRITERIA. Although measurable outcomes of any curriculum are essential if evaluation is to be accomplished in any specific sense, the majority of curricula must be accepted on the basis of face validity, either because no serious effort was made to specify the educational objectives in measurable terms or because the cost of obtaining adequate criterion data was seen as too great for the developer or consumer.

There are two major aspects to the curriculum criterion problem. In the first place, every curriculum must deal in some way with the course objectives. The typical problem that exists here is that once one leaves the paper and pencil course examinations (usually only probing specific knowledge and interpretation) there is little further in the way of translating the general and often vaguely stated course objectives into objectively measurable behavior or other clearly defined indicants. Vocational education enjoys a particular advantage in this respect because of its concern for training for particular skills and abilities which can be objectively assessed by performance tests. However, traditional academic education has often claimed a very broad set of goals which some consider to be sufficiently intangible as to elude measurement. Recently, programed instruction work has brought a discipline of immediate and continuous measurement of each small step or phase of the learning process. And there now appears to be a trend toward a more detailed specification of student performance whether it be in terms of the program test frames or of providing greater understanding and sensitivity to either the student or the teacher concerning status, change, and diagnosis of difficulty.

In view of the present state of the art there appear to be two aspects to the appraisal of criteria for course objectives, one serving the user of the curriculum material by providing operational data concerning student, teacher, and school accomplishment and the other providing for more rigorous and detailed information for educational researchers and curriculum decision makers. For both of these, the taxonomies of the cognitive (B. S. Bloom) and affective (Krathwohl) domains of educational objectives have laid a basis for classifying kinds of objectives. Others, such as R. F. Mager, have spelled out the requirements for describing behavioral objectives. The question is what can the Laboratory do to contribute to development of adequate course criteria?

An even more encompassing aspect of the criterion problem is the relating of any curriculum to the total goals of education. This issue is obviously relevant to the Laboratory's Program A -- Full Education. No matter how these total goals are described or classified [1] there will remain the task of showing by empirical as well as logical evidence the general and specific contribution of curricula, considered both singly and in combination. This is related to the view of curricula in a total system approach and is implicit in the problems of experimental design.

EXPERIMENTAL DESIGN. The specification of course objectives and their translation into objectively measurable behavior lay the foundation for scientific evaluation, but major problems remain in establishing just what immediate and long term effects, in particular situations, result from application of one or more curricula.

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1) The draft position paper by Walter Borg, for instance, lists 10 goals: (1) self-understanding and acceptance, (2) inter-group acceptance, (3) mastery of basic skills, (4) motivation to learn, (5) citizenship, (6) physical and emotional health, (7) fostering creativity, (8) vocational productivity, (9) intellectual development, and (10) continuing education.

First there is the problem of control and then there is the derivative problem of "carrying over" or "interaction" of one educational experience with another. These problems exist at all levels from the individual student and teacher to the larger educational system units (schools and districts).

We must face the fact that the classical experimental treatment compared with a "suitable control treatment" ---- "other things held constant" is usually an impossible experimental design and is rarely appropriate when it is possible. And yet the comparison of "new and improved curriculum A with old, conventional curriculum X" is the modal experimental plan (if the data exceeds testimonials and pre-post comparisons).

Campbell and Stanley [2] have dealt extensively with the sources of invalidity of nearly every major experimental and quasi-experimental design. Their list of sources of invalidity include: history, maturation, testing, instrumentation, regression, selection, mortality, interaction of any of these (e.g. selection and maturation), the interaction of testing and the curriculum, the interaction of selection and the curriculum,

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2) Donald T. Campbell and Julian C. Stanley "Experimental and Quasi-Experimental Designs for Research on Teaching" in N. L. Gage, Handbook of Research on Teaching, Rand-McNalley, 1963.

reactive effects of experimental arrangements which will not carry over into the operational setting (e. g. the Hawthorne effects), and multiple treatment interference.

For particular cases, designs are available which can control most or all of these sources of invalidity; however, the "real world" as contrasted to the usual laboratory situation involves multiple-valued parameters in the educational system. We are concerned about good and poor students, adequately and inadequately trained teachers, homogenous and heterogeneous pupil background, high and low socioeconomic level, urban and rural environments, large and small districts, presence and absence of training specialists, facilities, etc. (and about intermediate gradations of any of these). A moment's reflection will confirm that an impossibly large number of different parameter configurations can be generated, far too many to test exhaustively. Hence curriculum evaluation must look to research designs which will use some kind of parameter evaluation search heuristic which will "satisfy" at least the more sensitive or critical criteria.

In cases where such attempts have been made to evaluate alternative curriculum systems we have evidence that the results are far from neat ---- responses for different criteria may be contradictory, sizable differences can be found at practically every organizational level, there are many interactions, and there is almost always a time change.

Although evaluation of a single course is difficult enough there remain the "micro" and "macro" aspects; that is, on the one hand the specification of the dynamics and contribution of the subelements of a specific curriculum and on the other hand the carry-over effects (positive and negative transfer in the psychological sense, but also facilitative or inhibiting operations interactions on a social and organizational level) of one curriculum on another. And these problems are compounded by the sometimes high turnover rates among the student and professional population, and also by the periodic perturbations in larger social and political contexts of the educational system.

Clearly longitudinal studies are required which fix on all major aspects of the educational system so that the effects of curriculum change (modification or radical innovation) may be more clearly specified.

When we view current curriculum evaluation efforts against these criteria and design difficulties it is obvious that the gap between actual and needed information and technique is great. The question for the Laboratory is how may it best serve to close this gap?

FIRST POSITION PAPER

METHODS OF INSTRUCTION AND GUIDANCE

THE PROBLEM

This paper will review the status of a sampling of major research and development activities in the area of instructional methods and will identify needs related to each of these major activities that are revealed in the research literature. Instructional method has been defined in a number of ways. For example, Wallin and Travers (1963) define teaching method as "...a pattern of teacher behavior." This definition, however, seems too restrictive in view of the large amount of teaching that will probably not be done directly by teachers in the future. An instructional method is defined for the purposes of this paper as a process through which the learner's behavior is shaped in a predetermined direction. Such processes can be described in terms of at least six major dimensions:

a. Degree to which the method employs an inductive vs. a deductive approach.

b. Amount of overt pupil response required.

c. Amount of immediate feedback or knowledge of results provided to the learner.

d. Degree of adjustment for differences among learners permitted by the method.

e. Amount of vicarious vs. direct experience provided.

f. Amount of feedback about the learner that is utilized by the method.

Table 1 lists a number of teaching processes and classifies them on these six dimensions in terms of their <u>usual</u> application in today's schools or educational laboratories. Since most method labels such as "directed discovery"

Table 1

Characteristics of a Sample of Teaching Methods and Related Activities

	Content Approach			Overt Pupil Response Required				Immediate Feedback Provided Learner				Adjustment for Individual Differences			Vicarious Vs. Direct Experience		
	Content Primarily Inductive	Approach Primarily Deductive	May Be Either	High	Moderate	Low	None	High	Moderate	Low	None	Large	Moderate	Small	Mostly Vic.	Mostly Direct	Depends
1 Programmed Instruction Linear		x		x				x						x	x		
2 Programmed Instruction Branching		x		x				x					x		x		
3 Computer Assisted Instruction		x		x				x				x					x
4 Discovery	x				x					x				x	x	x	
5 Directed Discovery (Socratic)	x				x				x				x				x
6 Role Playing			x		x					x		x				x	
7 Microteaching			x		x				x			x				x	
8 Structured Laboratory Experiences		x		x					x					x		x	
9 Lecture		x					x				x				x		
10 Televised Instruction		x				x					x			x			x
11 Small Group Discussion			x		x				x				x		x		
12 Self directed Instruction or Independent study with teacher consultation		x				x					x		x		x		
13 Project Method		x				x				x			x				x
14 Recitation		x				x				x				x	x		
15 Reinforcement - Contingency Management Schedules			x		x				x				x				x

Table 1

Characteristics of a Sample of Teaching Methods and Related Activities

	Content Approach			Overt Pupil Response Required				Immediate Feedback Provided Learner				Adjustment for Individual Differences			Vicarious Vs. Direct Experience			Amount of Learner Feedback to System			
	Content Primarily Inductive	Approach Primarily Deductive	May Be Either	High	Moderate	Low	None	High	Moderate	Low	None	Large	Moderate	Small	Mostly Vic.	Mostly Direct	Depends on Content	High	Moderate	Low	None
Linear		x		x				x						x	x				x		
Branching		x		x				x					x		x				x		
uction		x		x				x				x					x	x			
	x				x					x				x	x	x				x	
ratic)	x				x				x				x				x		x		
			x		x					x		x				x		x			
			x		x				x			x				x		x			
xperiences		x		x					x					x		x				x	
		x					x				x				x					x	
		x				x					x			x			x			x	
			x		x				x				x		x				x		
on or Inde- acher		x				x					x		x		x					x	
		x				x				x			x				x			x	
		x				x				x				x	x					x	
ncy			x		x				x				x				x		x		

or "lecture" describe a family of similar processes rather than a single well defined method, the usual application as indicated in Table 1 may not reflect an uncommon but important variation of a given method. For example, most instructional procedures that have been developed from laboratory research in animal conditioning and reinforcement have employed a single reinforcer for all subjects such as pennies, small edibles, or "knowledge of results." However, the work of Homme, et. al. (1963) and Daley (1966) tailors the reinforcer to each pupil, thus better providing for individual differences than the usual approach. The major explorations and developments in the teaching methods area currently underway are concerned with directed discovery, programed instruction, and computer assisted instruction. Other instructional methods that are currently receiving somewhat less attention such as the lecture, the Montessori method, role-playing, and small group discussion will be discussed in a later paper if desired by the Executive Panel.

Some organizational approaches such as the ungraded school, team teaching, individually prescribed instruction, and ability grouping have implications for instructional methods although they are not instructional methods in themselves. For example, team teaching permits greater teacher specialization and more flexibility in the use of large group, small group, and individual instruction. It does not, however, establish or define the actual procedures that will be used by the teacher in these various educational situations. Current approaches to classroom and school organization and their implications for instructional methods will be discussed in a later paper if desired by the Executive Panel.

Certain tools have emerged in recent years that appear to offer great promise for the study of instructional methods. Among these are the microteaching approach developed at Stanford University and the various methods of measuring and classifying teacher behavior and teacher-pupil interaction such as have been developed by Flanders, Amidon, Medley, Taba, and others.* A thoughtful review of the tools available for the study of instructional methods seems important to the development of an overall picture of the state of the art in this area. This review will be provided in a later paper if desired by the Executive Panel.

CURRENT METHODS

The Directed Discovery Approach

An instructional methods approach that has gained considerable support in recent years in its various forms is the directed discovery process. This approach, derived primarily from Gestalt learning theory, provides the pupil with a minimum of basic information in a direct manner. Using this basic information as a foundation, many carefully structured and ordered questions and hints are utilized by the teacher to assist the pupil's discovery of the remaining information and functional relationships to be acquired and understood.

Research Evidence

Among the more carefully designed studies concerned with a comparison of the directed discovery method with the expository or direct-detailed method are those that have been carried out at the University of Illinois (Grote, 1960; Ray, 1957; Rowlett, 1960; and Moss, 1960). These studies have all been conducted at the secondary level (grades 8 through 12) with samples ranging from 106 to 180 pupils. Moss' study, (1960) which is fairly typical of the group, used principles

*It seems likely that a process based on microteaching will emerge over the next few years as a generally useful teaching method. It could perhaps be called the experience-feedback-experience method.

of letterpress imposition as the learning task. Pupils were divided into Treatment A (direct-detailed method), and Treatment B (directed discovery method) while Treatment C (no instruction) provided a control. Pupils were closely comparable on a number of initial test variables. The analysis compared the treatments and also compared pupils at high, average and low IQ levels in the various treatments. Moss found no significant differences in immediate recall, retention over a six-week period or transfer over a six-week period.

Both Ray (1957) and Rowlett (1960) obtained significant differences favoring the directed discovery method using a similar research design. Ray's significant results were in the area of transfer while Rowlett obtained significant results in both transfer and retention. Grote (1960) obtained significant results favoring the direct-detailed method for the immediate post-test but no other significant results.

All four of the Illinois studies appear to share the same major deficiencies. One of these deficiencies is a very short exposure to the experimental treatment. For example, in Moss' study the experimental treatments consisted of a single 47 minute instructional period. The other deficiency is the rather small number of subjects involved, which when broken down by treatment and ability level, resulted in very small subgroups and increased the probability of Type 2 errors. The strength of these studies was in the careful design of the pre and post achievement tests, the high level of comparability of the material taught, and the close comparability of the groups at the beginning of the study. Comparability of the material taught seems especially important in studies of this sort, and is rarely achieved. The order of presentation, length of time devoted to each item of information and instructional aids were the same for both treatments. All material was tape recorded to further insure consistency.

A series of three exploratory studies by Scandura (1964) throws additional light on the outcomes of the expository and discovery modes of instruction. The material to be learned involved the solution of novel abstract problems including the presentation of algorithms that could be used for solving the problems. In the expository classroom all information necessary for solving the training problems, including the algorithms, was presented directly. The information was usually presented verbally and illustrated before the subjects were given an opportunity to practice it. In the discovery classroom, learning was induced by simple directive statements, questions, and hints. The discovery subjects were not told how to solve the problem, nor were their questions answered directly.

The first two of these studies demonstrated that a certain amount of method manipulation within the usual confines of the two methods is still possible and can change results. The prerequisite information given the discovery class was made less direct in the second study, requiring somewhat more interpretation by students. An attempt was also made to reduce instructional time in the discovery class by introducing the algorithm earlier. In the expository class some effort was made to establish a more meaningful relationship between the problems and the algorithm. In both studies the classes covered the same material. Achievement testing in these studies was carried out by giving pupils a test of routine problems (R) that were directly related to the classwork and novel problems (N) that involved the same principles, but required the use of transfer. Pupils were brought up to a particular level of proficiency in solving routine problems.

In the first study the discovery class took 153 minutes to reach the desired level of facility, while the expository class took 108 minutes. On the test, the two groups were not significantly different in their performance on routine problems, but were significantly different favoring the discovery group on the novel problems. In the second study, a longer period was required to teach the material for both groups, the expository class requiring 153 minutes versus 199 minutes for the discovery class. This greater time was probably due to subjects in the second experiment being younger and more heterogeneous. The two groups again received approximately the same scores on the routine tests, but the expository class obtained a significantly higher score on the novel problems than the discovery class.

In a third study the material was simplified and the time element equated with both groups receiving 67 minutes of instructional time. The third study involved only seven pupils in the expository group and eight in the discovery group. Due to the small numbers involved, no statistical tests were applied. However, the subjects in the expository group did appreciably better on the routine test and only slightly more poorly on the novel test.

Scandura's studies suggest that the use of timing by the teacher in applying these two methods may be an important factor in their success. He concludes that,"A better understanding of the role of timing and its effects on learning, retention and transfer may be of practical import in helping make the teaching-learning process more efficient." (page 155). This series of exploratory studies seems to demonstrate clearly the potentially strong effect of within-method differences on the results of instructional methods research.

As is often the case in research on educational methodology, the literature contains some studies that appear to support the expository approach and others that appear to support the discovery approach. Haselrud and Meyers (1958) found that principles discovered by the pupil were better retained and led to more transfer than was the case when pupils were told the principles directly.

Hendrix's research in mathematics (1961) generally supports these findings. In contrast, studies made by Craig (1956), Kittle (1957), and Sassenrath (1959) found that superior learning resulted when information was given to subjects directly. Scandura (1964) has pointed out that such contradictory findings can be partially explained by inconsistent use of terms, and suggests that exposition and discovery refer to classes of methodology rather than uniquely defined methods. However, he identifies complexity of the classroom situation as perhaps the main difficulty, indicating "...failure to identify many of the basic variables and inter-relationships operating in the classroom has made it difficult, if not impossible, to study the teaching - learning process in a systematic fashion."

Development Projects

In addition to research efforts in this field, a number of projects are currently underway that are aimed at the development of curriculum materials and techniques related to the discovery method. One of the most extensive of these is the Madison Project being carried on by Davis (1965). In this project highly trained mathematicians work in classrooms and develop fully structured classroom lessons. These lessons are then disseminated to teachers by classroom observation or by viewing films which show actual classroom lessons. This project is based on the premise that the ways of using a particular method are probably as crucial to its success as the method itself. Since the development of high quality discovery lessons is considered to be beyond the ability and time available to the classroom teacher, Davis has moved in the direction of achieving quality control by devoting a great deal of time and talent to the development of polished and thoroughly tested lessons. These fully developed lessons are referred to as "stable" which indicates they can be taught by many teachers to many students with reasonable reliability.

Although Davis' work is essentially a development rather than a research project, he has been able to draw some conclusions from his four years of experience in the project. He has found that culturally privileged children whose ability places them in the top thirty percent can learn more mathematics than has usually been thought possible in grades 2 through 9. He has also found that the discovery approach has brought about much more interest in mathematics for many students than has usually been the case.

It is interesting to note that Davis also points out the problems accruing because of a basic lack of knowledge about the nature of the classroom situation. He states that "...even despite a large accumulation of studies of various sorts, the important matters of classroom social organization, 'classroom ecology,' and even more broadly, 'school ecology' have not been described well enough to provide guidance to the curriculum innovator. As a result, curriculum innovation is guided by tradition more than is desirable." (Davis, 1965, p xi).

Summary

In summary, it appears that the discovery approach, like most educational movements, is supported by strong advocates and weak evidence. A theoretical structure supporting the method has been developed by such scholars as Bruner (1961a, 1961b) and Hendrix (1960, 1961). Demonstrations of the method in such programs as the Inquiry Training Program (Suchman, 1961) and the Madison Project (Davis, 1965) have generally reported favorable results. Unfortunately, however, most supporters of a given educational process are convinced of its value and rarely set up careful research that would establish the validity of their beliefs. Thus, the favorable results often obtained may be due to any of a number of variables that have nothing to do with the method itself.

A number of theoretical questions have been raised by critics of the method. Ausubel (1964) strongly challenges the theoretical structure that

Hendrix has developed to underpin the discovery approach. He also suggests that discovery may be effective when pupils are in the concrete stage of concept development but is inefficient and time consuming for pupils who are capable of working with abstract concepts. Friedlander (1965) points out the large number of erroneous discoveries that pupils make and suggests that such discoveries are probably better remembered than the teacher's corrections.

Some limited research efforts have compared the discovery approach with expository methods. These studies have been inconclusive, probably due mainly to the small samples used and the very brief exposure of subjects to the two treatments. It seems possible, however, that conflicting results suggest that the discovery approach is more effective than exposition under some conditions and less effective under others. It seems probable that the relative success of inductive versus deductive teaching processes is a function of complex interactions among such variables as pupil ability, pupil problem solving mode, content level and content type. The literature reports no studies designed to reveal the nature or magnitude of such interactions.

PROGRAMED INSTRUCTION

Programed instruction, perhaps more than any other educational innovation, has captured the interest and attention of behavioral scientists. This interest was initially stimulated by B. F. Skinner's historic article in 1954, "The Science of Learning and the Art of Teaching." Schramm (1964) reviewed 190 reports of original research on programed instruction in the 10 years following Skinner's article and noted that the rate of publication was accelerating rapidly throughout that period. Most of the early research in this area was concerned with linear programing but in the past 3 or 4 years we find an increase in the proportion of studies in which branching has been employed. Since a much larger body of research evidence is available in programed instruction than in directed discovery, a general overview will be presented rather than a discussion of a few key studies.

Research Evidence

Enough studies have been conducted comparing programed instruction to "conventional instruction" to make it apparent that under some conditions, some pupils can learn as effectively or more effectively from programed materials. Of 36 such studies reported by Schramm (1964), 17 reported significant differences favoring programed instruction, 18 showed no significant differences, and only one favored "conventional" classroom instruction.

Much of the research in programed instruction, although interesting, fails to deal with the basic questions that seem to require better answers. For example, it would appear that comparisons between programed instruction and "conventional" classroom methods would be much more useful if the "conventional" method were more rigorously defined and controlled than has usually been the case. Perhaps an even more crippling weakness of most such studies, however, is their preoccupation with which method is "better" without exploring such questions as: Under what conditions is programed instruction an effective technique? What are the characteristics of students who learn more effectively from this approach? What type and level of content is most effectively taught? What are the interactions among such variables as the pupils' problem solving mode, the cognitive level of the learning task, and the degree of abstractness of the content? It seems that these more complex questions, which for the most part require multivariate designs and careful control, are largely unanswered at present.

Single variable experimental studies comparing sequenced and random order programs similarly seem too limited since the value of a logical structure would appear to depend on the content being taught and the length of the program. Similarily, studies on step size and error frequency criteria appear of practical value only if considered in the context of such variables as curriculum content, nature of the learning task, and student maturity.

Studies concerned with comparing constructed response, "thinking" the response, and selecting a multiple choice are important since the constructed response seems to limit the flexibility of the method, especially in computer assisted applications where this approach introduces a difficult input problem. The great majority of studies in this area show no significant differences, suggesting that the constructed response is not essential to effective programed instruction.

A major apparent advantage of programed instruction is that it permits self-pacing, thus introducing a way to individualize the presentation.

Research results, however, have not demonstrated a consistent superiority for either self-pacing or external pacing. Here again, studies that explore interactions among pupil characteristics, type of content, response mode, and pacing would give us greater insights into the nature of programed instruction. For example, students with high motivation working with difficult content may achieve more in a self-pacing situation, while students having low motivation and working with easy content may achieve more in an external pacing situation. This review, however, did not locate studies in which interactions between pacings and other variables had been explored.

COMPUTER ASSISTED INSTRUCTION

Computer assisted instruction is essentially similar to programed instruction. As normally used, computer assisted instruction is an expository technique involving a high level of student interaction plus immediate feedback or knowledge of results. Computer assisted instruction (CAI) differs from programed instruction along three main dimensions. First, it is much more versatile. Levels of branching that would not be practical with a programed textbook because of the time that would be required for the student to locate the necessary branches can be handled in a fraction of a second by the more sophisticated computers. The computer can also communicate with the student through either auditory or visual means. The other aspect which differentiates computer assisted instruction from programed instruction is the computer's capacity to measure and record information about student responses. For example, the computer system being used in the Stanford-Brentwood Project provides for recording 30 different types of information about the student response. This capacity makes it possible for the computer to identify and possibly correct some kinds of program deficiency. The computer can also store and use information about each pupil that will lead to a level of instructional individualization through branching decisions that is probably not possible by any other means. The versatility of the computer is so great that it would not be beyond the realm of current technology to build a computer assisted instructional system that could simulate, at least for some content areas, nearly any instructional process.

Development Programs

A number of development programs of limited scope have been underway for the past several years. Most of these programs have employed makeshift hardware that, although useful in getting some preliminary insights about the approach, fall far short of realizing the potentials of computer assisted instruction. The work of Braunfeld (1964) and his associates with the PLATO I and PLATO II are typical of these preliminary exploratory programs. PLATO II, for example, employed an ILLIAC Computer and could accomodate only two student consoles. The programs developed for PLATO II were essentially linear in the sense that all students completed the same main sequence, the only branching occurring when a student entered or did not enter a help sequence. In contrast, the PLATO III system has been built around a CDC 1604 Computer that will permit much more complex judgements about the student's behavior. Where the PLATO II's judgements were limited to whether the student's answer was right or wrong, the PLATO III system is designed to detect the type of error and branch to a help sequence developed to deal with this specific error. The computer will also expand or contract the main sequence as a function of how well the student is doing. Poor student performance will cause the computer to insert further problems and text at specified places in the sequence. The CDC 1604 would have sufficient capacity to work with as many as 1000 students simultaneously using the PLATO II type of teaching.

The SDC experimental computer-based instructional system developed in 1960 was similar to the PLATO I system, although somewhat more versatile. This initial system was superceded by the CLASS computer system in 1961. This system is based on a large scale computer, the Philco 2000 and can accomodate 20 students. The CLASS system can simulate a variety of instructional systems and has sufficient capacity and versatility to explore interactions among instructional methods, student and content variables. (Coulson, 1962).

The Stanford-Brentwood Computer Assisted Instruction Project is the first to be an integral part of a public school and is among the most sophisticated work in computer assisted instruction going on at the present time. This project employs the IBM 1500 Instructional System which presently includes 16 instructional stations tied to a single computer. An instructional station provides a keyboard and television viewing screen for each pupil. The pupil may receive information either through the viewing screen or through an audio system that permits each student to hear course messages selected by the computer in any desired sequence. A light pen permits the student to respond to a question by pointing to a location on a display screen. The student may also respond by typewriter. Students have a loudspeaker and can respond orally, but although the voice is recorded, the computer does not analyze the voice message and respond to it. In the current Brentwood Program, over 100 first grade pupils are participating, half receiving computer assisted instruction in reading and the other half in mathematics. The current reading program contains 250 lessons that take over the entire task of reading instruction. Pupils completing the 250 lessons would be reading at the third grade level. The current arithmetic program is primarily drill and practice with limited branching. The reading program is a tutorial system in which extensive branching is used. Each response the child makes is recorded on the data tape. Response data are being collected in 30 catagories. This information will permit considerable descriptive research on the program as well as providing feedback on the instructional program that can be used in improvement of the programed curriculum.

Research Evidence

Because of the high cost of hardware for computer assisted instruction and the limited student capacity of experimental systems, very little hard research evidence is currently available on the effectiveness of this approach. A small scale exploratory study by Braunfeld (1964) compared students receiving computerized instruction with those receiving very similar instruction through lecture technique. Students in the two treatments were closely comparable on an examination, but those in the computer program devoted approximately one-half as much time to each lesson as those in the lecture program. A savings of instructional time with no loss in post-instructional achievement has emerged consistently from a number of exploratory studies.

Grubb and Selfridge (1963) compared a small number of college students who were taught descriptive statistics using CAI with other students who were instructed with conventional lectures and a programed text. Students working with the computer completed the course material in one-tenth of the time and performed almost twice as well on the final achievement test as the other two groups. Studies by Schurdak (1965) and Goodman (1964) also reported time saving and better achievement for students receiving computer assisted instruction as opposed to conventional instruction and/or a programed textbook.

Student attitudes towards computer assisted instruction as obtained in post test questionnaires have generally revealed positive views (Grubb and Selfridge, 1963; Schurdak, 1965; Goodman, 1964; Lewis, 1965).

As more sophisticated computer based instructional systems are developed, it seems likely that these systems will be sufficiently versatile to permit programming the same instructional material in accordance with a number of different instructional methodologies. Programming variations within a given methodology will also be possible. The possibility of such carefully controlled manipulations of the instructional method plus the capacity of the computer to record in detail a large number of pupil response variables, suggests that computer assisted instruction has great potential as a tool for studying instructional methods. A theoretical groundwork for such research has already been started in the work of Groen and Atkinson (1966), Smallwood (1962), Brelsford, et. al. (1966), and Dear and Atkinson (1962) provide examples of the utility of the computer for the study of learning and instructional methods problems.

NEEDS IDENTIFIED FROM THE REVIEW OF RESEARCH AND DEVELOPMENT IN INSTRUCTIONAL METHODS

Introduction

A review of research and development activities related to methods of instruction reveals a number of important research-related needs that must be met in order to advance significantly the state of the art in this area along a broad front. A program designed to meet any of these needs could form the basis for the Laboratory effort in the area of instructional methods over the next few years. Selecting among them would require a set of criteria similar to that developed in the initial Full Education position paper. The Executive Panel can provide valuable guidance to the Laboratory staff by discussing such criteria and by suggesting some tentative priorities that could be considered in the subsequent steps of the program development. It will be noted that although the following needs are primarily focused on the instructional process, none could be adequately attacked unless related problems in curriculum, teacher education, and perhaps full education were also considered.

Needs

1. The need to define in much more specific and inclusive terms than has yet been accomplished, the total picture of what occurs during a given teaching-learning process.

2. The need to identify and describe in detail the critical characteristics that make up each of the major teaching methods or processes. Studies in which teachers follow only in a general way a particular teaching process such as the lecture method or the discovery method cannot be productive since variations within the methods themselves can bring about marked changes in results.

3. The need to determine through research evidence whether teacher effectiveness can be increased to a greater extent by giving the teacher intensive training in the general application of a method or by developing the teaching process for each lesson to a degree where the structuring itself assures a satisfactory application of the process. Perhaps one of the most fundamental questions about instructional methodology that is raised by current research and development efforts in education is "who shall determine the curriculum and instructional methods to be used in the schools of tomorrow?" Developments in programed instruction, computer assisted instruction and televised instruction have made us aware of the great deal of effort needed to produce lessons of high quality. Such lessons cannot be developed economically unless their cost is spread over a large number of students. Thus, maximum productivity can only be attained by centralizing the development of software and using the product as widely as possible.

Work with software has shown us that developing highly effective lessons requires a level of effort, usually estimated at from 100 to 300 man hours for a 60 minute period, that can rarely if ever be reached by classroom teachers working independently. Thus, it follows that the average lesson of even the best classroom teacher is far below the quality that can be achieved by a team of experts working under a liberal time allowance. Even researchers working with methods that are based on the live teacher are coming to the conclusion that all aspects of a lesson must be developed and pretested by experts if teachers are to use it effectively. A good example of this trend is found in the Madison Project (Davis, 1965) in which a goal is to build discovery lessons that can be used successfully by nearly any teacher working with nearly any group of pupils.

4. The need to identify the specific conditions under which a given method is more effective than alternative methods. The level of ability, and maturity of the learner, the type and level of content, the thinking style and previous experience of the learner are all pertinent to the problem of identifying the most effective method for a given situation. For example, Ausubel (1964) suggests that the discovery method is inappropriate for teaching subject content except when pupils are in the concrete stage of cognitive development. Friedlander (1965) points out that lessons in which children make a large number of erroneous "discoveries" may, in view of recent research on memory as a psychological process, lead to strong retention of these errors even though the teacher may correct the child's mistakes.

Since it seems very unlikely that <u>any</u> instructional method will ever be discovered that is superior for all students, all content, and all cognitive levels, it is only through a series of large scale multivariate studies that we can accumulate the knowledge that would make it possible for the educator to select the method that is most likely to succeed in teaching a given body of material to a given student.

5. The need to identify and describe those forms of the deductive and inductive approach that lead to greater student retention. Friedlander (1965) points out that there is no body of hard evidence that the insights a student "discovers" have a higher liklihood of being remembered than insights he learns about from others.

6. With regard to all of the new teaching media that are taking over functions that have traditionally been performed by the classroom teacher, perhaps the most pressing research related need is to define in specific terms the educational goals that can better be achieved by a live teacher and those that can better be achieved by some other form of educational experience. Most behavioral scientists who have considered this question, suggest that human interaction is required for the achievement of some educational goals. In other words, they feel that certain pupil needs can be met only by direct interaction with other human beings. Few, however, have defined such needs in specific terms and none have produced hard evidence to support this view.

7. A related problem brought about by the current revolution in educational technology is that innovations such as computer assisted instruction, programed instruction, and televised instruction not only require drastic alterations in the teacher's role but in some cases may leave the teacher without any important function in the instructional situation. Unless the specific aspects of the instructional program which the teacher can handle most effectively are identified soon, schools making wide use of new media run the risk of overlooking important but unspecified aspects of the child's development that the teacher provides for in a traditional school. Innovators are also

likely to face increasing levels of dissatisfaction and stubborn resistance from teachers who can no longer define their roles in the educational system. Can such innovations survive in the face of organized teacher resistance? Perhaps even more to the point, must the institution of the teacher be destroyed in order to open the way to educational revolution? (Gagne, 1966).

8. Another problem suggested by the role conflicts that can emerge from changes in the public schools is the need to study and understand more about the nature of resistance to change that is so often found within the educational establishment. Schools tend to represent a major conservative bulwark within our society and there is every reason to expect that this establishment will resist the revolutionary changes that could be brought about by new educational technologies. This problem, although not directly related to instructional methods, illustrates the danger of studying an aspect of education and ignoring other aspects.

9. A review of research and development work in computer assisted instruction reveals a pressing need to develop more efficient techniques for the production of the computer software, i.e., the programs through which curriculum materials are presented. In the Brentwood project, for example, the cost of developing curriculum materials for teaching mathematics and reading to first grade pupils was approximately one-half million dollars, or equal to the cost of the hardware and building involved in the project. Once developed, of course, such curricula materials can be used with any numbers of pupils where compatible computer systems are available. This fact notwithstanding, the

curriculum building procedures employed in the Brentwood project appear laborious and costly. Smallwood's preliminary study (1962) offers some promise that the computer can accumulate information about pupil characteristics and responses that will improve its subsequent branching decisions. It can also collect other response data that can identify weaknesses in the program. Silberman (1962) goes further and suggests ways in which computers might be programed to develop as well as improve instructional materials. This problem, of course, relates to a need frequently expressed in the literature on computer assisted instruction, namely, to bring the cost of this form of instruction down to a level reasonably competitive with current instructional methods.

10. In the area of programed instruction, a major need identified by research to date is the need to carry out studies that will manipulate all or most of the important variables that have been explored singly by past research. These include error frequency, programing method, pacing, content type, step size, response mode, prompting or confirmation procedure, item sequence, reinforcement schedule, and pupil characteristics.

Schramm (1964) concluded that: "When we understand more than we do now about how to combine different kinds of programing, how to vary the schedule of reinforcement, and how to fit a program to different learning objectives and student abilities, above all when we learn more about how to maintain the student's interest and challenge him through what is now very often a very dull exercise in conditioning, then programs are likely to look far different from the way they look today." (p 73-74).

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FIRST POSITION PAPER

EDUCATION OF TEACHERS AND OTHER PROFESSIONALS

This paper has been written for the purpose of bringing to the Executive Panel some information about both the national and regional problems related to the education of professional personnel who are responsible for the education of our youth.

The major problem was aptly stated in the Initial Plan:

> How can teachers and other school personnel obtain the new knowledge they need for the introduction of new methods and techniques into the schools? The needs for continual improvement of teacher knowledge are on the increase. The amount of newly introduced curriculum materials and techniques in the modern school is constantly growing; teachers, principals, and school administrators are generally highly aware of the need to keep abreast of these new developments.
>
> Over a number of years, considerable effort has been devoted to teacher education by means of in-service training workshops and summer institutes. It is apparent that these previous programs of education and re-education of school personnel have varied considerably in their effectiveness. There is also great variety of pattern, scope, and objective in the programs of teacher education currently being conducted within the region of the Laboratory, and even greater variation in the judged accomplishments of such programs. The problem presented by this situation is one of identifying and evaluating patterns of in-service education, applicable to teachers and other school personnel, which hold the greatest promise of imparting needed knowledge about new developments in school programs.[1]

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[1]Far West Laboratory for Educational Research and Development, Initial Plan (San Francisco: FWLERD, June 15, 1966), p. 9.

For amplification of this general problem the school personnel have been subdivided into four categories:

Pre-service Teacher Candidates
Non-tenurial or Beginning Teachers
Tenurial Teachers
Supervisors of Teachers

These four categories were selected because the educational problems are unique to each group.

Pre-service Teacher Candidates

Perhaps the most basic problem in pre-service education is in the selection and recruitment of college students who are best suited to later serve the educational needs of youth. Testimony that this is the problem is the fact that nationally the school population will increase approximately one million a year and considering that 150,000 teachers retire or leave the profession each year we need a constant 200,000 teachers per year.[1]

In California the Supply and Demand study conducted by Blair Hurd of the California State Department of Education indicates that our colleges and universities will, in the next ten years, produce only fifty-four percent of the total need.[2] (Annually needed are 13,030 elementary teachers and 8,490 high school teachers.) Presently we have severe shortages of teachers in the elementary field (5,126) and shortages in the total high school field (1,441), but over-supply in art, men's physical education, and social science.

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[1]National Education Association, Teacher Supply and Demand in Public Schools (Washington, D. C: NEA, 1966).

[2]Blair E. Hurd, California's Need for Teachers 1965-1975 (Sacramento: California State Department of Education, 1965).

In a fact finding trip in the spring of 1966 William G. Sweeney of San Jose State College found that the number of students in elementary teacher training had dropped in the following numbers:

School A - A drop from 81 to 35
School B - A drop from 300 to 178
School C - A drop from 230 to 30
School D - A drop from 63 to 9
School E - A drop from 94 to 51 [1]

It is his observation that students are not entering elementary education because it is their feeling that for five years' work one may as well get a secondary credential (teachers in the secondary school systems benefit from higher salary schedules than those in elementary school systems). Many students regard the training program for elementary work, designed essentially the same as for secondary work, as inappropriate for an elementary teacher.

He also points out that there is a shortage of fully trained teachers and an increase in provisional teachers because of the many short cuts available to circumvent the regular training programs.

Too frequently our profession is reminded of the adage, "those who can, do; those who can't, teach." Popularized too is the notion that students who are preparing for teaching positions are at the bottom of the academic heap. New evidence and perhaps a change in the trend is indicated by several sources. Ernestine Bledsoe confirms the title "Quality Students In Teacher Education at Wesleyan College" with the facts that at this women's college the percentage of students in teacher education generally excelled the percentages of students in all other departments; more teacher education students graduated cum laude and

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[1]William G. Sweeney, The Status of Elementary Teacher Education in California Since 1960 (San Jose: San Jose State College, Aug., 1966)

magna cum laude, and more were elected as class and organizational officers. Evidence from testing indicates that the students did not get watered down academic subject matter, nor were the teacher education students at the lower end of the ability scale.[1]

In a national questionnaire study of forty-eight universities and one hundred thirty-two colleges it was found that selective devices were used in most institutions at the beginning of the upper division and at the entrance into teacher education. A grade of "C" was generally adequate for upper division; only 3.3 percent reported a grade point standard of 2.5.[2]

In a telephone survey of three regional universities and five state colleges it was found that a grade point average of 2.5 is generally required in the major field of study for admission to teacher training. Two university internship programs require a grade point average of 2.75 in the major field of study; the other requires 2.3 for admission to teacher training.

While there were no hard data to prove the contention, some college people feel that the quality of persons now entering education departments is going up. Dr. Warren Kallenbach reports that at San Jose State College more education students are on the President's and Dean's honor lists than could be expected by chance. The fact that they were all women tends to support the feeling and some data that the education departments are getting more than their share of bright women, but far

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[1]Ernestine Bledsoe, "Quality Students In Teacher Education at Wesleyan College", Journal of Teacher Education (17, Spr. 66).

[2] G. W. Durflinger, "Recruitment and Selection of Prospective Elementary and Secondary Teachers", Review of Educational Research, Oct.,63.

fewer than their share of bright men. It can be speculated that, of the job possibilities available to women, teaching pays well, but for the bright male students other professional fields offer better monetary rewards.

Recent studies at San Francisco State College substantiate the fact that if top quality students are desired in the education departments there is still work to be done in attracting the ablest segment of the college population into the profession.[1]

One regional college education department shows statistics that students in elementary education have mean ability scores below the college mean. The elementary education students' mean grade point average is also below the college mean. Men's physical education and industrial arts students were among the groups scoring the lowest (95.52 to 97.34 on the ACET). High scoring groups were engineering and physical education majors (119.97 to 118.67 on the ACET).

Perhaps the single most important element that has raised the level of those entering teaching is the Master of Arts Internship programs. There is no dearth of applicants in spite of--some say because of--high standards. At Stanford University only one out of four applicants was admitted to the internship program last year. Unfortunately, the programs with the highest applicant requirements are producing only a limited number of teachers.

The data presented here is scattered and incomplete; however, most would agree that the field of education does not attract its fair

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[1]Roger W. Cummings, San Francisco State College Norms for the Henmon-Nelson Test of Mental Ability (Credential Aptitude Test), (San Francisco: San Francisco State College, July, 1966).

share of the high ability and/or high performing students.

A second major problem in the pre-service category is that of designing the teacher training program in such a fashion that newly trained teachers will be able to fit into innovative classroom organizational patterns such as team teaching; to be knowledgable about the use of new curriculum materials and methods of instruction; and to be competent in the organizational, managerial, and public relations tasks required of a teacher.

It is apparent that the limited time devoted to these activities cannot produce a completely "finished" teacher product. But questions to be raised are:

> Is the teacher training process perpetuating the status quo (self-contained classrooms, little attention to reading before the first grade, single textbook approach to subject matter)?
>
> Is the master teacher truly a master teacher, or is he someone who needs a pat on the back, or who has merely indicated an interest in having a student teacher?

One exciting new approach to teacher training called micro-teaching is being carried out at Stanford University. Micro-teaching is part of an internship program at Stanford for the training of secondary teachers. The process of micro-teaching is also being extended experimentally to the training of elementary student teachers. Grants from the U. S. Office of Education, San Jose State College, and the Stanford Research and Development Center to Dr. Warren Kallenbach have made this possible.

At Oregon State University there is a concerted effort to curtail the number of teachers who fail in first year teaching assignments because of an inability to handle classroom discipline problems. A series of potentially difficult situations is simulated on film thereby providing teachers in training with many opportunities of coping with a large variety of classroom control problems. A supervisor helps the trainee evaluate methods he used in coping with the problem presented.

Other promising teacher education practices include New Mexico State University's program to recruit able high school pupils who because of economic deprivation could not ordinarily expect to go to college. This is a work-study program for the preparation of teachers. During the work phase of the year students may begin by earning an hourly wage of $1.65 at some school related work. This experiment will tap a different segment of society; however, the question remains--will these youngsters choose to remain in teaching, and if so how effective will they be?

An emerging concept in the United States is that our pupils should be educated by a cross section of our ethnic population. Indicative of the changes in equal employment opportunity are the statistics reported to the California State Board of Education in 1964.

TEN YEAR CHANGES IN ETHNIC GROUPS
among total California residents and total
teachers employed in California*

		Year 1940	Year 1950	Year 1960
Of each thousand residents there were:	White	955	937	920
	Negro	19	43	56
	Other	26	20	24
Of each thousand teachers there were:	White	991	985	962
	Negro	2	12	25
	Other	7	3	13

*Data for this chart were taken from "Characteristics of the population," U.S. Census of Population. Prepared under the supervision of Howard G. Brunsman, Washington, D. C.; U. S. Department of Commerce, Bureau of the Census.

The statistics clearly demonstrate the trend toward balancing the ethnic composition of those in teaching with the natural ethnic composition of the population. Percentagewise the statistics are:

Column A - Percentage of the total population.
Column B - Percentage of the teachers employed.

	White		Negro		Other	
	A	B	A	B	A	B
1940	95.5%	99.1%	1.9%	0.2%	2.6%	0.7%
1950	93.7%	98.5%	4.3%	1.2%	2.0%	0.3%
1960	92.0%	96.2%	5.6%	2.5%	2.4%	1.3% [1]

The Intergroup Relations Committee, established by the California State Board of Education and headed by Frederic Gunsky, reports the current collection of data that will clearly demonstrate the proportion of minority ethnic background teachers in our schools. The final report will be available to us after the first of the year when the State Board of Education has reviewed it.

Incomplete statistics indicate that the Oriental segment of the population is represented by probably a larger percentage of Oriental teachers than exists in the population. It can be hypothesized that this is the case because teaching is a high status occupation in that cultural group. The Negroes are poorly represented as are the American Indians and those who have Spanish surnames.

[1] Commission on Equal Opportunities in Education, Toward Equal Employment Opportunity, Third Annual Report; (Sacramento: California State Department of Education, 1964), p. 4.

Non-tenurial or Beginning Teachers

As a beginning teacher accepts a position in the schools, he is faced with having the major share of responsibility for the education of the pupils in the class. He must rely on his theory and content courses and the experiences offered in practice teaching. The graduated education student unlike newly graduated lawyers is given the full responsibility for the duties he will perform. In the field of law the graduates are seen first as clerks, residents and junior partners on the way to full status. The beginning years of service must not only satisfy the clients but colleagues as well.

Perhaps the fault should be found not with the preparation of teachers but rather with the timing of such preparation. The typical criticism that the distance between theory and practice is too great might well be met in a different pattern of teacher education.

With the Master of Arts Internship Programs steps are being taken not only to close the theory-practice gap, but to provide more extensive and intensive training. Another advantage accrued from these programs is a closer alliance between the public schools and the preparing institutions.

One regional State College has contacted the Laboratory to discuss ways and means of establishing a team approach to both the training of student teachers and the continuing education of permanent teachers.

A new design for teacher education presented at the NCTEPS Conference, 1965, by Robert Bush includes such features as: (1) a common point of entry into professional education at approximately the end of the second year; (2) a seven-year-plus program which features continuous practice from the internship to externship with pre-service education merging into in-service education and with liberal education studies that continue indefinitely as part of a liberal education; (3) a design that fits all subjects.[1]

Myron Lieberman suggests differentiation in training of teachers. He says that there is a great difference in the backgrounds needed for the teaching of various subjects, such as driver education and physics. He contends that the word "teacher" merely defines the category as does the word "salesman" and that training ought to be determined by the teaching function. He says that as a result of parallel training practices we have overtrained driver education teachers and undertrained physics teachers.

While there may be some strong feelings among teachers about which job requires the most training the notion and use of differing levels of personnel involved in the education process is becoming a reality. Evidence of this is found in the teacher aide concept where lay persons are utilized to relieve teachers in districts where classes are large and where teacher shortages exist; where pupils may have more opportunity with accompanying guidance in learning to write by the hiring of college graduates to correct compositions; where there is an effort to involve members of the community in educative and economic programs such as the EOA and ESEA Title I projects; where members of the community take Student Tutors for Elementary Pupils (STEP) training, then offer their services as teacher aides; where the government attempts to util- the talents of some by establishing a National Teacher Corps.

While there is less concern among teachers with the teacher aide

[1]National Commission on Teacher Education and Professional Standards, The Real World of the Beginning Teacher, A Report of the Nineteenth National TEPS Conference (Washington, D. C: National Education Association, 1965) p. 14.

concept there is considerable concern among them about different levels within the "teaching" ranks. Some fears result in the knowledge that promotion on the basis of experience and training plus performance is difficult and at the present state of the art less than satisfactory.

Teaching unlike other professions is without stages except for tenure and non-tenure and even in those stages the duties of the two are identical. Benson comments that we can hardly speak of a career progression where, as in teaching, a brand new teacher can replace without disruption someone who has taught for forty years.[1]

Dan Lortie of the University of Chicago Education Department thinks teachers might be willing to undergo continued observation if they saw the chance for greater ultimate responsibility and station. The resistance to giving up equality of rank may stem from fears of greater administrative decision and differential payment for similar work.

The beginning teacher is a learner and should be treated as such. Some of the efforts of school districts at assisting new teachers are met with disapproval. Comments regularly heard are:

-The in-service education is dull.

-Too much time is spent on routines instead of teaching-learning problems.

-The timing of in-service education is poor.

Other sorrows from the beginning teacher include the seniority system where the new teacher gets the least desirable class, a heavy extra duty assignment, the poorest materials.

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[1]Charles Benson, The Economics of Public Education (Boston: Houghton Mifflin Co., 1961).

In a survey done by the NEA in 1965 beginning teachers gave the following critique on the appropriateness of preparation in relation to on-the-job requirements:

Preparation was:	Too Little	About Right	Too Much
Depth of knowledge in subject fields in which you specialized	27.0%	71.2%	1.8%
General education (some knowledge in many fields)	19.9	75.9	4.2
Psychology of learning and teaching . . .	25.8	66.4	7.8
Human growth and development	23.2	72.1	4.7
Teaching methods	40.6	49.1	10.3
History and philosophy of education . . .	15.1	64.2	20.7
Use of audiovisual equipment and materials	60.1	38.1	1.8

In the literature and discussed at a recent Laboratory Conference on Instructional Methods was the lack of terminology with which to codify and communicate information about teaching. With a technical rhetoric the teaching-learning act could be described more carefully, perhaps submitted to more careful scrutiny; thereby a more precise knowledge could be communicated than we now have.

Tenurial Teachers

As was suggested in the previous section, part of our problem in relation to the continuing education of teachers stems from the need for a definition or a re-definition of the role and responsibility of the teacher--or perhaps more properly put, a definition for the variety of roles and responsibilities for those teaching.

An important publication in this area, Measure of a Good Teacher by Lucien B. Kinney, originally published by California Teachers Association in 1952, describes the teacher's role in six major categories as:

1. A director of learning
2. A counselor and guidance worker
3. A mediator of the culture
4. A member of the school community
5. A liaison between school and community
6. A member of the profession

In 1955 the CTA Committee on Teacher Education adopted the statement as its official definition of professional competence.

An examination of the details of each one of the headings reveals two or three levels of idealistic and unattainable sets of characteristic performances for teachers. While there are teachers who perform well in some of the categories it is unrealistic to expect high level performance in all categories.

Concurrent with the needs for and approaches toward teacher role definitions is the changing teaching scene; greater emphasis on providing instruction based on individual pupil need, interest and ability; increased governmental support to improve specific facets of the curricula; the proliferation of newly marked materials of instruction; and increased experimentation and adoption of different organizational patterns and instructional method of instruction.

In a study done by the Center for the Advanced Study of Educational Administration it was clearly demonstrated that the successful adoption of an innovative teaching technique (programed instruction) requires considerable definition of educational objectives for pupils; the teacher's role in their attainment; the necessary moral, financial, and material support. In the case study cited the purpose of adopting programed instruction was to facilitate the individual pupil's learning process.[1] The hollowness of cliches such as "We start where the child is" was exposed as teachers adopted practices to keep pupils working at similar rates. Teachers restricted the output of pupils so that at troublesome points group instruction could be achieved; slow pupils were encouraged to work outside of class to "keep up" and fast pupils had shorter work sessions so they would not get "too far ahead."

New difficulties in teacher evaluation occurred because what a teacher did with pupils working with programed instruction was different from the conventional instructional procedures. Some principals evaluated by asking the pupils to tell them how the teacher was doing; others were concerned about the teacher's sitting at his desk versus moving around the room; other principals made judgments about the teacher's ability or his skill in storing the material and keeping the machines in order. Since the usual daily lesson plan was made obsolete with programed instruction, many principals gave up classroom observation. Some teachers, feeling that they had lost the central position of "director of learning", introduced their own innovations into the program to regain that position.

Innovation takes place not in a vacuum but rather it is superimposed on and merged with on-going practices, structure and ideologies--the interaction gives rise to unanticipated consequences.

An innovation that a good many teachers have been asked to make in our region is from teaching in self-contained classrooms to some form

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[1]Richard O. Carlson, Adoption of Educational Innovation, The Center for the Advanced Study of Educational Administration (Eugene, Oregon: University of Oregon, 1965).

of cooperative teaching.

A regional observation by teachers and others is that in-service education in advance of a new organizational structure such as team teaching receives much time and attention--but not where attention is needed. Hours and hours go to the administrative aspects of programing the pupils and solving the logistical problems; however, little time is spent on the precise objectives of the program and on the use of different teaching techniques and materials.

Illustrative of the extent to which changes were made in the schools of California with the introduction of National Defense Education Act funds is the report in The Dynamics of Educational Change.[1] In elementary science the following changes were reported: science was scheduled as a separate class; emphasis was placed on problem solving and concept formation; content was allocated by grade level, departmentalization and a variety of flexible schedules and cooperative teaching practices were instituted; and special supervisory personnel were employed. At the secondary level laboratory facilities increased tremendously; additional content produced advanced courses; PSSC physics and CHEM Study chemistry programs were adopted. Improved teacher effectiveness was credited by higher quality of teacher preparation before employment, NSF, NDEA college and university programs and improved teacher attitudes.

Discussions at the Instructional Conference centering around the new procedures such as Individual Prescription Instruction (IPI) and

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[1]California State Department of Education, The Dynamics of Educational Change (Sacramento: California State Department of Education, September, 1963), XXXII, No. 3.

Computer Assisted Instruction (CAI) clearly brought up the changing role of the teacher. One member of our panel, Dr. Medley, who is studying teacher behavior, quipped,"We had better find out quickly what teachers do, before they stop doing it."

Experience with IPI indicates that children can learn a lot more on their own than was previously thought. What does this mean for our notions about pupil-teacher ratio? . . . about the frequency and necessity of pupil-teacher interaction? What are the skills needed for the proctor of a classroom where children are successfully working with CAI? What are the skills needed for the teacher working with a pupil who experiences difficulty with CAI? All these questions point not only to redefinition but to new definitions of teaching roles and the accompanying skills.

The untenable role of the teacher as the after-the-children-have-gone-home curriculum developer seems to be abating with the trend toward foundation supported curriculum improvement projects. Even though the teacher is not now responsible for curriculum development, he must spend a great deal of time and effort to do the day to day planning, to keep informed, and to become acquainted with new instruction strategies and content organizations.

A second problem related to the continuing education of teachers is the placement of responsibility and the allocation of time to carry on a profitable program. Practice indicates there is some confusion about whose responsibility it is. School districts assume some responsibility by organizing in-service education activities, granting sabbaticals, and by setting barriers on the salary schedule; teachers assume some responsibility by attending classes and participating in professional organizations; the government assumes some responsibility by offering stipends for attending NDEA Institutes and providing money to districts for personnel to carry on in-service education.

At a recent meeting of the Laboratory it was reported by Dr. Minnis of the University of California at Davis that responsibility for the three areas of continuing education should be allocated as follows: that remediation or what wasn't learned in the training period be the responsibility of the school district; that renewal be shared by the school district and the institutions of higher learning; and that innovation at the research level be the responsibility of the colleges and universities.

Besides the responsibility of continuing education is the problem of time for such activity. Some members of the profession feel that continuing education is catch as catch can. The State provides three percent of the employee's time for in-service education; while IBM provides one month a year. It was reported that school systems solve the time problem in a variety of ways. Some call meetings after the pupils are dismissed; some send the pupils home before the usual dismissal hour; some have limited teacher substitute time; some pay stipends for Saturday or summer programs.

Evaluation of continuing education effectiveness is a problem recognized by all concerned. In the ultimate sense in-service education is successful when teachers are more effective and their pupils learn more. To date most in-service education program objectives are not sufficiently definitive to be measurable. The in-service program that has as its objective "help teachers understand the concepts developed in new math" may not yield any different teaching or learning behavior in the classroom. What writing measurable objects requires is a precise knowledge of what needs to be done.

Because the Far West Laboratory has recognized the importance of continuing education it has designed a project to study in-service education practices. The first step in the project is a conference on in-service education held under the leadership of Dr. Warren Kallenbach. A variety of in-service education practices were reported. Among them was a retreat designed to release the latent potential of teachers as people; the use of IOTA for teacher evaluation as a route to the improvement of instruction; and several stipend summer workships. The necessity of a stipend for attendance at in-service education classes has been felt since the precedent has been established in NDEA Institutes.

A unique summer institute in Nevada offers teachers an Aerospace Science Workshop in which seventy-five percent of the time is devoted to astronomy, aerospace developments, and twenty-five percent of the time to methodology. A special feature of the workshops is the on-site visitations.

At Sonoma State College members of the Dixie School District and others enjoy an opportunity to see and experiment with educational innovations. This joint venture provides teachers with opportunities to "shop" with no obligation to "buy".

The University of Nevada presented an Amplified Telephone Lecture Series to interested teachers who reside too far from campus to take advantage of the regular university courses. The experimental course was successful even though some technical difficulties did arise.

William Fisher, Assistant Superintendent of Cupertino, reported an unusual in-service education program based on teacher demand. This elementary district of over 22,000 pupils hires no consultants on a regular basis. Their plan identifies persons in the Bay Area who put on "top-drawer" workshops. As teacher groups request help it is offered on the desired topic. For only $2,100 the faculties of Cupertino are provided an average of forty-two districts' workshops--more than one per school per week. Additionally, the in-service education program includes two or three observation visits per year for each teacher.

While junior high school and senior high school in-service education programs seem limited in number compared to elementary school in-service education programs, several interesting plans were reported. San Mateo County has a committee of teachers from grades seven through twelve who are identifying, collecting, and reporting good instructional ideas for the teaching of composition.

Twelve counties in the Sacramento Valley Area, who typically work together, have had a three-year English Project for grades K - 12. The program included teacher-leader sessions on the Davis campus, local events in participating school districts, and a large extension class in Roseville (the geographic center of the area). This year the emphases will be on bringing theory to the classroom.

Fresno City Unified School District was involved in the commercial preparation of video tapes for teacher education in the mathematics area, and subsequently successfully used them in the schools.

San Ramon School District has an unusual in-service program this year--a psychiatrist is spending an afternoon a week with the teachers of the economically deprived classes.

Berkeley School District reports a five-year in-service program with Dr. Hilda Taba. In this district a core of teacher leaders is developed and video tape is used for self-evaluation. They believe that the cognitive skills developed in social science classes transfer to other subject areas.

Project EDINN in cooperation with Carmel Unified School District with the services of Dr. Abraham S. Fishler and Dr. William M. Shanna developed a Teacher Improvement Program last summer for twenty-four teachers. The program included the introduction to and application of Flander's Analysis, Bloom's Taxonomy (Cognitive Domain) as vehicles for identifying and discussing the teacher-student interaction that takes place in the classroom and the extent to which given instructional sequences accomplish the behavioral objectives established for the sequence. Video tapes and group critique were used in the evaluation procedures.

Each participant at the Conference was asked to submit a list of problems and issues in in-service education. An analysis of these reports reveal that the five most pressing concerns were: (1) teacher participation in planning and decision-making; teacher involvement and enthusiasm; (2) the need for updating knowledge about new content; (3) administrative support including the leadership role in curriculum change; (4) the need for daytime for in-service education; (5) teacher attitude toward and use of new media.

As one conference participant put it, "We can solve our in-service education problems by answering a few questions. What needs to be known? What needs to be taught? Who needs to know? Who does know? What's the best way to organize?"

Administrators

Without diminishing the importance of well informed, competent teachers, research in change indicates that innovation in educational institutions is accomplished by administrators. Henry M. Brickell says,

> New types of instructional programs are introduced by administrators. Contrary to general opinion, teachers are not change agents for instructional innovations of major scope. Implication: To disseminate new types of instructional programs it will be necessary to convince administrators of their value . . . .
>
> Instructional changes which call for significant new ways of using professional talent, drawing upon instructional resources, allocating physical facilities, scheduling instructional time or altering physical space . . . depend almost exclusively upon administrative initiative . . . .
>
> (The superintendent) . . . may not be--and frequently is not--the original source of interest in a new type of program, but unless he gives it his attention and actively promotes its use, it will not come into being.[1]

In a descriptive study reported by Richard O. Carlson some interesting data is gathered about the characteristics of an adopting individual (or group), the way the adopting individual is joined to the communication channels and sources of information and the position the adopting individual holds in the social structure; however, there is little guidance in the knowledge that there is a direct relationship between a superintendent's position in the status structure and his rate of adopting modern math.

The challenge remains--train and maintain well qualified administrators. As the interest and support for internship programs increases some interest is being shown in the development of an internship for principals. Dr. Jerry Bellon of Sacramento State College called on me

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[1]Henry M. Brickell, Organizing New York State for Educational Change (Albany, New York: State Education Department, 1961).

in our office to describe a proposal for an internship program for the training of administrators. Among other training activities will be experiences in working with local, county, and state offices.

Indicative of the administrative support needed to get an idea working is the project described to the Laboratory by Denzil A. Morrissey, Superintendent of Santa Cruz, and Dr. Margaret Steen, the Curriculum Director, who are developing a school in which teachers may try out innovative methods and materials.

Summary of Problems

In reviewing the problems of the Education of Teachers and Other Professionals one theme permeates each problem: evaluation. How can we measure the effectiveness of our teacher training programs; how do we measure the success of a beginning teacher; how do we know if our in-service education programs are changing teacher behavior and pupil learning; how do we know when administrators are effective leaders?

While the central theme of each problem is evaluation, evaluation is not possible without its counterpart--objectives. As an example let us take the question: How do we know how effective in-service education practices are?--and let us examine the counterparts. Our first examination must be with the objectives of the in-service program. Exactly what should happen in the classroom after a successful, in-service program? The teachers will do what, how often, with what materials, for what children, and with what expected resultant learning? The objectives of the in-service education program must be so stated that the results are observable and measurable.

Stating measurable objectives puts the in-service education designers on the spot because they must know: first, the desired pupil outcome; second, the method or methods that are most successful in bringing about this result; third, the proper materials for the job; and fourth, how they know when the goals are reached. Most authorities in the field of education would concur that not enough is known yet about the teaching-learning process to make as precise statements as are desirable.

In the Education of Teachers and Other Professionals the problems have been considered in four temporal categories, but work to be done by the profession will touch each member of the teaching-learning group.

First, research must be continued relevant to the teaching-learning process; second, knowledge about new course content, instructional methods, and applied learning theory must be communicated to the teachers in such a fashion that innovation is possible; third, evaluation models must be developed.

To solve the problems stated above it is apparent that some means of measuring teacher effectiveness is necessary. With the unprecedented demand for skilled teachers, the need for evaluating the results of the teacher training programs is acute; with requests for higher levels of performance for pupil and teacher and with the increasing interest in differentiated levels of teaching, the necessity for procedures and instruments to measure teacher competence is clear.

Although the need for testing teacher competence is clear, a satisfactory procedure for this purpose has not yet been found. There are literally thousands of studies on the subject, yet no method has been widely adopted.

Following is a summary of some of the approaches to studying teacher competence. In this context teacher competence will be defined as an individual's ability to produce agreed upon results.

In an effort to get at teacher competence, a variety of approaches have been used including observation techniques using categorical checklists, specimen records, and electronic recordings; objective instruments including achievement inventories, ability inventories, questionnaires, and interview schedules. Probably the most common technique is the rating form. A research report from the NEA reveals that 80.4% of the rating forms were of the check scale variety, the remaining evaluation forms were of the written comment type.[1] Other methods include self reports, existing records, a priori classification, and combinations of a variety of methods.

A well-known and extensive study by David Ryans was initiated in the 1950's to study teacher behavior in the context of classroom behavior. The eight-year project involved some 6,000 teachers in 1,700 schools. The major objectives of the study were:[2]

1. The identification and analysis of some of the patterns of classroom behavior, attitudes, viewpoints, and intellectual and emotional qualities which may characterize teachers....

2. The development of paper-and-pencil instruments suitable for the estimation of certain patterns of classroom behavior and personal qualities which may characterize teachers....

3. The comparison of characteristics of various groups of teachers.

Extensive classroom observation data were classified in three major patterns of classroom behavior. The patterns were:

TCS Pattern X: Warm understanding, friendly versus aloof, egocentric, restricted teacher classroom behavior.
TCS Pattern Y: Responsible, business-like, systematic versus evading, unplanned, slipshod teacher classroom behavior.
TCS Pattern Z: Stimulating, imaginative, versus dull, routine teacher classroom behavior.

Seven additional teacher characteristics obtained by direct inquiry include:

TCS Characteristic R: Favorable versus unfavorable opinions of pupils.
TCS Characteristic R_1: Favorable versus unfavorable opinions of democratic classroom procedures.
TCS Characteristic Q: Favorable versus unfavorable opinions of administrative and other school personnel

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[1] Evaluation of Classroom Teachers (Washington, D.C.: Research Division--National Education Association, 1964).

[2] Louise M. Berman and Mary Lou Usery, Personalized Supervision: sources & insights (Washington, D.C.: Association for Supervision and Curriculum Development, NEA, 1966), p. 13.

TCS Characteristic B: Learning standard ("traditional" or "directive") versus child-centered ("permissive" or "indirective") educational viewpoint.
TCS Characteristic T: Superior verbal understanding (comprehension) versus poor verbal understanding.
TCS Characteristic S: Emotional stability (adjustment) versus instability.
TCS Characteristic Z: Validity of response versus invalidity of response.

Some findings with regard to teacher characteristics indicate that participation in school-like activities during childhood and adolescence may be of significance with regard to the present characteristics of teachers. With regard to age in teacher characteristics, generally speaking scores of teachers fifty-five years and above showed this group to be at a disadvantage when compared with younger teachers, except from the standpoint of Pattern Y (systematic and business-like classroom behavior) and Characteristic B (learning centered traditional educational viewpoint).

In a comparison of teacher characteristics of men and women there were minimal differences at the elementary level and pronounced differences at the high school level.

With regard to men and women teachers in the elementary school, men scored significantly lower than the women on Characteristic Y. At the high school level women generally attained significantly higher scores than men on scales measuring understanding and friendly classroom behavior, responsible and business-like classroom behavior, stimulating and imaginative classroom behavior, favorable attitudes toward pupils, favorable attitudes toward democratic classroom practices, permissive educational viewpoints, and verbal understanding. Men scored significantly higher with respect to emotional stability.

In comparing teacher characteristics in relation to school size teachers at large schools scored higher than teachers in small schools on classroom behavior, stimulating, imaginative classroom behavior, favorable attitudes toward administrators, verbal understanding, and emotional stability.

Comparisons were made of teachers in relation to many factors such as: age, teaching experience, marital status, academic success, size and socioeconomic status of the community and geographic area.

The contribution of this research is mainly a description of teacher characteristics as they existed. The data are not appropriate to individual teachers nor is there implicit any explanatory evidence. This work cannot be used for judging individual teacher competence. The author is hopeful that future studies will be directly useful for teacher educational candidates and to practicing teachers and administrators.

R. L. Turner in an attempt to gain insight into teaching behavior has viewed teaching as a problem solving behavior. Utilizing this strategy Turner and Fattu developed teaching tasks to assess a teacher's skill in several performances of reading and arithmetic.

The tasks require the teacher to process considerable information about one or more pupils and to make decisions concerning goals or instrumental responses on the basis of this information. The tasks are short and are easily administered and easily scored. This process is useful primarily for studying problem solving proficiency rather than problem solving processes of teachers.

In assessing the teacher's ability as a problem solver three variables were considered: first, they may have had different opportunities to acquire learning sets. Second, some may have been improperly exposed to opportunities to learn to solve problems so that they have acquired responses useful in avoiding such problems rather than solving them. And third, some respondents may have acquired responses that interfere with their responses in problems of a certain type. That is, they may mistake the problem stimuli for similar stimuli and give inappropriate responses. Among these sources of variation, the one dealing with opportunity to acquire learning sets has been the one focused upon in this research. It was hypothesized that beginning students in education with neither professional training nor teaching experience should perform least well, those with courses in methodology and student teaching should do better and finally the experienced teacher should do best.

After determining that the arithmetic tasks did differentiate between teachers and non-teachers, attempts were made to increase the power of the test to discriminate between widely different teacher backgrounds and levels of training.

In summary, the overall results of the investigation of training and experience variables suggest the following interpretation. First, there was considerable evidence that treatment such as methods courses and student teaching during undergraduate teacher preparation have a distinct bearing on teacher task performance in arithmetic and reading. Second, the variation in performance of teaching tasks in teaching arithmetic and diagnostic reading problems in teaching reading is associated with variations in undergraduate preparation. Teachers from small and private colleges in the Midwest perform less well than teachers from large, public colleges in the Midwest. Third, there is some evidence that variation in teaching task performance is associated with variation in teaching situation. Fourth, there is considerable evidence that the very early years of teaching experience produce the greatest rise in teaching task performance. There was little evidence to suggest that performance changed greatly for the average teacher after the third year of experience.

A good deal of research in assessing teacher competence is centered in classroom interaction. Broadly defined interaction includes the use of gestures, glances, signs, and symbols; the primary focus in describing teaching is on verbal behavior although non-verbal behavior may be included.

In 1960 Ned Flanders reported a study called "Teacher Influence, Pupil Attitudes, and Achievement: Studies in Interaction Analysis." This research was to determine effects of interaction (verbal behavior of the teacher) on the learning situation. The assumption is made that verbal behavior of an individual is an adequate sample of his total behavior.

The Flanders system of analyzing classifies teacher statements first as either direct or indirect. This classification gives attention to the amount of freedom the teacher grants the pupils. This system also categorizes the pupils' response. A third category classifies the time spent in behavior other than pupil-teacher talk.[1] (See table on following page.)

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[1]Edmund J. Amidon and Ned A. Flanders, <u>The Role of the Teacher in the Classroom</u> (Minneapolis: Paul S. Amidon & Associates, Inc., 1963) p. 12.

SUMMARY OF
CATEGORIES FOR INTERACTION ANALYSIS

TEACHER TALK	INDIRECT INFLUENCE	1. *ACCEPTS FEELING: accepts and clarifies the feeling tone of the students in a nonthreatening manner. Feelings may be positive or negative. Predicting and recalling feelings are included.
		2. *PRAISES OR ENCOURAGES: praises or encourages student action or behavior. Jokes that release tension, not at the expense of another individual, nodding head or saying "uhhuh?" or "go on" are included.
		3. *ACCEPTS OR USES IDEAS OF STUDENT: clarifying, building, or developing ideas or suggestions by a student. As teacher brings more of his own ideas into play, shift to category five.
		4. *ASKS QUESTIONS: asking a question about content or procedure with the intent that a student answer.
	DIRECT INFLUENCE	5. *LECTURING: giving facts or opinions about content or procedure; expressing his own idea; asking rhetorical questions.
		6. *GIVING DIRECTIONS: directions, commands, or orders with which a student is expected to comply.
		7. *CRITICIZING OR JUSTIFYING AUTHORITY: statements intended to change student behavior from nonacceptable to acceptable pattern; bawling someone out; stating why the teacher is doing what he is doing; extreme self-reference.
STUDENT TALK		8. *STUDENT TALK-RESPONSE: talk by students in response to teacher. Teacher initiates the contract or solicits student statement.
		9. *STUDENT TALK-INITIATION: talk by students, which they initiate. If "calling on" student is only to indicate who may talk next, observer must decide whether student wanted to talk. If he did, use this category.
		10. *SILENCE OR CONFUSION: pauses, short periods of silence, and periods of confusion in which communication cannot be understood by the observer.

The results of two studies indicated that indirect teachers would act most indirectly when new content material was being introduced and when goals were being identified and they would act most directly when goals had been clarified and work was in progress. Students of the more direct teachers learned less as measured by written examinations than students of indirect teachers. Results indicated that students learned more with indirect teachers than with direct teachers. While it was predicted that students would learn more from direct teachers in mathematics and that students would learn more from an indirect teacher in social studies, results on achievement tests demonstrated that pupils learned more from indirect teachers in both content areas.

In an in-service education endeavor it was demonstrated that the verbal behavior of teachers can be mediated by using the Flanders system of analyzing verbal behavior of teachers. Other interesting results were that the methods of training used in an in-service program should be consistent with the principles of teaching being learned. In other words, how can teachers create more independence in their own classrooms under a relatively rigid pattern of in-service instructor domination? Teachers in an in-service training course develop patterns of dependence and independence in much the same fashion as do students in a classroom. In-service training programs can provide the conceptual and procedural tools necessary for teachers to experiment with their own teaching methods. Teachers who are already above average in applying skillful and flexible patterns of teacher influence are likely to be most dissatisfied with inflexible patterns of in-service training.

The unique feature of the work of Milton Meux and B. O. Smith is that they focus attention singularly on the logic of teacher-pupil interaction. After a series of sound recordings were made Meux and Smith classified interaction into episodes which are either monologues or dialogues of teacher-pupil interaction. It is possible to classify episodes in a number of ways, such as the number of verbal interactions, psychological processes, and so forth, but for this study episodes were classified in terms of their logical features.

Established were the following categories:

Defining	Describing	Designating
Stating	Reporting	Substituting
Evaluating	Opening	Classifying
Comparing and contrasting	Conditional inferring	Explaining
Directing and managing the classroom		

While there were little data at the time of writing the authors speculate that students of teachers whose behavior measures high in logical operations would show higher scores on critical thinking tests than those with teachers having low ratings in logical operations. It would be expected that students of teachers who are superior in the handling of logical operations would rate high in the ability to identify mistakes in reasoning, in defining and valuing, and in other logical processes. For another, improvement in the teacher's ability to handle logical operations would result in more student knowledge. The student would not only learn the usual facts taught in a subject but, in addition, also learn the new relationships that proper performance of logical operation brings out. His increased knowledge and improved ability to think critically are acceptable outcomes of instruction and if improvement in the ability of the teachers to handle logical operations results in such outcomes, then teaching effectiveness can be partly determined by reference to how the teacher handles such operations.[1]

Donald Medley in a study of the effectiveness of using closed circuit television with student teachers at Hunter College developed an Observation Schedule and Record (OScAR) for the purpose of measuring teacher behavior objectively. The recorder in this case is only a recorder, not an evaluator.

The three major areas of the OScAR included verbal behaviors, behaviors associated with the management of the classroom and its social-emotional climate, and behaviors associated with processes that spur children's thinking.

<u>The Eight Factor Dimensions Scored on OScAR 3 d, e, f</u>[2]

	Non-affective Climate
Teacher Role:	
Presence:	Teacher keeps good order in his class, is rated high on use of voice and of movement and gestures, uses the blackboard effectively; his verbal behavior is high in clarification and neutral rejective of pupil responses.
Teaching Style:	
Informative:	Teacher introduces lesson with statement of objectives and relates it to pupil needs and past learnings; his verbal behavior is high on information-giving statements.
Imaginative:	Teacher makes provision for individual differences; uses examples, methods, techniques that are apt, creative, and arouse high pupil interest.
Pupil Role:	
Activity:	Both the teacher and the pupil are highly active, asking and answering questions of all types.
Initiative:	Pupils are encouraged to respond in various ways; the structure of the lesson is not rigid; the teacher sometimes has difficulty in getting the attention of the class.

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[1] Bruce J. Biddle et al., Contemporary Research on Teacher Effectiveness (New York: Holt, Rinehart and Winston, 1964).

[2] Berman and Usery, op. cit., p. 12-13.

Affective Climate

Consideration: Teacher asks more affective-imaginative questions and makes more encouraging statements than average; is courteous and shows awareness of pupil needs, interests, or difficulties. Pupil interest is rated high.

Response:

Warmth: Teacher supports or praises pupils, avoids neutral acceptance and reproves gently if at all. He often reads questions from a book or the chalkboard and directs pupil activities more than the average teacher.

Disapproval: Teacher reproves pupils and criticizes their responses; his speech pattern is likely to be below average, and he often terminates a lesson abruptly.

This appears to be a good research instrument for determining what goes into teacher effectiveness, changes in teacher behavior, changes in teaching styles for different goals, and to check changes in teacher behavior with innovative content and methods.

Other approaches to the study of teacher effectiveness have been done by John Withall who developed a technique to measure social-emotional climate through a categorization of teacher statements; by Arno A. Bellack who proposed to study the teaching processes through analysis of linguistic behavior of teachers and students in the classroom in relation to pupil learning and attitude change; by Marie M. Hughes and her associates who categorized teacher behavior into seven interaction categories--controlling functions, content development, positive activity, facilitating, personal response, negative activity, imposition.

Paul B. Gump has approached teacher effectiveness via the teacher's ability to develop an environment for effective learning. It is this author's notion that pupils do not respond to direct elements such as a teacher or peers or physical and temporal elements. The pupil's response is limited, supported, and coerced by a system that integrates these elements. Gump contends that learning will be determined by the nature of the system and the pupil's ability to utilize it.

A study done by Gump and Jacob S. Kounin demonstrates the general point of how participants behave as being dependent upon activity settings in which they are placed. They studied the kinds of hostile acts by the same boys in three camp or activity settings: swimming, cookout, and dining hall. Each one of the boys demonstrated more hostile acts in the dining hall than in the cookout, with the fewer acts being performed during the swim period. Reported in conjunction with the Gump study was the work of Baker and Wright who identified five sources that relate to setting limits and provoking behavior.[1] They include:

1. Physical sources such as the hallways in school buildings;
2. Social sources such as the teacher enforcing a rule;
3. Physiological sources such as cold and heat affecting behavioral tempo;
4. Physiognomic perception such as open spaces inviting children to exuberant, romping behavior or the tendency to be sober in church and gay at a carnival;
5. Learning: Over a period of time people learn the required behavior for the setting so that a series of cues are all that are required to shape the behavior.

These two studies call attention to a new orientation to the problem of teacher effectiveness. This orientation de-emphasizes the teacher's personal qualities and social relationships and focuses instead on the teacher's ability to develop a learning environment.

Operating on the principle that the test of the pudding is in the eating, some attempts have been made to determine teacher competency in

[1]Biddle et al., op. cit., p. 187-188.

relation to pupil gains. Early attempts were made to do this by getting a mean score for children that would indicate an expected achievement based on the ability of the pupils in the class. The central difficulty in pupil gains is one of establishing sufficient experimental controls to show that certain changes in pupil behavior occur only as a result of a given teacher. The many influences that shape pupil growth, such as the home, community, clubs, media of communication, books, magazines, etc., prove exceedingly difficult to account for in a research design.

There is a wide variety of instruments and procedures used by administrators who must evaluate for either offering continued employment and/or for improving the quality of instruction. The most frequently used instrument is a check sheet of teacher qualities and abilities on which the administrator may record his estimate of perfection on a three to five point scale.

Some instruments are of the guided comment variety where headings suggest areas to be covered by the evaluator. A few districts use just written comment with no guidelines stipulated.

Cupertino School District is experimenting with an observation booklet as a guide and record of administrative classroom observation. The unique feature is the listing of observable teaching procedures based on research and good practice for each subject taught. A sample page for spelling includes such items as: always pretests, groups for instruction, uses visual perception drills, relates phonics, etc. Three columns indicate that the teacher does pretest, needs help on pretest and the date when help was given.

In the last eight years the Instrument for the Observation of

Teaching Activities (IOTA)[1] was developed by Lucien B. Kinney and others. This observation and recording guide has the advantage of delineating to the user some specific standards of competence and some unique ways of recording observations.

In seeking solutions to and measuring progress toward the working out of the problem "how can teachers and other school personnel obtain the new knowledge they need for the introduction of new methods and techniques into the schools?" a series of interrelated factors must be considered. First, there is the teacher, his attitudes and beliefs regarding his role and the purposes of education tempered by the actions of the local administration, the board of education and the parents. The teacher's performance is also interrelated with his training, the tradition of the profession, the laws, the curriculum, the materials of instruction available, and finally, the children he teaches - their abilities, interests, needs, age, etc.

In offering new knowledges and techniques to schools selection among the materials and methods could best be made in the light of educational goals stated in measurable terms. With measurable objectives not only would the selection of new curricula be possible, but school personnel would be able to determine if the newly adopted content did produce the desired effect.

If in-service education goals were stated in measurable terms, it would be more nearly possible to determine if a particular training had achieved its purpose.

In summary, three steps that will facilitate educational change are:

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[1]Lucien B. Kinney <u>et al</u>., <u>Instrument for the Observation of Teaching Activities</u> (IOTA) (1960, 1964).

(1) the development of measurable goal statements,

(2) continued research on the teaching-learning process, and

(3) the development of ways and means to measure our progress toward the stated goals.

SECOND POSITION PAPER

INSURING QUALITY EDUCATION FOR ALL STUDENTS

(FULL EDUCATION)

1. INTRODUCTION

The situation which this position paper reviews is an outgrowth of the Laboratory's early commitment to the concept of Full Education in the belief that, "... the problem of education for all is one of designing and testing a system to insure the optional individual development of all students ... " (Prospectus, October 14, 1966). Broadly stated then, "Full Education" may be perceived as a universal goal. The Laboratory, however, has delineated several specialized aspects of the problem in its attempts to analyze Full Education as a program area. One such specialized aspect pertains to the educational disadvantage of specific cultural minorities, such as the Negro-American in urban ghettos, the Mexican-American, the migrant agricultural worker, and the American-Indian (Initial Plan, June 15, 1966).

In implementing the decision-making process adopted for the Laboratory by the Board of Directors, the staff prepared an initial situational review of the Full Education program area. The results of this review were presented to the Executive Panel in a Position Paper dated October, 1966. This Position Paper suggested that any problem selected for a project or program in Full Education should meet the following criteria:

1. Be concerned with characteristics of the individual or the situation that appear to be fundamental to the realization of the goal of full education. Variables that have an effect upon all or nearly all aspects of education are considered fundamental.

2. Be concerned with all three of the basic areas of full education, i.e., vocational development, social development, and self-fulfillment.

3. Be concerned with areas where today's educational institutions appear to be seriously failing to reach the goal of full education.

4. Be concerned with individual citizens or groups whose needs appear to be least well met by today's educational institutions.

5. Be concerned with the problems that offer a reasonable chance of solution or conditions that offer a reasonable chance of improvement within the next five years, using the resources that the Laboratory is likely to have at its disposal.

6. Be concerned with problems that are not receiving adequate attention from other research activities.

The Executive Panel then proceeded to consider each of the five program areas in its deliberation during November and December, and then asked the staff to prepare alternative "Mission Statements" or program plans within these areas. In January, 1967, the Panel studied and evaluated each of the six proposed missions and selected two: the primary mission of In-Service Teacher Education which was a program focus growing out of the Teacher Education program area; and Communication which was a program focus growing out of the Communication program area. Both missions had been shown to be valid alternatives in the situational reviews, and were seen as feasible for the Laboratory to accomplish.

This Second Position Paper in the area of Full Education is submitted to the Executive Panel to bring up to date the situational review in this program area. While it builds upon the first Position Paper, it focuses on one specialized aspect of the larger problem, the education for minority groups.

In any discussion of possible future projects related to Full Education, the six criteria stated in the earlier Position Paper as well as the following fourteen criteria which were used by the staff and Panel in the evaluation of the six proposed missions may be relevant in considering the focus suggested in this paper.

1. Importance
2. Focus
3. Breadth of tasks
4. Pay-off
5. Feedback
6. Compatibility with resources
7. Organizational involvement
8. Fund. Problem Orientation
9. Duplication
10. Funding Feasibility
11. Will it lead to broad application
12. Political Feasibility
13. Balance of tasks
14. Risk

II. GENERAL PROBLEMS OF EDUCATION FOR MINORITY GROUPS

The educational problems posed by most minority groups center around cultural differences and discrimination but a closely related problem can best be thought of in social class differences with the majority of these people growing up in deprived environments. The social class differences account for the following educational problems that appear to be common to all groups:

1. The problem of a negative self image
2. Under-development of senses and perceptions
3. Inadequate development of a formal language as a basis for intellectual development
4. Lack of concept development and problem solving ability

In addition to these common problems, there are special problems which vary from minority group to minority group. The first of these is related to the extent and kind of cultural differences that exist between a given minority group and a dominant culture. For example, even among the American Indians there are considerable cultural differences from tribe to tribe which affects their relationship to the general society and their reaction to the typical public school education that is offered them.

The second special problem is the nature of the discrimination that is reflected upon different minorities; for example, the Negro obviously experiences the most direct hostile discrimination. The discrimination against the Mexican American is less obvious but persistent. The general attitude toward the American Indian is a mixture of guilt feelings over the way they have been treated but nevertheless the stereotyping leads to covert discrimination.

The third special problem centers around the social and school situation in which a member of a minority group finds himself.

So far, the greatest amount of attention and study has been devoted to the problems of the minority groups living in a ghetto of a large city. Very little attention has been paid to the problems that they have growing up in a rural, isolated area.

III. SPECIAL OPPORTUNITIES IN INDIAN EDUCATION

Recent events (to be described more fully below) afford the Far West Laboratory for Educational Research and Development a unique opportunity to involve itself in a study of the problem of education for American Indians.

Studies designed to improve Indian education should contribute in several ways to our understanding of the problems of education for minority groups. Insofar as they have common problems with other minority groups, the knowledge we gain from such studies will apply directly to other groups. Working with the Indians also offers us an opportunity to conduct research on the special effects of cultural differences on education and how much attention we have to pay to these differences in designing effective educational programs for different ethnic groups. Since most of the Indians live in remote rural areas and therefore involve the problems that are commonly associated with small schools, such as limited curriculum and high teacher turnover, these studies should complement the work that is being done in urban situations.

There is a national concern to improve the education that American Indians are receiving. Officials in both the United States Office of Education and the Office of Economic Opportunity have expressed an interest in supporting worthwhile projects related to Indian education. The Carnegie Foundation is considering a project to study the current status of education for American Indians. Initial work toward the preparation of proposals for improvement of Indian Education has received the support of the staff at the Foundation and will probably go to the Board of Directors in September for their approval. A request for programmatic support has been presented to the Ford Foundation by the National Indian Youth Council. The staff at the Ford Foundation has indicated that they are interested in funding projects to improve Indian Education, and has invited the NIYC to submit a formal request.

The program currently under discussion in Indian education will offer the four regional laboratories an opportunity to cooperate on a nationally recognized problem that deals with a specific educational need but still provides knowledge that can be applied to broader educational problems. (If the regional laboratories cannot find a way to respond to specific educational problems such as Indian education, it is very likely that a series of competing national laboratories will be found to deal with specific problems such as this one.)

Although the problems of Indian education are viewed as national problems, the proposed projects will relate specifically to this region in three ways:

1. This is a direct approach to a specific educational problem of a sizable minority group, 50,000 Indians, in our region.
2. As a pilot project, it should provide valuable data for formulating future projects or perhaps a major program under the full education mission to improve the education of other ethnic groups in the region.
3. Since the project does not only deal with Indian education but with the problem of small schools in isolated areas, it is directly related to regional needs because we do have a large number of small schools.

IV. Completed Developmental Activities

On February 8th and 9th, representatives from seven regional educational laboratories met with representatives from the U.S. Office of Education, the Bureau of Indian Affairs and other interested groups to discuss the possibility of forming some sort of consortium to concentrate on the problems of Indian education. Everyone present recognized that there was an obvious need to improve Indian education and the regional laboratories could make a major contribution. But there also were some obvious problems. The regional laboratories were operating on limited funds with well defined programs so their contributions would have to be within the framework of the existing programs of each laboratory. Another problem was how the laboratories should organize to carry out a program to improve Indian education. This discussion in turn raised a more basic question of the appropriateness of the regional laboratories assuming that they were the correct agencies to form a national consortium to conduct research and demonstration projects related to Indian education. They obviously had considerable talent and resources to contribute, but they certainly did not have all the talent and resources that could be brought to bear on the problem. The question was also raised about the role that the leaders of the Indians would play in formulating policies. These questions remained unanswered. The result was to appoint a committee of representatives from the regional laboratories to study the problems that had been raised.

This committee met in Denver on March 5th. Six regional laboratories were represented. The discussion centered on the same kinds of questions that had been raised at the first meeting: How do we organize? Are the regional laboratories the right group to take on this responsibility? How will the Indians be represented? What programs should we undertake? Despite the lack of answers to those questions, the laboratory representatives still expressed a strong interest and each thought that the laboratories could make a substantial contribution to a program to improve Indian education if it was related to the primary programs of the laboratories. The representatives agreed to continue the committee and to continue to study the problem. Furthermore, they agreed that individual laboratories or a combination of laboratories should not postpone any program or project dealing with Indian education that was currently being considered while the committee studied how to proceed, but it was obvious that any project would have to be carried out under the authority of the laboratories involved because the committee was not in the position to endorse any program.

Four of the regional laboratories that were represented clearly had an interest and a desire to work in areas that could move ahead a program to improve Indian education. The Northwest Regional Educational Laboratory, the Rocky Mountain Educational Laboratory, the Southwest Cooperative Regional Laboratory, and the Far West Laboratory for Educational Research and Development tentatively agreed on a cooperative program which was presented to representatives of the National Indian Youth Council and the National Indian Education Advisory Council. Both organizations have endorsed the program. But both organizations were concerned with the same questions that the representatives of the regional laboratories had raised. Both groups believe that the Indians who are involved should be in a decision-making position rather than an advisory capacity. The four regional laboratories agree, so at their March 30th and 31st meeting, the NIEAC recommended that: (1) the four regional laboratories proceed with the programs as it is outlined later in this report, and (2) the National Congress of American Indians take the leadership to form a tax-exempt association for research and development in Indian education. The members of NIEAC stressed, however, that the present program should not be delayed while this group is being formed, so as an interim arrangement, the NIYC has taken the leadership in cooperation with the regional laboratories with Glen Nimnicht acting as the director.

The program that was presented to the NIYC and NIEAC was to develop eight model demonstration schools serving Indian children of different tribes. The program would be initiated during September, 1967, by opening Head Start classrooms at the eight centers where the model schools will be developed. Initially the Head Start classrooms will be modeled on the New Nursery School at Greeley, Colorado, but they will be changed as the year progresses to fit the needs of the local children and as other experimental programs are tested at various schools. During the next six years the appropriate curriculum and teaching methods will be developed to serve the educational needs of the various Indian groups that are involved.

Several contacts have been made with possible sources of support for the research projects that are being proposed. Charles Kettering, III, has already made an initial grant of $5,000 to the NIYC for the developmental work that is involved in launching such a program.

The NIYC has submitted proposals to the Carnegie Foundation and to the Ford Foundation that were referred to earlier. Jack Forbes is preparing a proposal which may be submitted to the U.S. Office of Education for funding, and the Northwest Laboratory is preparing a proposal to be submitted to the Office of Economic Opportunity. Preliminary discussions have been held with the appropriate governmental officials on both of these proposals and the Office of Economic Opportunity has already approved the use of training funds at the New Nursery School in Greeley for the training of the teachers in the first phase of the project.

Board members of the NIYC have identified six of the eight sites for the proposed programs in Indian education, and some member of NIYC has accompanied Glen Nimnicht on each of his visits to an Indian reservation. Five Indian tribes have been contacted and have agreed to cooperate in the program. They are the Indians on Fort Berthold Reservation (N.D.), Pine Ridge Reservation (S.D.), Crow Reservation (Mont.), Mescelaro Reservation (N.M.), and Walker River Reservation (Nev.). The first three reservations will be sending teachers for training on June 19th and start the project in September. The last two will send teachers for training in September and start the project in January. The Northwest Laboratory in cooperation with the NIYC is selecting a site in Alaska and working with an Indian group in Seattle, Washington. The eight demonstration schools will probably be at Rough Rock, Arizona.

V. Initial Projects Suggested for The Far West Laboratory for Educational Research and Development

The involvement of the Far West Laboratory began when the U.S. Office of Education asked the Laboratory to send representatives to a conference on Indian education. Even though the Laboratory did not have a major program related to Indian education, it was the judgment of the individuals who attended the conference that this laboratory was in the best position to provide the leadership for a cooperative effort. The initial projects suggested for the Far West Laboratory are:

1. A survey study of Indian education. The survey would consist of an in-depth study of all aspects of Indian education and related problems at the eight demonstration centers and a carefully planned sampling with questionnaires and interviews to test the general application of the data collected at the eight centers. This basic study will be covered in the proposal to the Carnegie Foundation.

2. The establishment of the eight experimental Head Start projects. The cost of the establishment of the experimental nursery school programs is already covered by local requests for Head Start Centers. The development of instructional material for the first six grades is based upon the Indian tribes' history, folklore, literature and music. The purpose of the use of this material is to develop a better self-image of the Indian child and improve the image of the Indian in the eyes of his anglo neighbors. The cost of this project will be covered in the proposal to the U.S. Office of Education.

VI. Relation of These Projects to Primary and Secondary Programs of the Laboratory

There is an inherent danger in relating new projects to the existing primary and secondary programs of the Laboratory in that the definition of these programs will be broadened to the point that they loose meaning. But as the preliminary planning on the development of model-demonstration schools progresses, it becomes obvious that a major concern will have to be the inservice training of teachers because of the high turnover rate in small schools, the low level of the quality of current teaching and the unique problem that a new teacher will face teaching Indian children.

VII. Relationship of These Projects to the Development of a Program in Full Education

These projects are not viewed as beginning a program in full education area. They are pilot projects to develop the necessary data to determine the desirability of initiating such a program and provide for it systematic development. A pertinent consideration is the ability to fund these projects outside of the basic contract of the Laboratory with the U. S. Office of Education.

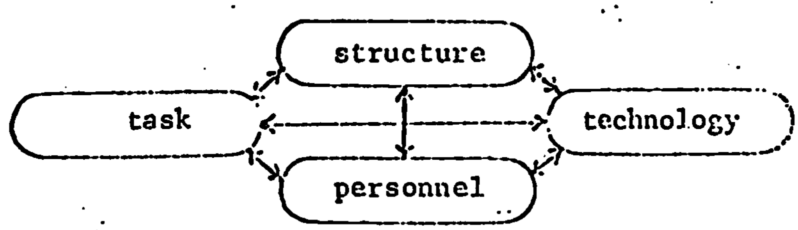
A MISSION AND A PROGRAM FOR THE FAR WEST LABORATORY

BACKGROUND FOR A MISSION

The Far West Laboratory was designed to foster educational improvement through research and development efforts and their application in the schools. The major question is how a severely limited set of resources may be organized and applied to achieve the greatest improvement in a reasonable time.

CHANGE STRATEGY

There are three types of approaches which have been used by practitioners who attempt to change an operational system: structural change ("Let's try team teaching"), technological change ("Let's computerize") and personnel change ("Let's set up an in-service training program"). Now in practice, any effort at change, whether it be in task, structure, technology or personnel



ultimately involves some change in all elements because they are interdependent. For instance, those focusing on structure must take stands on the kinds of human interaction that support their proposed structure and the kinds that threaten to undermine it. Those focusing on people must cope with the effects of technological innovation. Hence, we accept and underline the fact that: ANY PRACTICAL APPROACH TO EDUCATIONAL CHANGE MUST CONSIDER AND DEAL WITH ALL MAJOR ELEMENTS INCLUDING TASK AND CONTENT, STRUCTURE, TECHNOLOGY AND PERSONNEL.

However, it is difficult to design and manage a completely balanced approach which gives even attention to all elements, and there is reason to believe that such a balanced approach may not be a wise choice. But we should recognize that emphasis or focus on approach will influence (a) the points of entry into the organization, (b) the relative importance placed on different components of the organization, and (c) the underlying values and goals.

Point of entry relates to implicit assumptions in each approach regarding the causal chain. Some structural approaches aim at changing tasks indirectly by considering personnel as mediating agents -- that is, one changes structure to change people to improve task performance. (Chapple and Sayles, 1961) Personnel approaches usually seek to change people to change structure and tools to change tasks performance and to make life more fulfilling for people. (Argyris, 1957; Likert, 1961)

With respect to relative importance placed on components and underlying values and goals, the technological and structural approaches focus chiefly on problem-solving mechanisms while placing less emphasis on the internal operation of the organization and the processes by which new problem-solving means are generated and adopted into the organization. Personnel approaches tend to develop a micro-focus on the process of change itself -- that is, on the effect new technique, content, tasks, and structure have on people and how people in turn effect the eventual form, style, effectiveness and efficiency of the introduced content or mechanisms.

Structural Approaches. Harold Leavitt (from whom I am borrowing most of this analysis) points out that structural change has been the major mechanism of "classical" organization theorists. These approaches tend to be deductive and rational, carrying analysis from tasks backwards to divisions of labor and systems of control and authority. People are mediators. One improves performance by clarifying and defining jobs, setting up defined relationships among jobs, and by describing authority, responsibility and coordination mechanisms in detail. In practice, one is concerned with such things as span of control and logically defining necessary functions. Early efforts were often abstract, formal, legalistic and poorly related to data. More recent versions of the structural approach are found in human or social "engineering." The objective is to modify behavior of personnel in order to improve task performance, but this is accomplished mainly by modifying structure by such methods as planning work flows and grouping of specialties. Sophisticated interest is found in such items as communication nets and systems analysis.

Technological Approaches. The history of technological approaches runs from Taylorism and Scientific Management through to operations research and human engineering. Proponents for such approaches see organizations changing not in direct response to new ideas, but in response to the availability of technology that implements the ideas. For example, Scientific Management developed with the creation of techniques of work measurement, time study methods, work standards, etc. Personnel management became operational with the development of testing, attitude surveys and job evaluation. Operations research depends on the computer, linear programming, PERT, information processing techniques, simulation, and heuristic problem-solving. Generally, these approaches are "external"; they separate planning of problem-solving programs from routine operations. Their faith is in the eventual victory of the better (cheaper, more elegant) solutions over worse ones. They are most vulnerable in their typical failure to consider that human acceptance of ideas may be the real basis of change and that emotional resistance of people the real impediment. (Here we can appeal to experimental evidence: Coch and French, 1948; and to case evidence Lawrence, 1958; Mann & Hoffman, 1960; W. F. Whyte, 1955.) The logically superior solution is not necessarily the one adopted; more often it is the humanly acceptable or more feasible one. The new educational technologists can cause change in school organization if they learn this fact. If they fail to appreciate this point, either their techniques may not be adopted or if adopted may cause unnecessary resistance and hardship on the part of the human actors in the system.

Personnel Approaches. The personnel approach to organizational change argues that one can cause the creative invention of new tools and techniques or cause the modification in structure (power and control) by changing behavior. The earlier personnel approaches dealt with manipulation, attitude change, and persuasion. Some focused on techniques for overcoming resistance to change (e.g., Lewin on changing food habits and Coch and French on industrial work methods) by dealing with affect and member involvement. During the 1940's and 1950's there developed an interest in group process and dynamics (client-centered group therapy, group dynamics, and T-group). Most recently, the power-equalization personnel approaches have tried to reconcile personal fulfillment to organizational problem-solving and productivity. Initially, the premise was that if work can be set up so that it will satisfy individual needs, the work will be performed with satisfaction and efficiency. But real world problems are complex, and these approaches have in practice sought compromises and redefinition of the problem. What is clear is the experience that there is need for collaboration between changer and changee (Lippett, 1958: Bennis, 1961).

When we consider implementation which considers personnel, we note that the early approaches used attitude surveys, information and counseling programs as a way of deflecting or reducing tension and disturbance without actually changing the power structure. Later efforts focused on "union-management" cooperation. However, training from the start has been the primary device because of the need to change beliefs and skills. At first, the focus was on supervisory and foreman training in human relations; currently, the T-group is the favored device.

These approaches appear to be weak because they are so overgeneralized that they have come to deal directly with only interpersonal relations, and often fail to come to terms with particular problems where people, technique, and structure interact. Choices rarely can be based on human factors alone. All too often the efforts to expose a few selected individuals to T-group or human relations training and then return them to a work environment have failed because the environment is not supportive of the changes started in training.

A PERSONNEL EMPHASIS IN A TOTAL SYSTEM

If the above account is reasonably valid, it seems that an approach to educational change must attend to all major elements in the educational system -- that is, to tasks and their content, organizational structure, technology and personnel.

Assumptions. Here we make some assumptions which must be stated because they condition our choice of Laboratory R & D strategy. First, we assume that educational innovations will be generated in all classes of elements -- that is, we assume that we shall not lack for sufficient number and variety of innovative content, method and technology. If this were not so, we would need to deal with "invention" as well as "dissemination" of change.

Second, we believe that principles and procedures which would guide practical implementation of educational change can be found and validated. It seems unlikely that a singular grand strategy of change will be found. Human nature and society are too complex. But understanding and systematization can be achieved.

Third, we assert that education is essentially a "personnel ascendant" system. In other words, people rather than machines and materials are the major and critical element. This leads to the assumption that people must be considered and dealt with in planning and designing or in implementing changes in educational systems.

Furthermore, people must be considered in the planning and development stages so that materials and practices will "fit" or can be adopted to field situations. One of the best examples of this kind of planning can be found in the systems development efforts of the military and space firms.

Qualitative Personnel Requirements Information. In the 1950's the Air Force began to procure and implement very large and complex systems (the air defense and warning systems, balistic missile complexes, command and intelligence communication nets). The early versions ran into major difficulties because the systems were not designed with due consideration for the abilities, limitation, habits and interrelations of the people who were required to operate and service them. In some cases, operational readiness was delayed months or even years because sufficient numbers of people could not be located or trained;

in some cases, jobs were too difficult, boring or otherwise impossible. Equipment had to be redesigned and modified; training courses had to be improvised; new and unanticipated positions had to be created. Out of this experience came a set of concepts called QPRI (Qualitative Personnel Requirements Information). Each major systems contract had a QPRI section which required the contractor to specify the number and describe in detail each operator, maintenance, support, or related position required in the entire system complex. Specific plans for training and equiping each position were required, including estimates of time required, phases of training, who would do the training, where, with what materials, and at what expense. Additional requirements dealt with handbooks, manuals, blue prints, texts, job aids and tools, special protective clothing, assurance that work space, work cycles, health, recreation and other personnel factors had been considered. In effect, QPRI came to be the vehicle that created today's Human Factors teams at every major military and space R & D firm. It brought the anthropologist, psychologist, physiologist, sociologist , and educator into the design and engineering phases of what had been previously an exclusively hardware oriented effort.

Now, obviously, education runs no such risk of forgetting people in its R & D. However, the QPRI techniques may suggest some ideas which might introduce systematic method into the design of strategies for achieving educational change. Specifically, QPRI suggests that greater attention be given to defining the roles and functions of all relevant positions in any system undergoing change in order to determine how jobs would be changed and in order to pinpoint the attitudes, values, and skills that may impede or facilitate dissemination, diffusion, adoption, maintenance, and efficient use of innovations. QPRI techniques suggest the need to define the phases of implementation with focus on where, when, and how to inform, convince, train, and support. They also suggest the need to include and precisely define and schedule information programs, pilot and demonstration programs, orientation and training programs, evaluation and assessment services, and consulting and customer engineering services.

Now a parenthetical note is that the Air Force Personnel and Training Research Center, which developed QPRI, did not in fact do all the QPRI work. What they did do is develop the QPRI methods and tools and demonstrate their necessity. As the consumer and manufacturer began to recognize their value, personnel requirement definition became a common practice. The firms that were competing discovered that attention to QPRI led to greater acceptance, faster implementation, and more efficient utilization -- with a consequent reputation for producing systems that people could live with. It seems that the regional laboratory could serve a similar catalytic function by determining what must be done and how to systematize the personnel aspects of educational change. Please don't think that this job is one solely of "process." The Laboratory would have to be intimately acquainted with all aspects of the problem -- with curriculum, instructional methods, educational organization, educational materials, teacher training, educational R & D, the community needs, politics, economics, social organization, and so on. The point of focus though would be on how these aspects must be considered and related to achieve desired educational change in the region. Obviously, no one model or "bag of tricks" can be expected to work. But the Laboratory could, through study, conferences, field studies and demonstrations, simulations, laboratory and field experiments, all focused on the phenomena of educational change, develop an understanding of general patterns which could be communicated to all concerned -- the research centers, foundations, educational service and product firms and other supplies of innovative methods and materials; to the U. S. Office, State Departments of Education, County Offices, and District Offices and other managers and coordinaters; and to the direct consumers -- districts, communities, schools, and classrooms.

ADJUSTMENT OF CURRENT LABORATORY PROGRAM

What might such a Laboratory program entail? It could pick up many of the present ideas and interest now in the Laboratory's plan or in the minds of its professional staff. First, let us consider the two service functions:

Information Dissemination and Utilization. This activity is now represented in the Lockheed contract. In addition, an educational T.V. series is under study which would focus on one group of school personnel -- the teacher -- in an effort to communicate the excitement of educational R & D and to generate some realistic expectation concerning it. The adoption of personnel centered-educational change mission would give direction to these activities by using them to study and accomplish two essential and early aspects of change: the dissemination of information and the legitimation of change. The first stage is concerned essentially with information, in creating a climate of interest, in getting people to be aware of educational R & D and in supplying answers to requests for details. The purpose of this stage is to create a social, political, and educational climate among people who are in a position to influence decisions. The second step usually involves a more focused and often interactive effort which seeks to dispel fears and objections and to develop favorable dispositions toward the need for change and toward new programs and practices. The aim at this stage is to convince people of the need and of the availability and merit of solutions.

<u>Education of Teachers and Other Professionals.</u> This area would become of considerable importance in terms of the understanding and using the role of teachers and other school personnel in effecting educational changes. Actually, little would change in this area since its present aim is one of facilitating the introduction of newly developed materials and techniques in the schools through programs of education and re-education. Adoption of a personnel change mission would strengthen this program activity by more clearly interrelating it to the other program aims of the Laboratory.

* * *

We conclude that both service functions of the Laboratory could be strengthened and provided with more specific direction by focusing on the parts they could play in both general and specific projects to accomplish change in the region. They would certainly profit by the analysis of the roles of personnel in educational systems and in turn would contribute to a better understanding of how communication and professional education serve to facilitate change. Obviously, the focus on change could lead to clearer criteria for the management and evaluation of these service functions; e. g., just what kinds of communication or education projects ought to be undertaken if we are to understand and foster change in people in the educational system; what attitude, values, knowledge, habits or skills were in fact changed as a result of projects and what implications do these studies have for the larger problem of change.

It seems that eventually there might be opportunity for some redirection of the service area with emphasis on dissemination or education which focused on the process techniques of change itself as well as on the use of these techniques in specific circumstances as means to ends of accomplishing change.

When we turn to the present concept of the Laboratory's R & D program, we again see the possibility of unification without great violence to existing plans and interests, but with some narrowing and clarification of what and how areas would be studied. Presently, we have three major interests: full education, curriculum, and instructional methods. An R & D effort focused in change phenomena can subsume these three interests.

Full Education. This interest would undoubtedly be modified to entertain the full environment -- including home and community as well as school in an effort to understand those factors which influence the selection and attainment of educational goals. Because of the complexity of these factors in minority groups, interest in developing models and strategies for educational change, and development of practical techniques for implementation in minority and culturally disadvantaged settings would undoubtedly be an important aspect of the Laboratory effort.

Curriculum and Instructional Methods. The Laboratory's interest in curriculum and instructional methods would probably be coordinated and primarily used as the technological vehicles for field study and experimentation in social change. This would call for case studies and cooperative ventures with schools and districts in the region in order to not only assist in the evaluation and choice of curricula and methods to match particular school and community conditions, but to also influence design, development and implementation. A case can be made for analysis, model building, simulation studies and controlled experiments to better understand the problems of introducing and articulating new curricula and methods with the old. The major modification in current plans might be in placing greater emphasis on the personnel aspects of curriculum or method design and implementation. In this sense, the Laboratory would become "expert" in what kind of things need to be developed or modified if specific products of educational technology are to gain acceptance, be adopted and survive in the several kinds of schools and communities in this region.

* * *

The above suggest that there is "something for all" in such a Laboratory mission. Not quite. There is a focus and it is on how to improve education in the region by fixing on the problems of organizational change -- with special (but far from exclusive) interest in the personnel requirements. Hence, our basic interest would be on how can we best inform, persuade and educate the key decision makers and professional workers in education so that responsible plans can be made and executed for improving educational systems in the region.

Hence, our choice of studies and projects would be guided by this basic interest. We would need to inform ourselves of many things. Measurement, evaluation, and laboratory and field experiments would remain desirable, probably essential, activities. However, the kind and extent of a particular activity would now be subject to allocation priorities in terms of the eventual contribution of that activity to the overall mission of the Laboratory.

We shall need to draft and redraft the mission statement. Here's a start:

MISSION STATEMENT

The mission of the Far West Laboratory for Educational Research and

Development is to foster improvement in education. To accomplish this objective the Laboratory will undertake a program of research, development, and dissemination focusing on the analysis and facilitation of educational change with primary emphasis on the personnel aspects of system change. It will concern itself with the problems encountered in creating favorable climates, in communicating with and influencing decision makers, in evaluation of readiness, in planning for and execution of projects, in the preparation and training of involved personnel, and in evaluation and adaptation to existing circumstances.

Study of these problems will be undertaken by all appropriate techniques, including surveys, field studies, simulations, laboratory studies and field experiments and demonstrations. The purpose of these studies will be to form a body of information that can be applied to the problems of change and improvement at all educational levels in the region including classrooms, schools, school systems, communities and states.

ILLUSTRATIVE PROJECTS FOR A PERSONNEL CHANGE PROGRAM

COMMUNICATION AND MASS MEDIA

1. The Role of Educational TV in Creating a Climate for Educational Change:

The Far West Laboratory is now considering sponsoring a series of TV programs aimed at teachers and programmed to communicate an interest in and realistic expectation toward a variety of educational R & D activities and innovations. This activity could be used as a vehicle for study of the effect of such programs on teachers and other school personnel. Effects of specific programs and of the entire series could be studied by using panel techniques of public opinion polling. Obviously, analysis of this information could provide valuable feedback in deciding upon the content of future programs.

It would also provide a device for reaching larger numbers of school personnel and involving them in specific ways, both with the Laboratory and educational R & D. The result of this project would be information on how to use such a medium. A by-product would be the creation of favorable attitudes among teachers and others in the region.

CURRICULA

2. Personnel Aspects of Implementing New Science Curricula and Course Content Improvement Materials:

The Far West Laboratory has submitted a project proposal to N.S.F. which could contribute greatly to understanding personnel problems in introducing new curricula. Specific objectives of this project include: ". . . (2) To increase the adoption and successful use of new science curricula and course improvement materials in the schools; (3) To develop and maintain effective lines of communication among public school administrators, science teachers, persons involved in developing new science materials, and the Laboratory Project Staff; (4) To identify and describe problems encountered by teachers and administrators in implementing specific science materials, and suggest possible solution." This project could serve as a useful case study approach to the problems encountered. Results of this project could lead to recommendations for specific situations as well as information that could be applied throughout the region in cases where curriculum changes are involved.

INSTRUCTIONAL METHODS

3. Personnel Implications of New Instructional Methods and Technology Projects:

There are a variety of studies and projects in this region which are introducing new methods; e. g., micro-teaching, CAI, I.P.I., team teaching, programmed instruction. A preliminary project in this area could attempt to document by literature search and case studies the experiences of those who have attempted to make applications. What happened to the roles of teachers, principals, students and other school personnel? What are the implications of the method per se for people? What are the implications of the attempt to introduce the methods for people? Are there any generalizations that can be made? Results of this project could be of value to schools and districts planning to introduce new instructional methodology. The project would also suggest factors to be considered in research design and development.

TITLE III COOPERATION

4. FWL-PACE-School Cooperative Project:

Eventually the Laboratory would wish to establish relations with supplementary (PACE) centers and school systems to study change and innovation problems. In this kind of project the Laboratory could provide leadership and coordination in establishing better control and evaluation of change projects by sponsoring conferences and participating in the planning, conduct and analysis of selected PACE innovation activities. This project would provide a basis for undertaking and working out of appropriate roles for the Laboratory and PACE centers in cooperative R & D efforts.

TITLE I COOPERATION

5. Problems of Accomplishing Change for the Educationally Disadvantaged:

Because of the special need and interests in improving education for the culturally different or disadvantaged, the Laboratory could devote some of its interests to this area. Such a project could well include consideration of the community, the ethnic subculture, the school, teachers, and children in asking where and how change may be best accomplished in order to improve education in rural and urban slums and in areas with high concentration of disadvantaged children. Obviously, cooperation with Title I projects could be obtained and findings would have relevance to change strategies used by Title I administrators.

R & D CENTER COOPERATION

6. In-Service Education of Teachers and Other School Personnel as an Adjunct to the Accomplishment of Educational Change:

The Laboratory is now engaged in a survey of current re-education activities and is also fortunate in being near the R & D center for teaching at Stanford. Out of this study we could hope to find alternative approaches for re-educating teachers in the use of specific innovations. The results of this project would be tested approaches for the re-education of teachers in varying local situations and experience that could be applied broadly in the region for use in disseminating ready-to-use content and methodology through teachers and other school personnel. Moreover, it could establish a working relation between the Stanford R & D center for teaching and the Laboratory.

STATE AND COMMUNITY COOPERATION

7. Higher Level Change Problems:

Whereas the curriculum, instructional methods and FWL-PACE projects would focus primarily on change at the classroom level or the building level, this project would specifically consider the problems of change and personnel involvement at higher levels; specifically, the district, county and state office levels. Information would be collected by literature search, interview, questionnaire and observation with focus on how goals, attitudes, beliefs and role expectations in different groups in these systems operate to influence problem identification, selection and support of innovative projects. Experience in this area could lead to a better understanding of educational change and the proper choice of strategy and use of change agents at these levels.

FUNDAMENTAL R & D: CHANGE THEORY AND EXPERIMENT

8. Laboratory and Simulation Studies of Personnel Involved in Change:

Whereas most of the projects listed above involve survey, case study and field study of change, this project would attempt to bring some kind of analytic and experimental rigor to the analysis of change by the design and conduct of laboratory studies of change. During the early stages these studies would undoubtedly be quite diverse in nature but could focus on specific problems of change, persuasion, communication, group dynamics, problem identification and solution, resolution of conflict, bargaining, re-education for new skills, etc. Such studies would seek to explore and clarify hypotheses and theories in psychology, sociology, political science and economics which bear on the problems of social change and cultural diffusion in education.

FUNDAMENTAL R & D: CHANGE EVALUATION

9. Measurement and Evaluation of Change:

There are special difficulties for those who attempt to design research on or evaluate change. This project would attempt to develop for the Laboratory an awareness of these problems and the present state of the art with respect to their solutions. Through literature search, conferences and consultants the Laboratory would attempt to organize and disseminate information on the design of projects and measurement of change. This would be accomplished through conferences, publication of reports, and cooperative consulting in selected cases.

IMPLEMENTATION OF CHANGE

10. Change Institutionalization and Implementation Project:

This project would be specifically concerned with the development and dissemination of effective methods for planning and managing change and for institutionalizing change functions within the region's school systems. It would seek out and evaluate methods for accomplishing these ends, using all techniques available, but probably depending heavily on expert opinion and informed judgment to compensate for lack of more rigorously obtained data. This project would attempt field studies of a variety of strategies for creating or improving change agents and R & D functions within the school systems, and would also explore various cooperative arrangements between schools and outside change agents in order to better understand what roles need to be played by the different parties at various phases in implementation of change in the schools.

BACKGROUND INFORMATION

This mission is not novel, except for its special focus on the personnel aspects of the change problem. Thanks to an article by Sidney Eboch, (1966), we have the following summary.

BASIC SOURCES

Paul Mort and Francis Cornell's American Schools in Transition, (1941), is generally credited as the most extensive work in education related to the change process. Over the past 35 years some 200 studies have been conducted, but most of these have been either on school administration and organization or on adaptations of practices over time -- "the diffusion" aspects of change. Recently, Matthew Miles' collection of papers, Innovation in Education, (1964), has become the prominent book. It is divided almost equally among case studies of innovation, research and theory, and comment and discussion. Clark and Guba are cited as holding perhaps the most comprehensive view of educational change.

CONFERENCES

Also, recently, there have been a series of conferences sponsored by various organizations; e. g., Media and Educational Innovation, University of Nebraska, W. C. Meierhenry, director; and Strategies for Educational Change, The Ohio State University, Virgil Blanke, director. These conferences have especially attempted to learn about the subject of change by study in other fields (primarily, rural sociology and social psychology and occasionally anthropology, philosophy and political science). Another relevant conference report is by Richard O. Carlson, Change Process in the Public Schools, (1965).

INSTITUTIONAL EMPHASES (The following is quoted in full from Sidney Eboch.)

Columbia University -- Matthew Miles and others continue the tradition of Paul Mort with several studies and a major project related to organization development.

University of Kentucky -- "The Program on Educational Change," directed by Richard Miller, is conducting several surveys related to change in Kentucky.

The University of Michigan -- The Institute for Social Research, under Ronald Lippitt, is conducting research related directly to diffusion in education.

The Ohio State University -- The recently organized School of Education includes a Development Division, directed by Virgil Blanke. Members of this Division are conducting a variety of research projects related to change and curriculum development, materials production, and field testing.

University of Oregon -- The Center for the Advanced Study of Educational Administration has conducted seminars on change for administrators. Richard O. Carlson has done studies relating administrative characteristics and diffusion of new programs.

University of Southern California -- The now completed Technological Development Project, under James D. Finn, produced a series of publications related to an assessment of technological change in education.

ORGANIZATIONS

Many organizations have formed special "action" agencies related to change processes or the study of change. There are also many smaller institutional efforts and isolated individuals who are making substantial contributions. The intent of this summary is only to identify some of the most prominent organizational efforts on the change process.

Cooperative Project on Educational Development. /This is a three-year project supported by a grant from the U. S. Office of Education and carried out by eight colleges and universities in five regions, with coordination by the National Training Laboratories of NEA. Participating institutions are University of Michigan in the Detroit region, University of Chicago in the Chicago region, Temple University in the Philadelphia region, Boston University and Lesley Teachers College in the Boston region, and Columbia Teachers College, Yeshiva University and Newark State Teachers College in the New York region. There are approximately five school systems cooperating in each region. The University of Wisconsin R & D center (center for Research and Development for Learning and Re-education) is informally affiliated. The purposes of COPED are to conceptualize about, develop, and study models of planned change in school systems. The major action outcome is to be the development within school systems of self-renewing research and development functions to critically meet changed needs.7

AERA Committee on Research Utilization. Ostensibly devoted to speeding research into practice, this group of the American Educational Research Association is also concerned with several dimensions of the change process.

State departments of education. Following the lead of Henry M. Brickell's report for New York state, Organizing New York State for Educational Change (Albany, New York: State Department of Education, 1961), Washington and Kentucky have conducted similar surveys of educational change within their states. New York state has acted somewhat upon Brickell's recommendation by creating a "Center for Innovation in Education." This agency will foster, support in part, and disseminate innovative practices of local schools. The Learning Institute of North Carolina is another action agency devoted to encouraging and supporting change throughout the schools of the state.

Federal government. The emphasis on creating change is obvious throughout the Elementary and Secondary Education Act of 1965. Perhaps most explicitly related to the change process are Title IV, creating the regional educational laboratories, and Title III, supporting innovative and exemplary demonstration centers.

/ Undoubtedly, many of the regional laboratories will also be involved in the problems of change; in fact, it would be hard for any laboratory to deal responsibly with its mission without being concerned wi such problems. We are proposing that by focusing on the personnel aspects of change in education — by asking what does and should happen to children, teachers and parents, as well as superintendents, educational support, staff personnel, and others, when changes are attempted, and what these people in turn do to modify the form and effect of the change — we can better understand and accomplish the kinds of change which are needed and must be effected in this region. /

<u>Quasi-research and development agencies.</u> A variety of new organizations is being created to facilitate, and sometimes to study, change in education. System Development Corporation has conducted a series of studies and performed a number of consultant services related to the change process. Educational Services Incorporated was formed to continue the kind of activities conducted by the Physical Sciences Study Committee. The Institute for Educational Development was created to bridge the gaps among "materials inventors," commercial development, and classroom field testing.

MISSION CRITERIA

1. Does this mission hold reasonable promise of meeting a clearly felt educational need? It would appear that it has high probability of meeting a number of educational needs by providing information needed to implement a variety of educational innovations.

2. Does the mission have a clearly defined, single focus? It appears that this mission may be weakest in this particular respect. The focus is a broadly

defined one and there may be some question as to the narrowness of focus. However, the mission has clearly narrowed all possible approaches to a considerably limited one; namely, the question of effecting educational change and, particularly, the question of how the actors in the educational system must be considered, both in planning and designing and in the diffusion, implementation and adaptation of educational innovations.

3. Is the mission broad enough to include several levels of task ranging from direct service at the classroom level to testing significant theoretical constructs at the national level? The mission seems to hold up well in this respect. It promises to have a variety of services at the classroom level. The weakness with respect to theoretical constructs lies in the present lack of adequate theoretical constructs with respect to change. The promise here then is that the Laboratory would participate with others now interested in change in contributing to development and testing theoretical propositions with respect to change and, particularly, with respect to personnel involved in change.

4. Will the mission have sufficient output to sustain its own momentum; that is, does it provide for both short-term and intermediate as well as long-term payoffs? This mission seems particularly effective with respect to this criterion. It gives definite promise of short-term and intermediate payoffs and also promises to cover a sufficiently interesting and complex field of investigation to provide for continuing payoff well into the future.

5. Will the mission permit the development of self-evaluative and corrective feedback procedures? Because of the wide range of activities, it appears

that more feedback and evaluation may be provided with respect to some projects than with respect to others. However, because of tying the activities into meaningful efforts to be accomplished within the schools of the region, feedback information will be available and normally within reasonably short periods of time. Problems will still exist, though, with respect to its evaluation.

6. Is the mission well suited to the regional educational climate, the regional resources and the talents of the Laboratory staff? It would appear that this mission is particularly suited with respect to this question. The West Coast is an area where change is particularly evident and where there is a wide diversity of activities. The resources of the region with respect to consultants and schools that would be interested in participating are especially rich. Moreover, the mission is sufficiently broad in its range of activities so that it could fully employ the diverse talents of the Laboratory staff. Moreover, the nature of the mission is such that it would probably enhance the development and exchange of skills and information among staff members as well as creating a wide range of involvements with other agencies in the region.

IMPLICATIONS OF ADOPTION OF THIS MISSION FOR FAR WEST LABORATORY

1. The mission is conservative in the sense that it easily incorporates existing program plans and interests while bringing a sense of unified mission and purpose.

2. The mission is broad in the sense that it attends to a wide variety of inputs and outputs. That is, it provides for incorporation of curriculum, instructional methodology, hardware technology, in-service training, organizational

and community factors in approaching the problems of improving schools.

3. The mission is also broad in the sense that it provides for a wide variety of cooperative involvements, including the R & D center at Stanford, Title III and Title I activities, as well as schools and other educational organizations. However, in each case it serves to define our possible involvement in terms of cooperative effects to understand, experiment with or validate change and innovative procedures.

4. The mission is practical and field oriented in the sense of interest in here-and-now solutions to change and innovation. It promises to be acceptable and visible because many of the studies and demonstrations will be concerned with helping schools to solve problems and develop better here-and-now techniques for legitimation, adoption and adaptation of innovations.

5. The mission is strategic and timely in that by focusing on the immediate problems of personnel and change it promises to produce useful results in the near future and to continue productively for a long time. However, by working for general principles and understanding, the Laboratory can serve as a mediator or catalyst rather than expending resources on abstract, narrow, or entirely applied efforts.

6. The mission is flexible in the sense that it may adjust focus in terms of a wide choice of projects according to educational developments (needs, capabilities, resources) within the region.

On the other hand:

7. The mission is not strongly oriented to experimentation. Opportunity

and justification for experiments exist, but the nature of the activity is such that much of its data gathering will entail field study approaches which so often lack in good control, abound in variables that may influence effects, and rarely provide cases in sufficient number to satisfy the statistical minded. The techniques of the anthropologist, historian, political scientist and clinician may be as appropriate as those of the experimental psychologist and sociologist.

8. Moreover, the mission does not provide simple solutions as to what should be done. Choices will still be difficult with respect to allocation of effort and coordination of activity.

9. There are dangers of becoming so involved in service functions associated with field experiments and demonstrations that more productive R & D activities are ignored or attenuated in scope. But conversely the mission does provide opportunity for the Laboratory to have nearly immediate and continuing impact on the problems of improving education in the schools of this region.

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MISSION STATEMENT

TEACHER EDUCATION

I. BACKGROUND

A. History of the Problem

Providing effective inservice education has historically been one of the most difficult problems faced by educators and one which has rarely been solved adequately. With a few exceptions, inservice training programs tend to be stereotyped and unimaginative. In California, over half of the school districts have no inservice programs beyond faculty meetings and teacher institutes (California Teachers Association, 1959). Since most faculty meetings are concerned with administrative matters (Wood, 1950) and most institutes are concerned primarily with orientation and plans for the coming year (Landers, 1954), there is scant effective inservice education available in such districts. Yet there is some evidence to indicate that well planned inservice programs can bring about significant gains in pupil achievement (Mork, 1953).

Educators are generally aware of the deficiencies of inservice education, but few districts have the resources to develop adequate programs. During the Laboratory's recent series of curriculum conferences, Dr. Menesini reported that participants consider inservice education their most pressing problem. The doubtful adequacy of current inservice programs is also reflected in the refusal of nearly half of California's School Districts to accept inservice training, travel, or vocational experience as a substitute for college credits on salary schedules (California Teachers Association, 1965).

Supervision is often regarded as an aspect of inservice training, but in its usual form it is severely limited (Allen & Ryan, 1966). Among the deficiencies of typical supervision are the following:

1. Supervision focuses upon evaluation instead of education and since it is often tied to contracts and tenture, it is psychologically threatening to most teachers.
2. Supervisor's remarks are often couched in general terms and educational platitudes that the teacher cannot translate into specific action.
3. The supervisor is often not trained in the teacher's subject matter area.
4. The supervisor's remarks are often given in a frame of reference that the teacher does not understand or agree with. Teachers and supervisors often disagree in their recollections of what actually happened during the lesson.
5. Supervisor's evaluation and feedback is often delayed.
6. The teacher rarely has an opportunity to try out immediately the supervisor's suggestions.

B. General Statement of the Problem

Micro-teaching as developed in the Stanford Teacher Intern Program offers many significant advantages as a tool for inservice education, and it is proposed that the Laboratory attack the inservice education problem through the use of micro-teaching and similar approaches. In a typical inservice lesson of the sort that would be developed in this mission, the following sequence would be experienced by the teacher:

1. The teacher would study instructional material on a specific skill such as reinforcing desirable pupil responses. Such material could be presented by any of the usual communication media such as text-book, programed text, motion picture, video tape, audio tape, etc.
2. The teacher would then prepare and teach a short lesson to a small group of pupils.* This lesson would be videotaped.
3. Immediately after the lesson, the teacher would watch the videotape playback of the lesson, focusing her attention on use of the skill in question.
4. Immediately after the playback, the teacher would watch another videotape in which a model teacher would demonstrate the same skill. Remarks would be dubbed onto the audio track to prompt the teacher on important aspects of the model's behavior.
5. Immediately after viewing the model tape, the teacher would reteach her lesson in order to reinforce the learned skill.

The effectiveness of this approach has already been demonstrated by research in the Stanford Intern Programs. It has been found significantly more effective than use of a well trained supervisor (Orme, M. E. J., 1966). The advantages of this approach for inservice training appear to be as follows:

1. No supervisor is used, thus, the teacher is not threatened.
2. Since the model is videotaped, it is possible to develop a completely self contained package that can be used in any school by supplying the package and loaning the school a portable camera-videotape recorder-monitor.
3. The training focus is on one <u>specific skill</u> at a time.

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* For those few skills where a large group of pupils is needed to teach the skill effectively, such groups would be employed.

4. The teacher gets immediate feedback from the videotape replay.
5. The teacher gets immediate reinforcement from the reteaching step.
6. Throughout the sequence the teacher is actually practicing the skill, i.e. learning by doing.

C. Relationship to Laboratory Program Areas

The original Laboratory plans included five program areas. The proposed teacher education mission will have four major thrusts: basic teaching skills, teaching in new programs, teaching non-typical groups, and teaching new curricula. The first two of these areas fit into the original instructional methods program, the third into full education, and the fourth into curriculum. Since inservice education is probably the most effective way to communicate new ideas and get them into the classroom, all phases of the proposed mission support the original communication program. Furthermore, there are mission objectives that are directed toward communicating information about each inservice package as it is developed.

In summary, the proposed mission is directed primarily at teacher education, but has major thrusts in the areas of instructional methods, curriculum, and full education. The communication phase is sufficient for communicating the outcomes of the mission, but does not provide an adequate means of communicating the results of research, development and innovation that originate outside of the Laboratory.

II. GENERAL MISSION STATEMENT

A. The proposed mission of this Laboratory is to improve the effectiveness of classroom teachers by developing, evaluating and implementing programs of inservice education based upon models and/or simulations of teacher behavior and aimed at essential skills and knowledge related to basic teaching performance, teaching nontypical pupil groups, teaching in new educational programs, and teaching new curricula.

B. Relationship to Missions of Other Organizations

The proposed mission would involve a close partnership between the Stanford Research and Development Center, the Far West Laboratory and selected Title III Centers. The basic research evidence and theoretical rationale developed at Stanford on the use of micro-teaching and other techniques for preservice teacher education would be applied to the development of the inservice packages at the Laboratory. A well integrated team effort involving the Stanford Research and Development, the Far West Laboratory, and Title III Centers would assure a thorough coverage of all aspects of the research and development effort in the area of inservice education (see Figure 1).

The cooperating group of Title III Centers and their affiliated public schools would contribute to development, field testing, demonstration and implementation of the inservice training packages. It is anticipated that the mission would also involve several colleges and universities in specific activities in which they have special interests. For example, San Jose State might work with the Laboratory on the elementary school teaching skills packages and the University of California might play a major role in developing and testing packages for training teachers of culturally deprived pupils.

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B. Relationship to Missions of Other Organizations

The proposed mission would involve a close partnership between the Stanford Research and Development Center, the Far West Laboratory and selected Title III Centers. The basic research evidence and theoretical rationale developed at Stanford on the use of micro-teaching and other techniques for preservice teacher education would be applied to the development of the inservice packages at the Laboratory. A well integrated team effort involving the Stanford Research and Development, the Far West Laboratory, and Title III Centers would assure a thorough coverage of all aspects of the research and development effort in the area of inservice education (see Figure 1).

The cooperating group of Title III Centers and their affiliated public schools would contribute to development, field testing, demonstration and implementation of the inservice training packages. It is anticipated that the mission would also involve several colleges and universities in specific activities in which they have special interests. For example, San Jose State might work with the Laboratory on the elementary school teaching skills packages and the University of California might play a major role in developing and testing packages for training teachers of culturally deprived pupils.

III. SPECIFIC STATE OF AFFAIRS TO BE REALIZED

A. Immediate

The immediate objectives to be achieved under this mission would be as follows:

1. Laboratory staff members will have developed a thorough knowledge of the present state of the art in preservice and inservice education and will have prepared a monograph that pulls together the work in this area into a comprehensive critical review.
2. An inservice education package that improves the basic teaching skills needed in conventional secondary classrooms will be in operational use in schools of the region.
3. A video tape describing and illustrating this package will have been prepared and shown over educational TV channels in the region and made available nationally to aid in dissemination. A similar video tape will be prepared for each subsequent package.

B. Intermediate

The intermediate objectives to be achieved would be:

1. An inservice education package that improves the basic teaching skills needed in conventional elementary school programs will be in operational use in schools of the region.
2. An inservice education package that improves teacher skill in solving the major teaching problems encountered in teaching culturally deprived urban Negro children in secondary schools will be in operational use in schools of the region. This package could be developed in cooperation with the University of California Internship

Program for teachers of culturally deprived children and could be used in this program as well as in inservice programs.

3. An inservice education package that trains teachers in the skills required to function effectively as members of a secondary school teacher team will be in operational use in schools in the region.

4. A series of televised lessons designed to train teachers to present the new aspects of the Science Curriculum Improvement Study will be in operational use in schools in the region that are adopting this curriculum. This package will also contain tapes or films showing a model teacher presenting each new aspect of this curriculum. These could be used not only in the microteaching package, but also could be shown to pupils when the teacher did not feel sufficiently prepared to offer these aspects of the curriculum herself. A similar effort underway at the University of Wisconsin Research and Development Center is showing promising results.

C. Long Range

The long range objectives to be achieved would be:

1. A procedure will be available for identifying the critical teacher skills and behavior patterns in any teaching situation, and developing those skills to a satisfactory level of effectiveness through an inservice education program.

2. A series of inservice education packages will be in operational use in each of the following areas:

   a. Basic teaching skills. Packages could be developed in such areas as:

(1) Preschool instruction, (2) Primary grades instruction, (3) Intermediate grades instruction, (4) Junior High School instruction and (5) Secondary sch[illegible] instruction (see III A 2).

b. Teaching non-typical student groups. Packages could be developed for such groups as:

(1) Culturally deprived urban Negro high school students (see III B 1), (2) Culturally deprived rural Mexican-American elementary school pupils, (3) Rural Indian elementary school groups, (4) Gifted secondary school students, and (5) Slow learning secondary school students.

c. Teaching in new educational programs. Packages could be developed in such areas as:

(1) Teaching in a team teaching system (see III B 3), (2) Relating classroom teaching to televised instruction, (3) Relating classroom teaching to programed instruction and (4) Teaching in the Individually Prescribed Instructional Program.

d. Teaching new curricula. Packages could be developed that would train the teacher in the most difficult aspects of teaching a new curriculum. Among curriculum packages that could be developed are included:

(1) School Mathematics Study Group (SMSG), (2) Science Curriculum Improvement Study (see III B 4), (3) Greater Cleveland Social Science Program, (4) Roberts' Linguistics Approach to Teaching English and (5) Richards' Threshold to Music.

3. Sample lessons from the curriculum packages could also be used by teachers who are considering a new curriculum for adoption. The experience of micro-teaching one or two sample lessons would greatly help the teacher answer three critical questions:

   a. Can I teach this curriculum?

   b. Do I like the content and the way it is presented?

   c. Is this curriculum appropriate for my students?

IV. PRESENT STATE OF AFFAIRS

A. Preservice Education of Teachers

Teacher education may be divided into the two major areas of instructional skills and subject matter competency, and the two levels of preservice and inservice. In most preservice programs, the skills requirement is met by a combination of formal education courses and practice teaching. The effectiveness of such programs varies, but is generally low. Subject matter competency is a less difficult problem in preservice education, since acquisition of knowledge is a less difficult task than development of complex skills. This work is usually in the hands of the appropriate academic department.

Thus, although variability in quality is great in both areas from college to college, it is probably fair to say that skills preparation in preservice programs is generally much weaker than subject matter preparation.

B. Inservice Education of Teachers

Teacher needs for inservice training in subject matter generally differ somewhat from preservice needs. Since most teachers leave the college or university with a reasonably adequate knowledge of subject matter, their needs in this area develop as changes take place in their fields. New curricula usually introduce subject matter concepts that were not taught when many of today's teachers were in training. For example, a mathematics teacher who was trained in the 1940's might be totally unfamiliar with the "set" concepts that play a major role in most "new mathematics" programs. Thus, the major inservice educational need in the content area is for programs that cover those specific aspects of a new curriculum that are new or unknown to teachers having a general competence in the subject.

In the skills area, most teachers have developed some skills through experience. Such learning is usually inadequate since skills are often developed without any significant help from supervisors or other teachers and without reference to models who have mastered the skills. Thus, unless the teacher has been trained in one of the first preservice programs that focus on the development of basic teaching skills, such as the Stanford University Intern Program, she will usually have need of inservice training in this area.

Many teachers, however, need more than basic teaching skills in order to function effectively. Teachers of atypical student groups, for example, must develop behavior patterns and deal effectively with problems that are unique to teaching situations in which a specific pupil group is being taught. With a few exceptions, such as the University of California program for training teachers of culturally deprived children, the teacher receives no preservice training that prepares him to cope with these unique problems. The vast majority of teachers of atypical pupil groups are in desperate need of inservice training that can help them develop the skills they need.

The teacher who finds herself in a new instructional situation also requires inservice education if she is to develop the behavior patterns needed to function effectively. Many educational innovations that are becoming increasingly important in today's schools such as team teaching, televised instruction, individualized instruction, and computer assisted instruction require the teacher to use skills, and assume roles that were not even thought of ten years ago.

V. TASKS TO BE DONE

A. Developing Teacher Skills Inservice Education Packages

Although there will be some differences in the tasks leading to the completion of different teacher skills packages, the general approach will be similar. The following sequence of tasks would be carried out by the cooperating organizations in preparing a typical inservice education package:

1. Task A - Review the literature, observe and interview teachers, supervisors, and interns in order to identify important skills and behavior patterns needed by teachers in the area to be covered by the training package.
2. Task B - Prepare instructional materials for each important skill identified.
3. Task C - Prepare video tapes showing teacher-models effectively using each skill.
4. Task D - Experienced supervisors would view each model and prepare comments designed to help focus the trainee's attention to critical aspects of the model's behavior. Combine the most effective comments into a composite and superimpose the composite onto the audio track of the model video tape.

5. Take E - Try the package with a sample of teachers in the field and make a preliminary evaluation of each lesson in the package by interviewing the teacher sample and measuring behavior changes brought about by each lesson.

6. Task F - Develop the package further on the basis of feedback obtained in Task E.

7. Task G - Use the package with a large sample of teachers, varying certain aspects of the training in different schools and comparing teacher gains and pupil gains so as to obtain further feedback on ways to develop more effective packages and provide insight on variables related to learning effectiveness.

8. Task H - Make any changes indicated by Task G results, prepare instructions for using the package and disseminate necessary information to schools and other educational agencies in the region.

9. Task I - Implement the package throughout the region and make implementation materials and information available to educators outside of the region.

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MISSION STATEMENT

PERSONNEL REQUIREMENTS AND EDUCATIONAL CHANGE

I. BACKGROUND FOR A MISSION

The Far West Laboratory was designed to foster educational improvement through research and development efforts and their application in the schools. The major question is how a severely limited set of resources may be organized and applied to achieve the greatest improvement in a reasonable time.

The thesis of this mission proposal is that some kind of strategy for organizational change must be involved in any serious, practical effort to improve education and that in the final analysis the more critical problems may be concerned with <u>how</u> change is accomplished rather than <u>what</u> change is accomplished.

A. <u>Change Agencies and Far West Laboratory Mission</u>

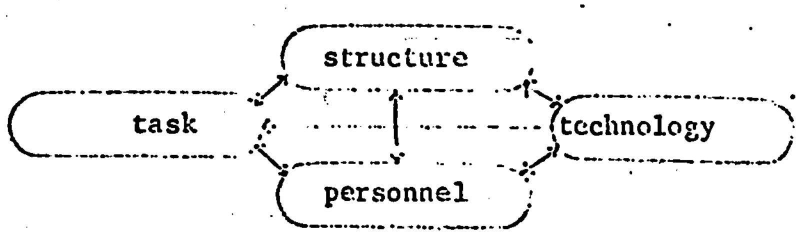
The very existence of the regional laboratories is based on the belief that new means must be found for translating educational R and D products into forms which can be used and for speeding the rate of diffusion of such improved R and D products. The universities and other educational research centers are seen as the sources, while the schools and other educational agencies are seen as consumers or clients. Between them are mediators, including the regional laboratories and the supplementary centers, which are seen as new change agencies for "putting educational research into practice." Presently these new agencies are engaged in a major social experiment of trying to define, initiate, legitimatize, and sustain appropriate roles inside a complex established system of schools, districts, communities, county and state agencies, while responding and adjusting to a wide variety of social, political, and economic interests.

The Far West Laboratory is now faced with the question: How can it find an appropriate focus, theme or mission for its program of research, development, and dissemination? Such a focus is obviously needed to give direction and provide for internal policy, but it is also needed to clarify expectations and define the nature and scope of its external relations. The choice is important because it will influence the image of the Laboratory and have a substantial impact on what the Laboratory may do or fail to do in furthering the improvement of education.

If the Far West Laboratory is to serve effectively as a change agency, what strategy can it follow?"

B. <u>Change Strategy</u>

There are three types of approaches which have been used by practitioners who attempt to change an operational system: structural change ("Let's try team teaching"), technological change ("Let's computerize") and personnel change ("Let's set up an in-service training program"). Now, in practice, any effort at change, whether it be in task, structure, technology or personnel



ultimately involves some change in all elements because they are interdependent. For instance, those focusing on structure must take stands on the kinds of human interaction that support their proposed structure and the kinds that threaten to undermine it. Those focusing on people must cope with the effects of technological innovation. Hence, we accept and underline the fact that: ANY PRACTICAL APPROACH TO EDUCATIONAL CHANGE MUST CONSIDER AND DEAL WITH ALL MAJOR ELEMENTS INCLUDING TASK AND CONTENT, STRUCTURE, TECHNOLOGY AND PERSONNEL.

However, it is difficult to design and accomplish a completely balanced approach which would give even attention to all aspects of structure, technology and personnel. Certainly such a balanced approach would severely limit the scope of our work because of the costs involved. But we should recognize that our emphasis on approach will influence (a) the points of entry into educational systems, (b) the relative importance placed on different components, and (c) the underlying values and goals.

Point of entry relates to implicit assumptions in each approach regarding the causal chain. Structural approaches aim at changing tasks (or goals) indirectly by considering personnel as mediating agents; that is, one changes structure to change people to improve task performance.

The technological approaches see organizations changing not in direct response to new ideas but in response to the availability of the technology that implements the ideas and thereby changes tasks, structures and people. (What would be the consequences of a highly computerized school?) The personnel approaches usually seek to change people to change structure and tools to change task performance and goals and to make life more fulfilling for people.

With respect to relative importance placed on components and underlying values and goals, the technological and structural approaches focus chiefly on problem-solving mechanisms, often developed externally to the organization, while placing relatively less emphasis on the internal operation of the organization and the processes by which new problem-solving means are developed within or adopted into the organization. Personnel approaches tend to focus on the process of change itself -- that is, on the effect that new technique, content, tasks, and structure have on people and how people in turn affect the eventual form, style, effectiveness and efficiency of the introduced content, structure, or technology.

If the above account is valid, it seems that any effort to improve education must attend to the interactions of all major elements in an educational system -- that is, to tasks and their content, organizational structure, technology and personnel. However, we assert that education is essentially a "personnel ascendant" system. In other words, people rather than machines and materials are the major and critical element. Moreover, people appear to be the key element in the diffusion and maintenance of change. Human acceptance of ideas seems to be the real basis of change and emotional resistance the real impediment. The logically superior structure or the technologically superior device is not necessarily the one adopted; more often it is the humanly acceptable or more feasible one. Efforts to accomplish change which do not carefully consider people may result in failure, or if adopted, may cause unnecessary resistance and hardship on the part of the human actors in the system.

Unfortunately, much of the current educational R & D is a component development effort which is often engineered in terms of parochially defined objectives and which is often deficient in field use tests which could influence redesign to fit the larger system. Generally, there is insufficient consideration for the variety of personnel that may be affected. Rarely is attention given by the producer to the way people must be involved in acceptance and use.

Hence, we conclude that a Laboratory mission to accomplish any practical improvement by changing educational systems must attend to all aspects of change, but would do well to give special attention to an area often ignored in R & D, one which must be considered if rate and quality of change are to be effected -- the personnel requirements in a changing educational system.

It seems that the regional laboratory could have a catalytic function by determining what must be done and how to systematize the personnel aspects of educational change. This is not solely a "process" effort. The Laboratory would have to be intimately acquainted with all aspects of the problem -- with curriculum, instructional methods, educational organization, educational materials, teacher training, educational R & D, the community needs, politics, economics, social organization, and so on. The point of focus though would be on how these aspects must be considered and related to achieve desired educational change in the region. Obviously, no one model or "bag of tricks" can be expected to work. But the Laboratory could, through study, conferences, field studies and demonstrations, simulations, laboratory and field experiments, all focused on the phenomena of educational change, develop an understanding of general patterns which could be communicated to all concerned -- the research centers, foundations, educational service and product firms and other suppliers of innovative methods and materials; to the U. S. Office, State Departments of Education, County Offices, and District Offices and other managers and coordinators; and to the direct consumers -- districts, communities, schools, and classrooms.

C. Adjustment of Current Laboratory Program

What might such a Laboratory program entail? It could pick up many of the present ideas and interest now in the Laboratory's plan or in the minds of its professional staff. First, let us consider the two service functions:

1. Information Dissemination and Utilization. This activity is now represented in the Lockheed contract. In addition, an educational TV series is under study which would focus on one group of school personnel — the teacher — in an effort to communicate the excitement of educational R & D and to generate some realistic expectation concerning it. The adoption of a personnel centered-educational change mission would give direction to these activities by using them to study and accomplish two essential and early aspects of change: the dissemination of information and the legitimation of change. The first stage is concerned essentially with information, in creating a climate of interest, in getting people to be aware of educational R & D and in supplying answers to requests for details. The purpose of this stage is to create a social, political, and educational climate among people who are in a position to influence decisions. The second step usually involves a more focused and often interactive effort which seeks to dispel fears and objections and to develop favorable dispositions toward the need for change and toward new programs and practices. The aim at this stage is to convince people of the need and of the availability and merit of solutions.

2. Education of Teachers and Other Professionals. This area would become of considerable importance in terms of understanding and using the role of teachers and other school personnel in effecting educational changes. Actually, little would change in this area since its present aim is one of facilitating the introduction of newly developed materials and techniques in the schools through programs of education and re-education. Adoption of a personnel change mission would strengthen this program activity by more clearly interrelating it to the other program aims of the Laboratory.

* * *

We conclude that both service functions of the Laboratory could be strengthened and provided with more specific direction by focusing on the parts they could play in both general and specific projects to accomplish change in the region. They would certainly profit by the analysis of the roles of personnel in educational systems and in turn would contribute to a better understanding of how communication and professional education serve to facilitate change. Obviously, the focus on change could lead to clearer criteria for the management and evaluation of these service functions; e. g., just what kinds of communication or education projects ought to be undertaken if we are to understand and foster change in people in the educational system; what attitudes, values, knowledge, habits or skills were in fact changed as a result of projects and what implications do these studies have for the larger problem of change.

It seems that eventually there might be opportunity for some redirection of the Laboratory's service area with emphasis on dissemination or education which focused on the process techniques of change itself.

When we turn to the present concept of the Laboratory's R & D program, we again see the possibility of unification without great violence to existing plans and interests, but with some narrowing and clarification of what and how areas would be studied. Presently, we have three major interests: full education, curriculum, and instructional methods. An R & D effort focused in change phenomena can subsume these three interests.

3. Full Education. This interest would undoubtedly be modified to entertain the full environment -- including home and community as well as school in an effort to understand those factors which influence the selection and attainment of educational goals. Because of the complexity of these factors

in minority groups, interest in developing models and strategies for educational change, and development of practical techniques for implementation in minority and culturally disadvantaged settings could undoubtedly be an important aspect of the Laboratory effort.

4. Curriculum and Instructional Methods. The Laboratory's interest in curriculum and instructional methods would probably be coordinated and primarily used as the technological vehicles for field study and experimentation in social change. This would call for case studies and cooperative ventures with schools and districts in the region in order to not only assist in the evaluation and choice of curricula and methods to match particular school and community conditions, but to also influence design, development and implementation. A case can be made for analysis, model building, simulation studies and controlled experiments to better understand the problems of introducing and articulating new curricula and methods with the old. The major modification in current plans might be in placing greater emphasis on the personnel aspects of curriculum or method design and implementation. In this sense, the Laboratory would become "expert" in what kind of things need to be developed or modified if specific products of educational technology are to gain acceptance, be adopted and survive in the several kinds of schools and communities in this region.

* * *

The above suggest that there is "something for all" in such a Laboratory mission. Not quite. There is a focus and it is on how to improve education in the region by fixing on the problems of organizational change -- with special (but far from exclusive) interest in the personnel requirements. Hence, our basic interest would be on how can we best inform, persuade, and educate the key decision makers and professional workers in education so that responsible plans can be made and executed for improving educational systems in the region.

Our choice of studies and projects would be guided by this basic interest. We would need to inform ourselves of many things. Measurement, evaluation, and laboratory and field experiments would remain desirable, probably essential, activities. However, the kind and extent of a particular activity would now be subject to allocation priorities in terms of the eventual contribution of that activity to the overall mission of the Laboratory.

We shall need to draft and redraft the mission statement. Here's a start:

II. PROPOSED MISSION STATEMENT

The mission of the Far West Laboratory for Educational Research and Development is to foster improvement in education. To accomplish this objective the Laboratory will undertake a program of research, development, and dissemination focusing on the analysis and facilitation of educational change with primary emphasis on the personnel aspects of system change. It will concern itself with the problems encountered in creating favorable climates, in communicating with and influencing decision makers, in evaluation of readiness, in planning for and execution of projects, in the preparation and training of involved personnel, and in evaluation and adaptation to existing circumstances.

Study of these problems will be undertaken by all appropriate techniques, including surveys, field studies, simulations, laboratory studies and field experiments and demonstrations. The purpose of these studies will be to form a body of information that can be applied to the problems of change and improvement at all educational levels in the region including classrooms, schools, school systems, communities and states.

A. Relation of this Mission to Other Organizations

Besides the obvious involvements with R and D centers, supplementary centers, cooperating districts and schools and the state offices of education, which will be discussed later, we note that there are a number of institutions and organizations outside the area which could provide substantial input to the understanding and instrumentation of such a mission. A description of current activities is contained in an appendix to this paper.

III. GOALS FOR A PERSONNEL CHANGE MISSION

We first observe that we view the choice of mission and definition of program as a sequential decision-making activity. The definition of specific goals is contingent on specific program choices and, hence, is subject to change as programs and projects are approved and as they actually develop over time. On the other hand, general goals should be clearly defined.

A. Short Range Goals (6 months to 2 years)

1. To communicate to teachers and other school personnel in the region interest in and realistic expectations toward a variety of educational R and D activities and innovations. The effects of such programs would be assessed by panel techniques of public opinion polling.

2. To generate an expectation and eventually a reputation among regional R and D personnel (e. g., Title I, Title III, R and D centers, state offices of education) for having a practical interest in the problems of dissemination of R and D into the schools. This would be tested by having an independent agency conduct interviews to determine understanding of the Laboratory's mission,

expectations concerning the relevance of its program for meeting regional educational needs, their experiences with and evaluation of material supplied, conferences sponsored and assistance rendered by the Laboratory.

B. Intermediate Range Goals (2 to 5 years)

1. To have influenced the design, development and field testing procedures of at least three educational research organizations in such a manner that greater awareness and care is given to the influence their R and D products have on people and the influence people have on the adoption and use of their products. Evaluation would be based on case study of a sample of educational R and D organization.

2. To have devised and operated at least one in-service training program for teachers or other school personnel focused on their roles in the accomplishment of educational change. Assessment would be in terms of understanding and behavior in simulated and real situations and by follow-up on the job.

3. To have examined and communicated to Title I directors and others interested in the educationally deprived and culturally different, strategies for accomplishing change in these situations. Assessment would be in terms of the adoption and experience in the use of these strategies in specific situations.

C. Long Range Goals (5 to 10 years)

1. To have established a program of laboratory and field demonstration studies of change phenomena with special emphasis on communication, persuasion, overcoming resistance to change, decision-making and conflict resolution. Achievement of this goal would be assessed in terms of the information and

demonstration value attributed to the program by educational researchers and change practitioners (supplementary center directors, school superintendents, educational consultants).

2. To have created at least one program (possibly in cooperation with Title III centers) for institutionalizing within a school system innovation, evaluation and implementation on permanent, self-sustaining basis. Achievement of this goal would be confirmed when the program was successfully replicated (with necessary adaptation) at least once in a typical urban community and again in a rural area.

3. To have produced at least one book and a series of papers, conferences, and educational television programs on the change topics (e. g., the actors and their roles in the accomplishment of change; studies in introducing new curricula in the schools; studies in the effect of new educational technologies on school personnel; checklist for educational researchers who want to produce an implementable product; checklist for school personnel who want to improve education; the measurement and evaluation of change).

4. To have established or contributed to the establishment of a system for communicating regional R and D activities. The test would be that educational researchers and change agents (including superintendents and their staff) could locate and obtain information about major on-going and completed research, development and demonstration activities in the region.

IV. PRESENT STATE OF AFFAIRS

The quantity and quality of innovation and experimentation in education has increased markedly in the past few years and promises to expand even more markedly in response to federal, state, and private funding. In some cases new curricula and technology are being advanced by specialists far removed from the classroom and little interested in the problems of adopting their approaches to the total educational system. In many cases the new technological and methodological components are similar to "new wine in old wine skins," full of promise but not palatable or containable in the existing schools. Some counsel revolution---a radical remaking of our school. In fact though, the educational establishment has great inertia and will probably be changed more by evolution in which there is a concerted and planned effort to involve the major actors in the system and to design and accomplish transitional stages of change. Such a strategy implies great skill in communication and persuasion and a readiness to compromise and accommodate in order to achieve consensus regarding goals and methods. We are not so much lacking in innovations, ideas, and even the enabling technology and structural models for change as we are in knowing how to achieve a climate favorable to and supportive of experimentation, evaluation, and modification of educational content and practice. Innovation carries with it both promise and threat. Anxiety and resistance are inevitable. Misguided implementation of under-designed or inappropriate plans for change have occurred and will occur.

The creation of the laboratories and supplementary centers provides the resources for the communication of consumer needs and characteristics to research and development specialists, for the accomplishment of field experiments, tests, and demonstrations, and for the dissemination of information which could enhance the rate of adoption and value to the consumer of implemented innovations. The major deficiency in the existing state of affairs may be the lack of organized information about and techniques for the implementation of change. The Far West Laboratory could provide needed leadership for the Title III centers so that these new organizations could become effective agencies for change.

V. ILLUSTRATIVE PROJECTS FOR A PERSONNEL CHANGE PROGRAM

A. This mission affords some choice as to projects and allocation of resources and priorities. The following are cited as possible projects which could be undertaken.

COMMUNICATION AND MASS MEDIA

1. The Role of Educational TV in Creating a Climate for Educational Change:

The Far West Laboratory is now considering sponsoring a series of TV programs aimed at teachers and programmed to communicate an interest in and realistic expectation toward a variety of educational R & D activities and innovations. This activity could be used as a vehicle for study of the effect of such programs on teachers and other school personnel. Effects of specific programs and of the entire series could be studied by using panel techniques of public opinion polling. Obviously, analysis of this information could provide valuable feedback in deciding upon the content of future programs. It would also provide a device for reaching larger numbers of school personnel and involving them in specific ways, both with the Laboratory and educational R & D. The result of this project would be information on how to use such a medium. A by-product would be the creation of favorable attitudes among teachers and others in the region.

CURRICULA

2. Personnel Aspects of Implementing New Science Curricula and Course Content Improvement Materials:

The Far West Laboratory has submitted a project proposal to N.S.F. which could contribute greatly to understanding personnel problems in introducing new curricula. Specific objectives of this project include: ". . . (2) To increase the adoption and successful use of new science curricula and course improvement materials in the schools; (3) To develop and maintain effective lines of communication among public school administrators, science teachers, persons involved in developing new science materials, and the Laboratory Project staff; (4) To identify and describe problems encountered by teachers and administrators in implementing specific science materials, and suggest possible solution." This project could serve as a useful case study approach to the problems encountered. Results of this project could lead to recommendations for specific situations as well as information that could be applied throughout the region in cases where curriculum changes are involved.

INSTRUCTIONAL METHODS

3. Personnel Implications of New Instructional Methods and Technology Projects:

There are a variety of studies and projects in this region which are introducing new methods; e. g., micro-teaching, CAI, I.P.I., team teaching, programmed instruction. A preliminary project in this area could attempt to document by literature search and case studies the experiences of those who have attempted to make applications. What happened to the roles of teachers, principals, students and other school personnel? What are the implications of the method *per se* for people? What are the implications of the *attempt* to introduce the methods for people? Are there any generalizations that can be made? Results of this project could be of value to schools and districts planning to introduce new instructional methodology. The project would also suggest factors to be considered in research design and development.

TITLE III COOPERATION

4. FWL-PACE-School Cooperative Project:

Eventually the Laboratory would wish to establish relations with supplementary (PACE) centers and school systems to study change and innovation problems. In this kind of project the Laboratory could provide leadership and coordination in establishing better control and evaluation of change projects by sponsoring conferences and participating in the planning, conduct and analysis of selected PACE innovation activities. This project would provide a basis for undertaking and working out of appropriate roles for the Laboratory and PACE centers in cooperative R & D efforts.

TITLE I COOPERATION

5. Problems of Accomplishing Change for the Educationally Disadvantaged:

Because of the special need and interests in improving education for the culturally different or disadvantaged, the Laboratory could devote some of its interests to this area. Such a project could well include consideration of the community, the ethnic subculture, the school, teachers, and children in asking where and how change may be best accomplished in order to improve education in rural and urban slums and in areas with high concentration of disadvantaged children. Obviously, cooperation with Title I projects could be obtained and findings would have relevance to change strategies used by Title I administrators.

R & D CENTER COOPERATION

6. In-Service Education of Teachers and Other School Personnel as an Adjunct to the Accomplishment of Educational Change:

The Laboratory is now engaged in a survey of current re-education activities and is also fortunate in being near the R & D center for teaching at Stanford. Out of this study we could hope to find alternative approaches for re-educating teachers in the use of specific innovations. The results of this project would be tested approaches for the re-education of teachers in varying local situations and experience that could be applied broadly in the region for use in disseminating ready-to-use content and methodology through teachers and other school personnel. Moreover, it could establish a working relation between the Stanford R & D Center for Teaching and the Laboratory.

STATE AND COMMUNITY COOPERATION

7. Higher Level Change Problems:

Whereas the curriculum, instructional methods and FWL-PACE projects would focus primarily on change at the classroom level or the building level, this project would specifically consider the problems of change and personnel involvement at higher levels; specifically, the district, county and state office levels. Information would be collected by literature search, interview, questionnaire and observation with focus on how goals, attitudes, beliefs, and role expectations in different groups in these systems operate to influence problem identification, selection and support of innovative projects. Experience in this area could lead to a better understanding of educational change and the proper choice of strategy and use of change agents at these levels.

FUNDAMENTAL R & D: CHANGE THEORY AND EXPERIMENT

8. Laboratory and Simulation Studies of Personnel Involved in Change:

Whereas most of the projects listed above involve survey, case study and field study of change, this project would attempt to bring some kind of analytic and experimental rigor to the analysis of change by the design and conduct of laboratory studies of change. During the early stages these studies would undoubtedly be quite diverse in nature but could focus on specific problems of change, persuasion, communication, group dynamics, problem identification and solution, resolution of conflict, bargaining, re-education for new skills, etc.

Such studies would seek to explore and clarify hypotheses and theories in psychology, sociology, political science and economics which bear on the problems of social change and cultural diffusion in education.

FUNDAMENTAL R & D: CHANGE EVALUATION

9. Measurement and Evaluation of Change:

There are special difficulties for those who attempt to design research on or evaluate change. This project would attempt to develop for the Laboratory an awareness of these problems and the present state of the art with respect to their solutions. Through literature search, conferences, and consultants the Laboratory would attempt to organize and disseminate information on the design of projects and measurement of change. This would be accomplished through conferences, publication of reports, and cooperative consulting in selected cases.

IMPLEMENTATION OF CHANGE

10. Change Institutionalization and Implementation Project:

This project would be specifically concerned with the development and dissemination of effective methods for planning and managing change and for institutionalizing change functions within the region's school systems. It would seek out and evaluate methods for accomplishing these ends, using all techniques available, but probably depending heavily on expert opinion and informed judgment to compensate for lack of more rigorously obtained data. This project would attempt field studies of a variety of strategies for creating or improving change agents and R & D functions within the school systems, and would also explore various cooperative arrangements between schools and outside change agents in order to better understand what roles need to be played by the different parties at various phases in implementation of change in the schools.

B. Timing and Order

During 1967 effort would be devoted to establishing relations, study of problems, formulation of plans, and conduct of small scale studies in curricula, instructional methods, and teacher education to clarify the nature of the personnel problems in accomplishing educational change. Through use of educational T.V. and other media the R & D information dissemination program would be initiated. Relations between PACE, R & D Centers, Title I, and State agencies would be developed.

In 1968 specific cooperative studies involving PACE and Title I would be undertaken with cooperating schools in the study and demonstration of changes involving curricula, instructional methods, and in-service training. Exploratory laboratory experiments would be initiated.

The studies initiated in 1968 would be continued in 1969 with some refinement of method. In this year full scale laboratory and field experiments would be initiated.

By 1970 a systematic examination of major alternative change strategies and techniques would be initiated in cooperation with Title III centers. These efforts would include field studies of change methods which might include in-service training programs, use of outside change agents, development of change functions internal to the school system.

By 1971 the studies would be extended to include controlled experiments within schools and exploratory experiments involving districts and communities. The Laboratory by this time would have established an R & D information exchange within the region, would be sponsoring an annual series of conferences and training institutes on planning for educational innovation and its evaluation, and would be conducting a program of applied research directed toward understanding and overcoming the obstacles to change.

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APPENDIX:

BACKGROUND INFORMATION

This mission is not novel, except for its sepecial focus on the personnel aspects of the change problem. Thanks to an article by Sidney Eboch (1966), we have the following summary.

BASIC SOURCES

Paul Mort and Francis Cornell's American Schools in Transition (1941) is generally credited as the most extensive work in education related to the change process. Over the past 35 years some 200 studies have been conducted, but most of these have been either on school administration and organization or on adaptations of practices over time--the "diffusion" aspects of change. Recently, Matthew Miles' collection of papers, Innovation in Education, (1964) has become the prominent book. It is divided almost equally among case studies of innovation, research and theory, and comment and discussion. Clark and Guba are cited as holding perhaps the most comprehensive view of educational change.

CONFERENCES

Also, recently, there have been a series of conferences sponsored by various organizations; e. g., Media and Educational Innovation, University of Nebraska, W. C. Meierhenry, Director; and Strategies for Educational Change, Ohio State University, Virgil Blanke, Director. These conferences have especially attempted to learn about the subject of change by study in other fields (primarily, rural sociology and social psychology and occasionally anthropology, philosophy and political science). Another relevant conference report is by Richard O. Carlson, Change Process in the Public Schools, (1965).

INSTITUTIONAL EMPHASES

The following is quoted in full from Sidney Eboch:

Columbia University--Matthew Miles and others continue the trad[illegible] of Paul Mort with several studies and a major project related to org[illegible]zation development.
University of Kentucky--"The Program on Educational Change," di[illegible]ed by Richard Miller, is conducting several surveys related to change in [illegible]entucky.
University of Michigan--The Institute for Social Research, under [illegible]onald Lippitt, is conducting research related directly to diffusion in educ[illegible]ion.
Ohio State University--The recently organized School of Educati[illegible] includes a Development Division, directed by Virgil Blanke. Members [illegible] this Division are conducting a variety of research projects related to cha[illegible]e and curriculum development, materials production, and field testing.
University of Oregon--The Center for the Advanced Study of Educa[illegible]nal Administration has conducted seminars on change for administrators. [illegible]chard O. Carlson has done studies relating administrative characteristics a[illegible] diffusion of new programs.
University of Southern California--The now completed Technologic[illegible] Development Project, under James D. Finn, produced a series of publications related to an assessment of technological change in education.

ORGANIZATIONS

Many organizations have formed special "action" agencies related [illegible] change processes or the study of change. There are also many smaller institu[illegible]tional efforts and isolated individuals who are making substantial contrib[illegible]ions. The intent of this summary is only to identify some of the most prominent [illegible]ganizational efforts on the change process.

Cooperative Project on Educational Development [This is a three-[illegible] project supported by a grant from the U. S. Office of Education and carri[illegible] out by eight colleges and universities in five regions, with coordination by [illegible] National Training Laboratories of NEA. Participating institutions are th[illegible] University of Michigan in the Detroit region; the University of Chicago i[illegible] the Chicago region; Temple University in the Philadelphia region; Boston Univer[illegible]ity and Lesley Teachers College in the Boston region; and Columbia Teachers Col[illegible]ge, Yeshiva University, and Newark State Teachers College in the New York reg[illegible].

There are approximately five school systems cooperating in each region. The University of Wisconsin R & D Center (Center for Research and Development for Learning and Re-education) is informally affiliated. The purposes of COPED are to conceptualize about, develop, and study models of planned change in school systems. The major action outcome is to be the development within school systems of self-renewing research and development functions to critically meet changed needs.]

AERA Committee on Research Utilization. Ostensibly devoted to speeding research into practice, this group of the American Educational Research Association is also concerned with several dimensions of the change process.

State Departments of Education. Following the lead of Henry M. Brickell's report for New York State, Organizing New York State for Educational Change (Albany, New York: State Department of Education, 1961), Washington and Kentucky have conducted similar surveys of educational change within their states. New York State has acted somewhat upon Brickell's recommendation by creating a "Center for Innovation in Education." This agency will foster, support in part, and disseminate innovative practices of local schools. The Learning Institute of North Carolina is another action agency devoted to encouraging and supporting change throughout the schools of the state.

Federal Government. The emphasis on creating change is obvious throughout the Elementary and Secondary Education Act of 1965. Perhaps most explicitly related to the change process are Title IV, creating the regional educational laboratories, and Title III, supporting innovative and exemplary demonstration centers.

[Undoubtedly, many of the regional laboratories will also be involved in the problems of change; in fact, it would be hard for any laboratory to deal responsibly with its mission without being concerned with such problems. We are proposing that by focusing on the personnel aspects of change in educatio by asking what does and should happen to children, teachers and parents, as w as superintendents, educational support staff personnel, and others, when ch are attempted, and what these people in turn do to modify the form and effect the change--we can better understand and accomplish the kinds of change which are needed and must be effected in this region.]

Quasi-research and development agencies. A variety of new organizations is being created to facilitate, and sometimes to study, change in educa System Development Corporation has conducted a series of studies and performed a number of consultant services related to the change process. Educational Services Incorporated was formed to continue the kind of activities conducted by the Physical Sciences Study Committee. The Institute for Educational Development was created to bridge the gaps among "materials inventors," commercial development, and classroom field testing.

MISSION STATEMENT

THE INTERACTION OF EDUCATIONAL VARIABLES

I. BACKGROUND

A. Historical Perspective

The rationale for selecting a Laboratory mission must emerge from studying the total picture of education in terms of its current status and most probable directions.

Perhaps never in our history has this picture been more rich and varied or less distinct. A great ferment of innovation and experimentation has been working in education, which promises a higher quality of education and points the way to a more economical and efficient way of providing it. The ultimate directions of this revolution are just becoming visible, and as their focus sharpens they promise to challenge the most entrenched assumptions of the educational establishment and bring forth what many hail as a new era but others shun as a threatening monster.

The most visible of the great changes now underway is in the area of curriculum. Some of the "new curriculum" movements have had little to offer that was really new, but it cannot be doubted that many represent great departures from the curriculum they are replacing. The traditional curriculum had several characteristics that seem worthy of note. It had evolved gradually, was largely the product of educators, and lagged far behind the point of view and level of knowledge of leading scholars in the various disciplines. The typical "new curriculum", in contrast, has been built in a few years rather than a few decades, is largely the product of a small group of leading scholars, and greatly reduces the lag in introducing new ideas and knowledge into the schools.

The revolution in instructional methods, although perhaps less evident to the classroom teacher, promises to bring about even greater changes than the new curricula, and may actually lead to the elimination of the teacher's role as we now know it. As is the case of curriculum, the leaders of this movement have emerged from outside the educational establishment. In fact, these new instructional methods are built on ideas and technology that have developed almost entirely outside of education.

Programed instruction, the first of the new approaches to have an impact on the schools, was based on psychological research and developed primarily by psychologists. Televised instruction similarly was built on a media developed outside of education and has been most successful when manipulated by members of the performing arts rather than by educators. Computer-assisted instruction rests upon much the same theoretical base as programed instruction, but perhaps because of its technological sophistication, it numbers among its leaders not only psychologists but mathematicians, statisticians, engineers and philosophers.

Thus, we see that many of the innovations that promise to revolutionize education are in the hands of advanced scholars and specialists who have little or no experience in the public school classroom and little appreciation of the total educational picture. This situation carries within it both a promise and a threat. The promise comes from the infusion of new ideas, new viewpoints, and new skills, unfettered by a commitment to the past or to a rigid establishment. The threat comes from the lack of interest in the total educational system and the lack of communication among the specialists who are at the head of so many significant educational movements. This has led to a shocking lack of articulation both between subject areas and between different educational levels. For example, we have new physics programs that require the pupil to use mathematics in the second grade which the new mathematics programs do not teach him until the fifth grade.

If we may borrow a few terms from the systems analyst, we have a great many fine new components, but these components do not fit together into a workable educational system. There is some validity in the statement that we had poorer components, but a better educational system 25 years ago than we have today because the components of 25 years ago fitted together into a system that worked.

To use an analogy, we could liken the education system of 1940 to a Model T Ford. The parts were primitive, but when you put them together it ran. Today, we still have more than a few Model T parts but we have thrown away many and have substituted the engine from a Cadillac, the carburetor from a Falcon, the body from an MG, and the transmission from a Chevrolet. A great many talented people are building still newer and better parts, but no one is devoting much time to the problem of fitting them together into something that will run.

B. Problem and Rationale in the Context of the Present State of Affairs

Thus, today's educational ferment has created a difficult problem for the educator in the field. His problem is to select from among the many methods and curricular materials available, those combinations that offer a strong probability of success in teaching the various kinds of pupils he has in his classrooms.

At present most educational decisions regarding choice of curricular materials and methods for instructing pupils of a given type must be made almost solely on the basis of administrative judgement. Although we have a considerable body of evidence on curriculum, teaching methods and pupil learning, most of this evidence has been gathered in single variable designs and provides little useful knowledge on the nature of interaction among these variables. In a typical study of teaching methods, the investigator compares the achievement of two initially comparable groups of pupils who are exposed to the same curriculum, but are taught by the different methods being studied. Since pupil characteristics and curriculum are held constant, any differences found between the methods can only be generalized to other pupils and curricular materials that are closely comparable to those in the study. The few studies that have considered more than one variable, such as the work of Doty and Doty (1964), and Orton, McKay and Rainey (1964), suggest that the same combinations of content and method are not the most effective for pupils having different characteristics. Thus, the problem of developing effective combinations can only be solved by a broad program of development, field testing and applied research that will provide a reasonably comprehensive picture of the main effects and interactions of all major content types and instructional methods with learners who differ in essential characteristics. This is a different and challenging problem since a solution that can be effectively used in educational practice must identify and determine the role of most of the major variables that influence human learning.

Yet, this problem must be solved if we are to approach an optimum level of instructional effectiveness.

C. Relationship to Other Problems:

This is a basic problem in education and evidence contributing to its solution will also contribute to the solution of most other problems in education. For example, such evidence would be of major importance in the following areas:

1. Developing more effective curricular materials for special pupil groups such as culturally deprived, mentally retarded, and gifted.
2. Establishing guidelines to be used by curriculum planning groups for selecting instructional approaches, making decisions on amount, type and level of subject matter to be presented, and anticipating teacher needs and problems likely to occur in field use.
3. Developing more effective teacher training programs.
4. Identifying areas where special approaches such as televised instruction, programed instruction and computer assisted instruction are likely to be most effective.
5. Providing a basis for developing instructional packages or "teacher proof" lessons.
6. Defining instructional skills required for effective teaching of given combinations of content, methods and learners.

D. Relationships to the Laboratory's Initial Programs:

To attack this problem effectively requires a program of research and development in which the decisive variables in the instructional situation are manipulated simultaneously. These variables may be classified into at least four major areas: curriculum, instructional methods, pupil characteristics and teacher characteristics. This problem is obviously related to two of the three initial Laboratory research programs, those in instructional methods, and curriculum. The full education program was envisioned primarily in terms of providing better education for groups of pupils who are economically, culturally, or intellectually different.

Thus, because solution of the proposed problem calls for manipulation of important pupil characteristics such as social class, cultural background and ability, it promises to get to the core of the problem posed by the original full education program. When we consider the proposed problem in terms of the two sustaining program of the Laboratory, it may be seen that many of the outcomes of work in this area would have direct implications for teacher education but little evidence directly bearing on the problem of communication would be produced.

II. GENERAL MISSION STATEMENT

A. The Mission

A PROPOSED MISSION FOR THIS LABORATORY IS (1) TO STUDY THE INTERACTIONS AMONG CURRICULA, INSTRUCTIONAL METHODS, AND TECHNOLOGIES IN EDUCATION, (2) DEVELOP EFFECTIVE PATTERNS FOR THEIR USE WITH DIFFERENT PUPIL GROUPS IN DIFFERENT SCHOOL SETTINGS, (3) AND PROVIDE THE SCHOOLS WITH INFORMATION AND PROCEDURES THAT WILL HELP COMBINE THESE MAJOR FACTORS INTO WORKABLE AND EFFECTIVE EDUCATIONAL SYSTEMS.

B. Although this mission does not duplicate the work of any major research activity known to the writer, it would relate to most major programs that are concerned with the learning situation. In many cases the research and development work of other organizations would help identify and define crucial variables that would be manipulated in the later phases of the Far West Laboratory's program. For example, Davis' work on the discovery method (1965), the work of Amidon (1966) and Flanders (1963) on teacher behavior, and Glaser's (1966) work on individually prescribed instruction will probably all have implications for the Laboratory program.

In other cases, evidence emerging from the proposed mission would help to focus and redirect the efforts of other organizations. For example, all of the current efforts to build new curricula would profit greatly from a knowledge of the specific instructional methods that are most likely to result in maximum learning of a given type of content by a given type of pupil. Many of the "new curricula" have failed because lack of such information has led to developing programs that could be taught by few teachers and mastered by few students.

III. SPECIFIC STATE OF AFFAIRS TO BE REALIZED

A. Within two years a procedure for classifying any set of curriculum content in terms of its major characteristics would be developed and communicated to educators in the field. Previous research has already laid the foundations for such a classification system.

B. Within three years the comparative strengths and weaknesses of current curricula in mathematics and science would be identified and preliminary answers to the following questions would be made available to educators in the field:

1. Among curricular materials aimed at the same content area and level, which are more effective for:

    a. Instructing pupils at high, average and low ability levels.

    b. Instructing pupils from culturally different and culturally deprived environments.

c. Instructing pupils having different levels of educational and vocational aspiration.

d. Instructing pupils having different cognitive styles

2. What teaching skills are needed to successfully use each of the major curriculum innovations? What problems are likely to emerge when a school adopts a specific program?

3. What tools are available to evaluate the outcomes of new curricula? What are the limitations of these tools?

C. Within five years most of the major variables in the instructional situation would be identified and defined. Sufficient preliminary evidence would be developed and put into usable form so that school administrators could apply this information to reduce the number of alternatives they must consider in making curriculum and instructional methods decisions. At this point, however, the procedure would not be sufficiently developed to lead to a single recommended approach.

D. Within ten years the main effects and interaction effects of the major variables in the instructional situation would have been explored and a reliable procedure would be available to educators for selecting the combination of instructional method, content, and teacher characteristics most likely to produce the desired outcome when used to instruct pupils of given characteristics.

IV. TASKS TO BE DONE

Achievement of the major goals of this mission would require several years, and would require completion of a series of tasks. Each of these tasks would provide interim information as well as contribute to the ultimate goal towards which the mission is directed. These tasks have been placed in probable sequence and described briefly. Since the later tasks would surely be altered on the basis of knowledge gained in the earlier tasks, the following list must become increasingly tentative as it moves into the future.

1. Review of literature

The initial task of this mission would be an exhaustive review of the literature that would provide the Laboratory with a complete picture of the current state of knowledge in curriculum, instructional methods, teacher behavior, and pupil characteristics. The information obtained from this review would be used to help develop a master plan of programs and projects needed to carry out the mission.

2. Content Analysis

Detailed content comparisons among different new curricula would identify areas where better articulation is needed between subjects on the same grade level and in the same subject at different grade levels. Such analysis would also spell out the educational objectives that each curriculum is likely to achieve. This information could be used by the schools in selecting combinations of new curricula that were better articulated and better adapted to local needs.

3. Measurement and Evaluation

The current Measurement Project fits into this mission. In this project measures and measurement procedures would be identified to assess the overall goals of education. The information produced by this project would be of immediate practical value to the mission in helping appraise the educational outcomes of new curricula as well as being useful to the schools in evaluating special activities such as Title I and Title III projects under PL 89-10. This project could be extended to develop measures in areas where currently available tools are not adequate.

4. Field Tests of New Curricula

Once content and evaluation information becomes available on new curricula, the Laboratory would design and sponsor field tests of various combinations of new curricula to provide preliminary estimates of the interactions among curricular materials, school, teacher, and pupil characteristics. Such field testing, which would be carried out cooperatively with Title III Centers, would provide the schools with additional guidelines on articulation and would also provide preliminary procedures for selecting a combination of new curricula that would be likely to be effective in a school serving certain types of pupils. The exploratory project currently underway to develop evaluation procedures for the Karplus Physics Curriculum may establish guidelines for future efforts in this direction.

5. Relating Curricula to Pupil Characteristics

The Laboratory's analysis and field testing of new curricula could in many cases be incorporated into Title I projects in order to provide detailed information on the specific strengths and weaknesses of each new curriculum in attaining educational objectives for educationally handicapped and culturally deprived children. In this phase of field testing, the Laboratory could design the Title I proposals, Title III Centers could help the schools in implementing new curricula, and both agencies could cooperatively plan and conduct the project evaluation.

Since Title I funds could legitimately be used for such projects, only a limited amount of Laboratory support would be needed. The proposed NSF project in curriculum implementation fits very well into this task and would contribute to some of the aforementioned outcomes.

6. Teacher Skills

Such field testing would also identify skills and information that teachers need to implement each new curriculum. Procedures for measuring teacher deficiencies would be provided to the schools and could form the basis for developing inservice education programs to fit each new curriculum. Such procedures could also be applied by teacher training institutions to improve teacher training programs.

7. Controlled Interaction Research

In addition to providing the schools with a flow of useful information and procedures, the initial activities described above are all essential to later projects which would explore interactions among various components in the educational system under controlled conditions. These later projects would compare possible approaches and test hypotheses suggested in the initial field studies and hopefully would provide basic knowledge about the total teaching-learning process.

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MISSION STATEMENT

TEACHER TRAINING PRODUCT ASSESSMENT

I. BACKGROUND OF THE MISSION

One of the great challenges in education today is that of designing training programs that produce teachers with the necessary knowledges, skills, abilities, and attitudes who can successfully teach the pupils in our schools. How does the public and the profession know that the training programs are successful?---or not successful?

Historically, there have been a variety of approaches to setting standards for performance levels of teachers in what can be thought of as a quality control procedure. First, the state governments have attempted to assure the public of adequately trained teachers through the legislature, state boards of education, and state departments of education. The laws and regulations generated by these groups have determined the nature of the training institutions, the quality of the library and other facilities, and the training level of those who teach there. Further specification for the training of teachers is reflected in the regulation of the credentialing systems.

A second approach to quality control has been through the profession's accreditation procedures. In Nevada and California at least three groups serve as accreditors---each dedicated to a slightly different purpose. The overarching group is the National Commission on Accreditation (NCA). This commission is formed by colleges and universities and recognizes both regional accreditation associations and the professional accreditation associations. General institutional accreditation by the regional associations (Western College Association for California and Northwest Association of Secondary and Higher Schools for Nevada) have as their responsibilities the stimulation of faculties to study their programs and to work toward improvement. Since the conventional job of accreditation has been done for most institutions there is little left but the process of stimulation for self-improvement unless the commission would raise its standards significantly.

The association recognized by NCA that accredits an institution's program of teacher education is the National Council for the Accreditation of Teacher Education (NCATE). Nationally NCATE recognizes nine hundred and fifty institutions that prepare teachers for the profession. Of that number four hundred and forty-nine have been accredited, fifteen of which are in California and one in Nevada. When asked why so few programs were recognized in California, Dr. Rolf Larson, Director of NCATE, said that as a group, institutions in the western states weren't so concerned with this kind of recognition and that many California institutions just hadn't applied.

The third group that works at maintaining and improving standards for teacher education programs in California is the California State Committee on Accreditation. This Committee works cooperatively with WCA and NCATE. Joint visits to institutions are made whenever possible. The state standards for accrediting teacher education programs are embodied in the credential requirements as stated in the Education Code.

The many organizations concerned with teacher education that have committees working on raising standards of teacher education programs make up another group concerned with the development of teacher education programs. Theirs is, however, a recommending role.

An examination of the criteria used by these groups in assessing teacher education programs reveals that they generally include the following categories; a judgment of the procedures of an institution, an examination of the curriculum pattern, the formal qualifications of the faculty, and the courses taken by the students.

The emphasis is on what the student took, not what he learned.

NCATE's seven standards are concerned with:

1. Objectives of Teacher Education.
2. Organization and Administration of Teacher Education.
3. Student Personnel Programs and Services for Teacher Education.
4. Faculty for Professional Education.
5. Curricula for Teacher Education.
6. Professional Laboratory Experiences for School Personnel.
7. Facilities and Instructional Materials for Teacher Education.

A careful reading of the NCATE standards reveals the areas to be evaluated, but the specific standards are, in effect, set by each institution. The areas are concerned with processes and facilities rather than the quality of the product—the performance level of the graduates of the teacher training institution.

Over the years state departments have used three different approaches in determining whether a candidate has been adequately prepared:

1. By qualifying examination.
2. By review of candidate's credentials.
3. By the recommendation of an approved teacher training institution.

Although minimal use is made of examinations in California and Nevada, there is some support for their use. Currently in California teachers may qualify for a Special Reading Teacher Credential by examination, and teachers holding provisional credentials may obtain credential renewal by passing the National Teacher's Examination. Last year Dr. Rafferty proposed to the State Board of Education that a state examination become part of the credentialing requirements. Those who favor examinations contend that such examinations would:

1. Require the student to review what he has learned and to integrate

essential elements obtained in a variety of courses and fields.

2. Screen out those candidates who do not have sufficient background.
3. Encourage institutions to become more selective about admitting candidates to the teacher education program.
4. Raise the profession in the eyes of the public.

The classical argument against examinations is that they straight-jacket training programs. However, this has not been true in other professions where examinations are required before full standing is recognized.

Admittedly, it would be expensive in time and money to examine in any comprehensive way the skills and abilities of the thousands of persons who apply for credentials in California and Nevada each year. Further, the typical paper and pencil tests have severe limitations when measuring the skills and knowledge of a well prepared teacher.

The second approach of reviewing a candidate's academic record for courses taken, hours of credit, etc., has become increasingly difficult with the increased influx of teachers from out of state and with the increasing number of institutions that prepare teachers. In spite of those difficulties the transcript evaluation method is used extensively in both California and Nevada.

The third approach, that of granting credentials to graduates of state approved institutions, is an alternate method used by both Nevada and California. It must be noted, however, that institutions are approved on what they offer, not what is learned.

II. THE MISSION STATEMENT

This mission proposes that the Far West Laboratory develop a series of measures, both conventional and non-conventional, that would determine the effectiveness of an institution's teacher training program by evaluating the performance level of the institution's graduates.

Such an assessment battery could be made available to a variety of groups. Accrediting organizations could use it for recognizing outstanding teacher training education programs in other parts of the country; the states' departments of education could use it as a basis for approving teacher training institutions, then grant credentials on the recommendation of the institution; teacher training institutions could use it as a basis for program planning in program improvement.

In the matter of credentialing it seems expedient and efficient for a state department to accept the recommendations of approved institutions for, after all, the faculty has the best and most complete information on the level of performance of its graduates; however, a check would need to be made on the level of training of the graduates of each institution. If, for example, the average graduate of a particular regional teacher training institution is up to specified standards, then there is no reason why credentials should not be granted. If, however, the average graduate at that institution is not up to the specified standards, the college would be advised to improve its program in the areas determined deficient, or face the consequence of not having its graduates certificated.

Basing approval of teacher education programs on the quality of the teachers produced would encourage some important advancements in the profession. First, this procedure of evaluation would require precisely stated behavioral objectives. The profession would have to determine exactly what a teacher should be able to do at the end of a training period. Second, no rigidity in teacher education programs would exist because only the product, not the procedure or courses, would be considered in the granting of approval. Third, institutions would become more selective in admitting students to the teacher training program. Fourth, in-service education for beginning teachers would become more effective.

III. STATE OF AFFAIRS TO BE REALIZED

The following state of affairs to be realized is presented in a temporal format assuming that this proposed mission were initiated in 1967.

A. By 1968 the Far West Laboratory would have developed a statement defining the skills and knowledge that are:

   1. Essential for the success of a beginning teacher.
   2. Achievable during a collegiate experience.

   This statement should be developed by a variety of participants in the educational community who are both learned and respected.

B. By 1970 the Far West Laboratory would have developed a set of measures that would determine the performance level of an institution's teacher training graduates in as comprehensive a fashion as is possible to do in a week's time. A variety of measures such as situational tests, problem solving situations (that might be simulated with films), micro-teaching demonstrations, stress interviews; and, of course, standard pencil and paper tests of knowledge will be employed.

C. By 1971 the assessment battery would be available for a test run in institutions that would like to participate. The Laboratory would prepare a report on the collected data with a complete interpretation of it to the participating institutions.

D. By 1972 accrediting organizations, professional organizations, institutions of higher learning, and states' departments of education would have had an opportunity to observe the assessment procedures, review the evaluations, and react. Hopefully, the reaction would be favorable and endorsement offered.

E. Additionally, by 1972 all of the region's teacher training institutions would have had a sample of its graduates processed through the assessment center.

F. By 1973 the results of the testing would be compiled and reported to the institutions and to the two states' departments of education. If deemed desirable the Far West Laboratory could assist colleges in development of new teacher education programs based on behavioral goals.

G. By 1976 the states of Nevada and California would adopt the assessment battery and use it as a basis for evaluating the products of teacher training programs and for issuing teaching credentials to graduating students of approved institutions.

H. Also by 1984 NCATE would adopt some form of product testing as a means of accrediting institutions.

IV. PRESENT STATE OF AFFAIRS

In summary it can be said that the profession in general recognizes the problem of developing and maintaining teacher education programs that will insure well prepared graduates for entry into the field. It may also be stated that the profession recognizes the discrepancy between what a beginning teacher is expected to be able to do and what he can do. The profession must accept the responsibility for this state of affairs because it has failed to say in behavioral terms what the product of a training program should be able to do. If this were done, expectations for beginning teachers would be more realistic and in-service education more effective.

As was stated previously, there is in California some interest in the use of tests in the credentialing of teachers. Some individuals who represent leadership positions in state and national organizations have expressed interest in performance tests for teachers as have some California State Department officials.

If the Far West Laboratory were to select this proposed mission, only the present Laboratory program of Teacher Education would be well represented. The next most relevant program would be the Instructional Methods-Program because of the concentration of effort put on teaching skills in training programs. The Curriculum Program would have only incidental relationship with this mission, while the Full Education and Communication Programs would not be represented at all.

It is probable that this mission could not be accomplished by the existing agencies and organizations, but a new group such as ours could establish rapport and command the respect of the educational constituents and bring the mission goals to fruition.

V. TASKS TO BE DONE

A. Initiating the Mission

In the early months of the mission a rather complete paper delineating the objectives of the mission, the current research, and the steps to be taken by both the Far West Laboratory and other members of the profession should be prepared. This document then should be presented in a series of regional colligations where key members of the training institutions and others can attend. This series of colligations will be aimed at decision-makers and influential people such as: the deans of departments of education, directors of teacher training programs, presidents or other officers of organizations such as CTA, NTA, TEPS, AASA, ASCD, officers of accrediting associations such as NCA, WCA, directors of states' credentialing offices, the states' superintendents, county superintendents, selected persons from the school districts, representatives from the states' boards of education and the education committees of the two legislatures.

During the sessions a complete explanation of the project will be presented. It is important that the information given to the participants be disseminated to and discussed with the organizations they represent. This and other feedback loops will be part of the overall plan. The information obtained from the feedback will provide the Laboratory with data so that appropriate steps can be taken to obtain and retain the confidence and support of the profession.

B. Selecting a Board of Experts

The test development phase will be initiated by the selection of a board of experts whose responsibility it will be to determine the skills and knowledges necessary for graduates entering the teaching profession. It is proposed that the set of skills and knowledge that must be learned by the end of the training program be applicable to the broad spectrum of teaching activities. Additionally, the skills and knowledge identified as applying generally will be compared with skills and knowledge required for teaching specialized subjects such as high school English or art. Examples of skills that might be tested are those required in teaching roles such as: the teacher as a problem solver, as the classroom manager, as the demonstrator, as the lecturer, as the asker of questions. Examples of knowledge that might be tested are: the teacher's background for diagnosing learning problems, his level of command of the oral and written language, and his general informational background as might be tested by the Graduate Record Examination.

C. Searching the Literature

After the board of experts has developed the set of skills and knowledge required for entry into the teaching profession, the Laboratory staff will conduct a literature search for the reasons teachers succeed or fail and relate them to required skills and knowledge. This comparison will insure inclusion of critical training requirements in the assessment battery. If it were deemed necessary, a series of depth interviews of failing teachers could be conducted.

The board of experts' statements of skills and knowledges would also be reviewed in relation to the National Assessment Goals.

D. Developing the Measures

A second board of experts would be assembled to locate and select measures that are presently available and to develop measures for areas where none exist.

In the knowledge areas it can be expected that a number of suitable tests would have been published. In the skills areas, however, the best that can be hoped for is material of an experimental nature. Most of the performance measures will have to be developed from scratch.

Members of this board of experts should have had experience with instruments developed for measuring teacher effectiveness, and experience with unusual testing methods such as situation tests. The Laboratory has a good deal of strength in this area considering the accomplishments of our director and the experience of several of the Laboratory's researchers.

E. Trying Out the Tests Informally

As the measures are developed, informal tryouts will be made. Both the skills and knowledge board of experts and the measurement board of experts will review and evaluate the measures. The tests will be analyzed with regard to skills and knowledges deemed teachable and learnable at the end of the teacher training program. It should be emphasized, however, that the measures are not to determine the adequacy of an individual teacher's ability, but rather to determine the effectiveness of the training programs. Neither will the tests predict the success of a teacher since what a teacher does with what he has learned is influenced by a variety of environmental and other factors.

During this period the test criterion will be identified.

F. Administering the Assessment Battery to Graduates of Participating Institutions.

In 1971, when the entire assessment battery has been prepared, the graduates of the participating teacher training institutions will meet as a group for the week's testing. Each teacher will be helped to realize that the results of his tests will be confidential and that they will have no effect on his grades or credential. A stipend and pleasant surroundings should insure our getting the participation we need.

During this trial run selected members of the educational organizations and institutions, etc., should be invited to observe. This process would be another link in the communication chain and another step toward professional acceptance and understanding.

At the end of the test run a complete evaluation of the assessment battery will be made; participating institutions would be given the results of the tests and the Far West Laboratory would redesign the battery as necessary.

G. Planning Longitudinal Validation

Plans for longitudinal validation would be begun as would the evaluation and comparison of the general tests with the specific tests (for example high school English and art teachers) to determine the generalizability of the general test.

H. Testing the Graduates of the Region's Teacher Training Institutions

In 1972, a sample of graduates from each of the region's teacher training institutions would be tested and the results reviewed by the institutions and the states' departments of education.

At the end of this cycle, the Far West Laboratory could make the battery available to a variety of groups. Accrediting organizations could use it for recognizing outstanding teacher training education programs in other parts of the country; the states' departments of education could use it as a basis for approving teacher training institutions, then grant credentials on the recommendation of the institution; teacher training institutions could use it as a basis for program planning.

M.L.KELLEY:AM
1-18-67

MISSION STATEMENT

THE GOALS OF EDUCATION

I. BACKGROUND

A. The Problem

It may be suggested that wealth and power are for a social organism what a bright flame is for a moth. Even as an insect is led to seek its own death by its fascination with light, so a society (or an individual) may be led to disaster by developing an obsession with the acquisition of wealth and power. It would seem to be true that while smaller, non-expansive societies have often endured for thousands if not tens of thousands of years, larger, expansionistic and acquisitive societies seldom endure for five hundred years without experiencing periods of disastrous decline and/or violent and disruptive internal change.

Power, affluence, and an expansive population tend to change the character of a people. Traditional values may become mere slogans and the gap between a people's ideals and their actual behavior may become so wide as to lead to a breakdown in the process whereby succeeding generations are enculturated in acceptable values.

The United States would seem to be particularly liable to experience such a breakdown in the socio-educational process, both because of the magnitude of its power and affluence, and because its population is neither homogeneous nor universally committed to the general ideals of the society.

In any democratic society the educational process has but one overall social goal - to further the development of individuals whose behavior can be accepted and, if possible, respected by the society. Most tribal and folk societies have been remarkably successful, prior to extensive foreign influence, in seeing to it that the overwhelming majority of individuals in the society are socially successful, i.e., conform to the range of behavior accepted and respected by "the people". A perusal of the literature relating to the Sioux, Cheyenne, Apache, and Iroquois, for example, reveals very few cases of individuals failing to develop and behave in an "acceptable" manner.

By way of contrast, however, the United States for reasons expressed above, in part, seems to be failing in terms of this basic overall educational goal. It is not necessary to delineate the exact content of "acceptability" in the United States to see that millions of persons' behavior is clearly "unacceptable". We certainly do not regard alcoholic and drug addiction, suicide, crimes of violence, destruction of property, crimes against persons, excessive conspicuous consumption, antidemocratic behavior, race prejudice, corruption in public life, and waste of natural resources as being socially acceptable behavior, at least in terms of our cultural ideals. Several millions of our citizens are either in prison, are ex-convicts, or are on their way to prison; (and we spend one billion per year on keeping people in prison); millions of our citizens are addicts, either alcoholic or otherwise; millions of our citizens are racially prejudiced enough to attempt to deny the validity of our democratic and equalitarian ideology, and millions of our citizens are mentally sick (which is primarily to say that they are unable to cope with our society). And one could go on and on.

In brief, our society would seem to face a breakdown in the process of producing human beings who are useful and desirable within the context of our sociocultural ideals. And this breakdown has become more notable, more real at the very same time that we have been spending greater and greater sums of money on the schools and have lengthened the time spent by our youth in formal educational contexts.

It can perhaps be argued that one of the major reasons for the failure to produce larger numbers of behaviorally acceptable-individuals in the United States consists in our failure to come to grips with the ultimate purposes of the educational process and with the proper place of the formal school situation in relation to the latter. The schools, in short, seem to have become ends in themselves, as have curricular and methodological innovation. We have perhaps become fascinated with "technique" without understanding its relevance to larger social goals.

As Sterling M. McMurrin stated recently (Saturday Review, Jan. 14, 1967):

> Among the large problems that are always with us, none is more persistent, more pervasive, or more basic than the problem of means and ends--of insuring that our methods, techniques, and instruments are adequate to the ends we seek, that the ends are relevant to our abilities and, above all, not dominated and determined by our means. In a society that feeds on a rapidly advancing and sophisticated technology, the failure to have clear and forceful purposes and viable ends could be disastrous. We could become the creators of a technological order in which our ends would be defined and established by the instruments that were fashioned to serve us rather than by considerations of human value, an order in which the things that matter most would be at the mercy of the things that matter least.
>
> Nowhere is the problem of means and ends more crucial than in education. Confronted by quite remarkable technical possibilities, we are failing to come to grips with the problem of aims and purposes and to define adequately the proper function of the schools--their specialized role in relation to the educative processes of the whole society and their immediate task in the education of the child. Certainly without clear purposes--large and small, direct and indirect--the schools cannot successfully plot their course amid the present revolution of numbers, dollars, and computers. Most revolutions are lost because their aims are ambiguous and ill-conceived. We cannot afford to lose the revolution in education by being overwhelmed by the new technology because we cannot match it with intelligent and resolute purpose.
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> . . . .
>
> In the past, educators have invested excessively in the development of educational methods. There has been too little concern for the substance of education and minimum of interest in its purposes. With the new curriculum reforms the question of substance is gradually gaining the attention which it deserves; but the purposes are still neglected and confused. The all-too-common domination of educational thought by the interest in methodology has meant that method has often been the major determinant of substance

revolution in formal, i.e., school, education which has taken place in the United States since the early nineteenth century has led to the use of many of these techniques and goals without always reconciling them with the needs of American society or with newly-developed innovations and goals.

The process of developing "mass education" agencies has in great part been dependent upon the desires of Americans for "upward mobility" and their conviction that "learning" is somehow related to ultimate "success" in life. Grass roots pressure has led to the proliferation of formal school situations with little regard for well-defined goals and/or the relationship between technique and goal-achievement. It may be suggested that the "school house" has become the modern idol of Americans to which they look for "magic" transformation.

But can the school take the place of conscientious, independent self-development; can the schools, in short, deliver the goods? Or should they? What should be the end result of the educational process in America, and what is the place of the school in that process? Great numbers of American thinkers, such as John Dewey, have long pondered these and similar questions, but the pressures of meeting day-to-day needs usually have led to tactical analysis rather than goal analysis. Nonetheless, the basic significance of the goal problem has led to periodic study and to the preparation of generally similar sets of educational objectives, of which the work of the Pennsylvania Committee on Quality Education (1965), California Framework Committee (1950), National Education Association (1964), Conant (1959), and Gardner (1960), may be cited as examples.

To illustrate the significance of this concern, the Pennsylvania Committee stated: "*The first step* in judging the quality of educational programs is to decide on the purposes of education. What should children be and do and know as a consequence of having gone to school? What are the schools' goals? (italics mine). Even Dr. Patrick Suppes, concerned as he is with innovations in specific curriculum areas, has stated that two major obstacles inhibit the introduction of new mathematics programs in the elementary grades: individual differences among students and "a complicated matter of policy. . . . Practical decisions must be made about the amount of time devoted to poetry and the amount of time devoted to mathematics, or to social studies, or to English, but it is absolutely essential for all of us to realize that *as yet we have scarcely the beginnings of a serious, rational method for making these relative determinations.*" (Saturday Review, Jan. 14, 1967, italics mine).

C. Relationship to Other Problems

It can be argued that the development of an "effective educational system" depends not primarily upon the development of tools (curricula and method) but upon the definition of what constitutes such a system or systems. The tools are secondary and must await perfection, or even initial development, until the task is clearly described. Is it not impossible to evaluate, or provide articulation between innovations until the objectives of the innovations are known and until their relationship to the goals of education are delineated?

The best way to build a house is to draw up plans first. Then the choice of materials and tools can be properly discussed. One can, of course, build a house based upon a prior decision to build around a particular boulder or to use a particular type of stonemasonry. But this latter type of house, unless also carefully planned, will probably not be a satisfactory home. In the same manner, present-day school programs are being erected haphazardly around attractive old and new innovations. But the results are apparently not satisfactory to many people, and for good reason. We really do not know what this collection of poorly articulated units is supposed to achieve; and until we do, we can hardly evaluate the real success or failure of the individual units.

If the above analysis is correct, then the goals of education bear a fundamental relationship to other educational problems. Developments in teacher education, curriculum, instructional method, evaluation of teaching, and evaluation of student achievement are all dependent upon a prior analysis of objectives. Communication or dissemination is also intimately related to goals, since one might well be remiss in spreading knowledge about an innovation without being able to say what the latter is expected to achieve and why. And, of course, these are not mere academic relationships. School districts and taxpayers are expected to spend hundreds of millions of dollars on innovations (to say nothing of traditional practices). Do we not have the obligation of being able to say why they should invest so much in such procedures?

D. Relationship to Laboratory Program Areas

The clarification and analysis of the goals of education bears a close relationship to the "Full Education" program area (see earlier position papers in Full Education). The other program areas, being concerned with curriculum, method, teacher education and communication, are all basically dependent upon the definition and clarification of educational objectives. Reforms in teacher education are, for example, designed to produce successful teacher behavior. But what constitutes said behavior? Does it consist solely in teacher behavior, per se, or in the degree to which specific educational goals are furthered by the presence of a teacher-instructor? It might be possible to "grade" teachers in regard to the observable classroom behavior of their students and themselves but such grading is, or should be, based upon a conception of how such behavior relates to the achievement of goals.

In brief, a mission centering upon the goals of education would serve as a basis for progress in each of the program areas. More significantly, it would embrace all of them, since the translation of a discussion of educational goals into actual implementation will of necessity encompass study and experimentation in curriculum, methods, and teacher behavior, and will result in communication.

II. MISSION STATEMENT

A. <u>The Laboratory Mission</u>

1. Statement: To identify and analyze, in continuing consultation with educators, scholars, and laymen, those goals of education which could represent the result of the educational process in the California-Nevada region, to define those goals in sufficient detail to allow for the development of methods for evaluating individual achievement, and to assist the region's educators in the task of developing and evaluating educational programs which will best yield progress toward the achievement of those goals.
2. Brief Statement: <u>To aid in the development of a systematic approach to the educational process wherein the major goals of education serve as the determinants for specific pedagogical procedures.</u>
3. Discussion: The task of determining the goals of education for the public schools ultimately belongs to society at large or to its representatives (legislators, school board members, elected public officials, et cetera). However, neither laymen nor educators, occupied as they are with a multitude of immediate problems, can ordinarily take the time or have the resources available to develop and analyze in a fundamental manner

the ends of education. It is herein proposed that the Laboratory serve as a vehicle for the communication of knowledge about goals and goal-related achievement to the public and especially to those who are charged with the responsibility of officially formulating and implementing school policy.

This process of communication, to be effective and significant, must involve synthesis, analysis, experimentation, and demonstration, both to disseminate information about goals and to show selected ways in which a given cluster of goals might be realizable.

B. Relationship to Missions of Other Organizations

This proposed mission clearly does not duplicate the tasks of other educational organizations. In terms of avoiding duplication it would seem especially important that this laboratory be certain that its mission be distinct from that of other regional laboratories and especially from that of national research and development centers and Title III centers.

So far as is known, the goals of education mission would provide a fundamental service to the region not now being provided. Furthermore, this mission would enable the Laboratory to make use of, and provide input into, the various programs of research and development centers, Title III centers, state boards of education, and district-level groups. Additionally, the mission would allow for articulation with non-governmental programs and institutions and would make possible a broad look at the total educational process without *a priori*, built-in restrictions.

III. SPECIFIC STATE OF AFFAIRS TO BE REALIZED

A. What

1. Clarification and delineation of the objectives of education and of the schools. One result of this mission would be the analysis and conceptualization of the various objectives of the educational process. This might not necessarily mean that the Laboratory could produce a list of goals which would compose a single system. All possible goals should be considered and, especially when descending below the level of pious generalization, contradictions might not always be eliminated. The society of the United States possesses many internal contradictions, as between, for example, the aggressive profit-seeking ideal held up for emulation by certain sectors of the culture as opposed to the co-operative, generous, and unselfish ideal admired by others. It may well be that there is no single set of educational objectives for the United States and that the Laboratory will produce a series of "goal clusters", which represent possible alternative foci for the culture.

Part of this clarification process should involve the "spelling out" of the logical implications of a given goal. Who does it mean, for example, to prepare people for citizenship in a democratic state? Would school boards, ordinarily representing moderately conservative elements as they do, really be willing to accept democracy (and a "free society") as a goal if they thought about how such a society might be different from the oligarchic republicanism normally found in the United States? In referring to democracy we are, of course, holding up a cultural ideal, a symbol or fetish, as in a tribal ritual, but would we really want it if we knew what its implications were in social, behavioral, economic, and political terms? The Laboratory, therefore, might well produce documents relative not only to citizenship in a representative democracy but also to citizenship in an oligarchic society, an elitist, bureaucratic state, et cetera.

2. Translation of objectives into specific behavioral dimensions capable of evaluation. Even after goals have been analyzed, clarified, and given specificity they will ordinarily not be ready for practical use as criteria for judging the success or failure of educational programs. Therefore, this mission should result in the breaking down of goals into even more specific desired patterns of behavior which can be dealt with through meaningful evaluation instruments. What kind of behavior is typical of a "good citizen" in a representational democracy? What kind of behavior is typical of a person who will be economically "successful" in the United States? Questions such as these will need to be answered before one can meaningfully discuss curriculum and measurement in a number of important subject areas.

3. Dissemination of information on educational objectives and stimulation of goal-centered program development. During the period when the Laboratory is researching points 1 and 2 above, a communication process should be established, utilizing conferences, seminars, television and other media. No systematic approach to education can be expected until the public and educators have become accustomed to thinking in systematic terms. The Laboratory's subsequent innovations may not be implemented unless the field has been properly prepared. Moreover, the Laboratory will constantly need to secure "feedback" from educators, scholars, and laymen for the achievement of points 1 and 2. Hopefully, this communication

program will also stimulate activity on the part of other education-centered agencies.

4. Development of goal-oriented systems or educational models. In close cooperation with school districts and other educational organs the Laboratory should seek to develop, or aid in the development, of systems of innovations which are expected to yield or encourage goal-desired behavior. These experimental models or systems would test theoretically sound programs which are supposed to lead to the achievement of goals and would allow for variable manipulation of components. In developing models for testing, the Laboratory could make use of the innovations of other agencies, as well as its own in-house projects. The testing would of necessity involve:

5. Development of evaluative instruments for educational objectives. The cost of developing these instruments might well preclude testing all goals and, therefore, the models or systems would probably focus upon certain "high priority" goals.

B. To Whom:

Educational objectives obviously apply to all sectors of the population, i.e., all pupils are "targets". Teachers and administrators are also "targets" since their behavior affects learning.

At present, the educational process would appear to be a failure in relation to large numbers of individuals from all classes and from almost all ethnic and cultural backgrounds. Nevertheless, it can be said that it is a failure of a different kind for different groups. That is, it is more likely for an American Negro youth to become involved in crime than for a Caucasian youth; it is more likely for a slum youth to become an addict than for a middle-class youth, etc. On the other hand, it is more likely for a Caucasian of middle-class background to commit suicide or become mentally ill than it is for persons from certain low-income, non-Caucasian backgrounds.

The problem of "failure" is not a simple one. Therefore, the goal of inducing the development of socially acceptable individuals must be visualized as involving a myriad of persons whose specific needs are various and the strategies to be utilized will often have to be heterogeneous. It is, for example, one thing to try to induce good mental health in a person from an affluent, materially successful background, and quite another to try to keep a slum child from going to prison because of a need to steal in order to survive.

The priorities identified by staff and others will determine the particular groups most affected by A-4 and A-5 above. If, for example, we give high priority to providing all youth with a good command of "fundamental skills", then our "target population", as it were, will be those who are at present farthest removed from achieving this ideal. In general, it is to be suspected that low-income and minority group youth will ordinarily be farther from goal-achievement and will, therefore, pose a high priority target for all who are concerned with the realization of educational objectives. The "whom" to be affected will, however, depend upon the results of goal-definition and the determination of how far given groups of individuals are from goal-achievement. The innovations developed to achieve educational objectives will usually have some effect upon all classes of individuals, even though they may have relatively more effect upon certain groups.

C. Behavioral Research:

The realization of this mission will demand behavioral research of several kinds. First, it will be necessary to synthesize existing knowledge and carry out observational research in order to be able to state what educational goals are now being pursued or are desired in the United States (we must descend below the level of verbally accepted goals to those which are actually sought after and valued at a realistic, behavioral level). Secondly, behavioral research will be used to answer such questions as: how do you produce a desired behavior pattern? How do you discourage the development of undesirable behavior patterns? Et cetera. The development of experimental models or systems will, in short, be based upon behavioral experimentation.

D. Measurements:

As indicated above, evaluation instruments will need to be available at the stage of testing theoretical systems designed to produce a given pattern of behavior. The kinds and numbers of said instruments will vary according to the goals selected for experimentation and finances available. In any case, the proposed "measurement handbook" will provide valuable input for this process.

E. When:

1. Immediate (one year)

   a. Analysis and clarification of educational objectives.

   b. Substantial progress toward the translation of objectives into specific descriptions of expected behavior.

   c. Substantial communication with educators, scholars, and laymen by means of conferences, television, and other means, to provide input for a and b above, and to create an awareness of the importance of a systematic approach to education.

d. Preliminary observation and small scale experimentation designed to serve as background for later projects and to provide input for a and b above.

e. Production of small products (handbooks, for example) which appear to meet an immediate goal-related need and which can be utilized as devices for testing communication methods and the relative effects of different kinds of communication upon implementaion.

2. Intermediate (five years)

a. Translation of objectives into behavioral terms capable of being subjected to evaluation procedures.

b. Continuing evaluation of objectives, so as to maintain agreement with actual patterns of social change.

c. Continuing communication as in c above.

d. Selection of highest priority educational objectives for experimentation; selection of target populations as determined by objectives and regional need; establishment of systems or models to be tested; carrying out of testing in regard to highest priority objective or objectives.

e. Continuing observation and field study of goal-related programs being carried out in the region by other agencies.

3. Long Range (ten years)

a. Continuing evaluation of objectives, so as to maintain agreement with actual patterns of social changes.

b. Continuing communication with emphasis upon the dissemination of knowledge derived from d and e above.

c. Continued experimentation with systems or models designed to produce or enhance goal-oriented behavior, with emphasis upon high priority goals, not experimented with in the five-year program.

d. Continuing observation and field study, as in c above.

e. Reevaluation of experimental results obtained in 2-d above based upon long-term post-experimental observation of subject behavior and upon changing socio-cultural dimensions.

IV. PRESENT STATE OF AFFAIRS

Much of the preliminary work of the Laboratory can serve as a foundation for the realization of this mission. More specifically, the project work now progressing and proposed should facilitate immediate objectives. The measurement handbook, communications research (with teachers and in general), the television series, and the handbooks on target groups, to mention a few specifics, should provide information of value for this mission. On the other hand, the schedule (above) assumes this contribution and will not be shortened by means of these projects.

V. TASKS TO BE DONE

A. <u>General Identification</u>:

1. Research of the pertinent literature of education, the behavioral disciplines, and lay sources.
2. Synthesis of the above.
3. Expert input secured through group and individual consultative procedures.
4. Lay input secured as feedback to communication procedures, and from conferences.

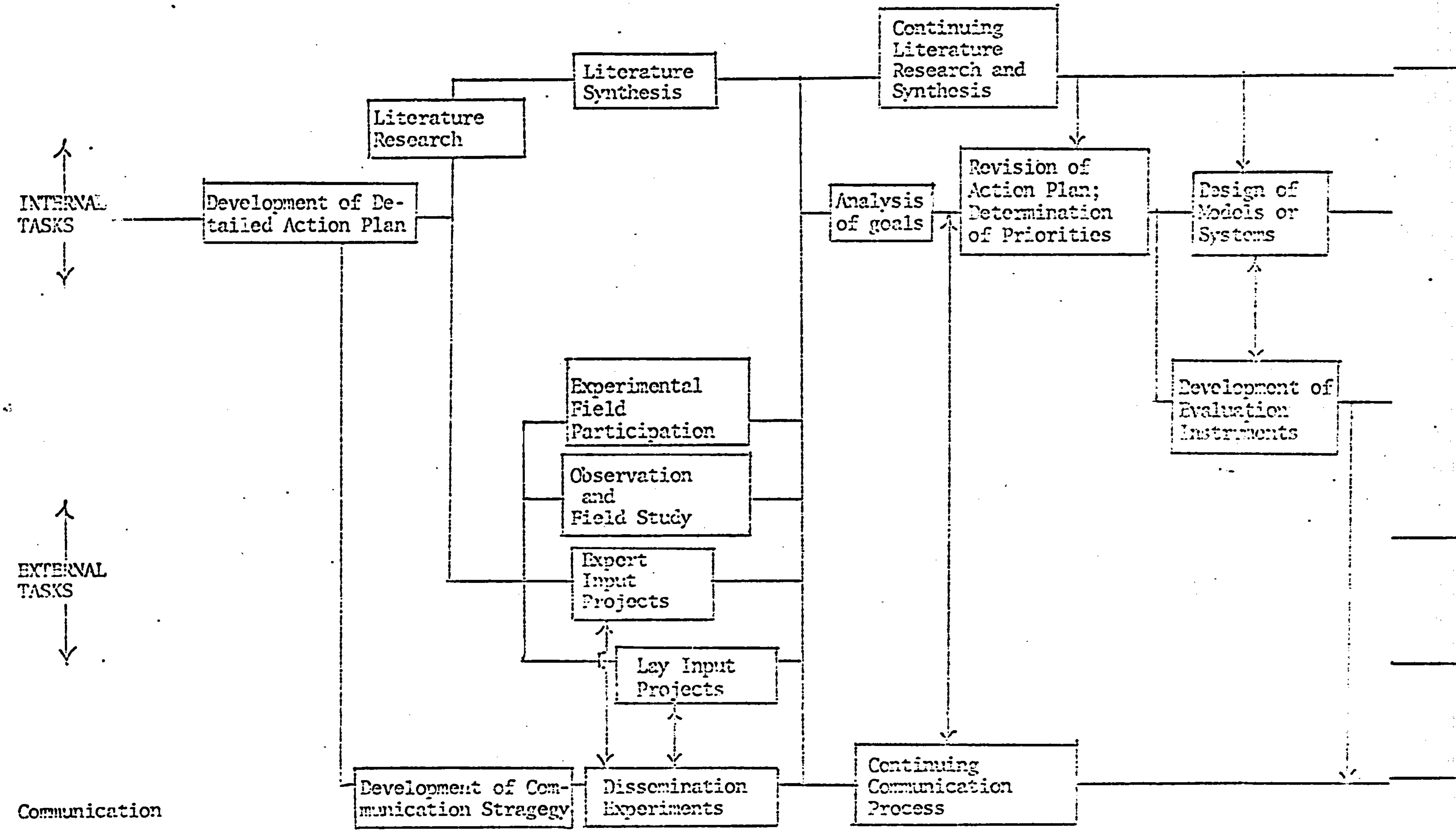
5. Observation and field study projects designed to supplement the above in yielding realistic assessment of actual behavioral goals.
6. Observation and/or field participation in extra-laboratory experimental projects, to provide additional knowledge relevant to objectives and objective-achieving programs.
7. Analysis of objectives so as to yield descriptions of behavior capable of being tested with evaluation instruments.
8. Development of communications procedures designed to yield the most effective kinds of results.
9. Communicating information regarding educational objectives and goal-inducing programs.
10. Development of evaluation instruments as needed.
11. Design and development of models or systems designed to induce desired pattern of behavior.
12. Experimentation with, and testing of, the above.
13. Observational post-experimental activities providing continuing assessment of the results of 12.

VI. SUMMARY

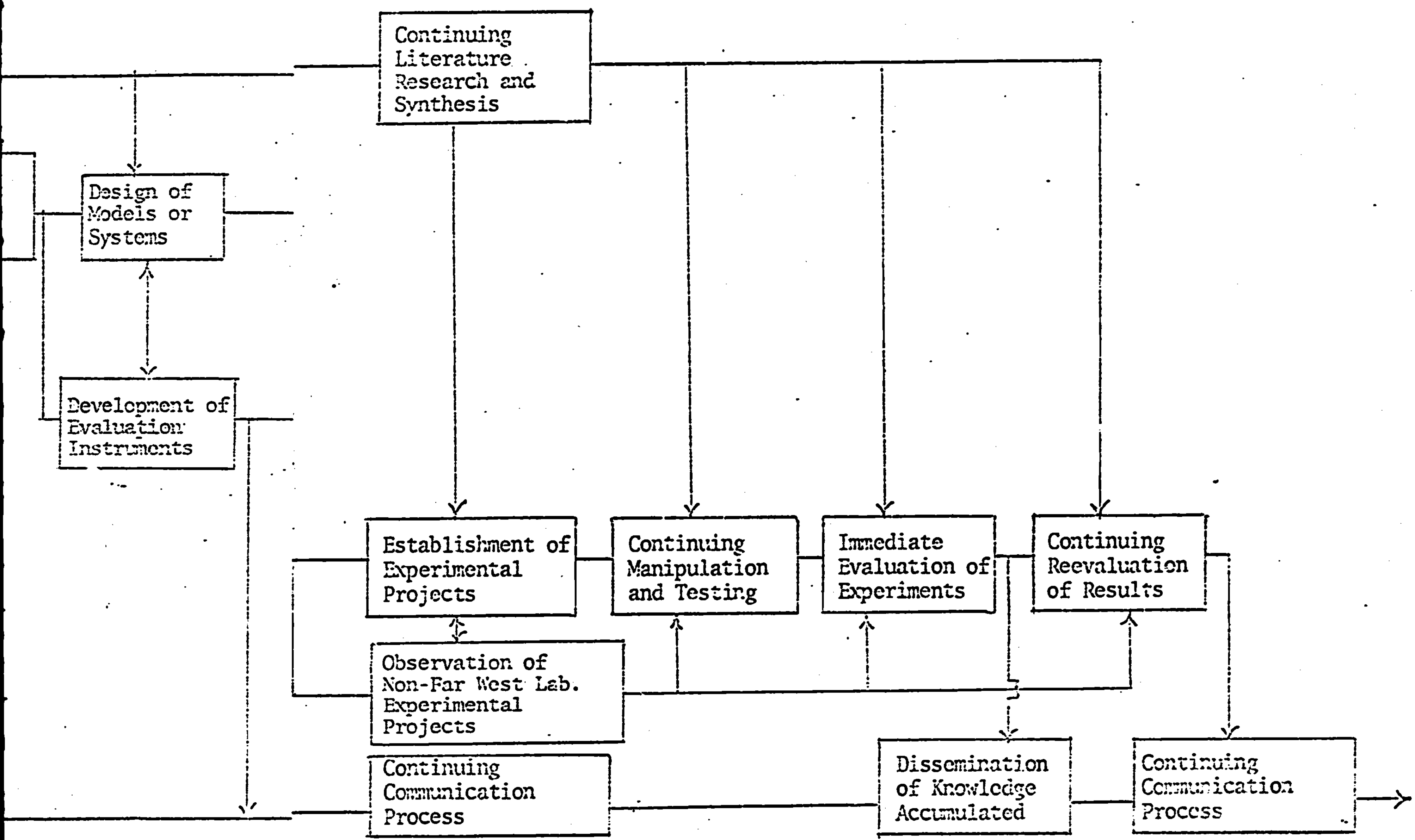
It is herein proposed that the mission of this Laboratory should consist in providing a kind of fundamental leadership which does not now exist in our region. It is also suggested that until this leadership is provided the Laboratory will not be able to implement its specific programmatic interests in the most successful manner.

The implication is also made that we cannot accept the given school situation, or existing innovations made within that context, as necessarily worthy of preservation or "doctoring". The "breakdowns" in affluent modern society, coupled with the obvious needs of minority groups and the poor, serve to indicate that we need to discard old assumptions and take a fundamental look at what it is we, as a society, expect to achieve through the educational process. And after deciding what it is that we want, then we will have to proceed to develop the tools which will yield meaningful results.

The Laboratory cannot, of course, decide for the region what educational goals should be. Ultimately, the society at large will make that determination. However, the Laboratory can facilitate the process and provide "models" which society may adopt or modify, as the case may be.



First Five-Year Flow Chart


Continuing Literature Research and Synthesis
Design of Models or Systems
Development of Evaluation Instruments
Establishment of Experimental Projects
Continuing Manipulation and Testing
Immediate Evaluation of Experiments
Continuing Reevaluation of Results
Observation of Non-Far West Lab. Experimental Projects
Continuing Communication Process
Dissemination of Knowledge Accumulated
Continuing Communication Process

MISSION STATEMENT

COMMUNICATION

I. BACKGROUND

A. History of the Problem

Schools are being expected to assume new responsibilities, which if met will require that school personnel effectively make complex and difficult decisions about changes in their professional activities. Pressures for change in present modes of organization and operation of schools stem from (1) increases in numbers of students, (2) expanded goals and purposes of education and (3) clearer recognition as our society becomes more complex of the importance of extended education of all citizens for the political, social and economic welfare of the nation. Possibilities for changes have increased too, as a direct result of greater investments in educational research and development. At present a clearly recognized impediment to promt and orderly changes is the fact that school personnel, by and large, are poorly informed about various options that could be available to them as they make decisions about how schools are to be organized and operated.

B. General Statement of a Problem

There is a clear need to begin without delay the general tasks associated with increasing the ability of school personnel to make effective decisions that involve changes in their activities by: (1) developing strong motivation among school personnel to be informed about new possibilities of meeting new responsibilities, (2) providing an efficient system through which school personnel can have ready access to relevant information, (3) developing organizational arrangements through which schools can utilize information effectively. It is important to distinguish between providing information about options as decisions are being made and influencing the decisions that are made. It does not follow that to know about a new educational practice is to decide to adopt it. Rational processes of decision making may lead to the outcome of rejecting a possible innovation or change in favor of continuation of a practice presently in use. As a consequence, the measure of effective use of information is not the rate of adoption or change, but the degree to which decisions are made with due regard for the implication of all information that can be made available.

C. Relationship to Laboratory Program Area

A focus of the Laboratory's activities on problems of providing information to school personnel would be responsive to a major need identified in the region during the developmental phase of the Far West Laboratory for Educational Research and Development. In essence it would be a continuation (or elaboration) or one of the five basic programs described in the Initial Plan - the Communication and Information Program. Basic work has been initiated already in this program area through a contract with the Lockheed Missile and Space Company. Our recent decision to meet an urgent need for recognition in the region of the Laboratory and its functions through the production of a series of ETV programs is also relevant.

Dissemination of information about new possibilities for improving educational practices is a clearly assigned general responsibility of the regional laboratories (Title IV Public Law 89-10). Early experience of the laboratories, however, makes it evident that this responsibility will not be met easily. Distribution of newsletters and brochures, reinterpreting technical research reports, conducting special conferences or institutes, consultation with qualified experts, implementation of ERIC, demonstration of exemplary programs, use of mass media, etc., although perhaps necessary components of an effective system of dissemination have not been combined and applied to produce desired results. The problem is to develop a strategy and bring into being a system that will insure that school personnel, at the time they make decisions about methods of instruction, curriculum, school organization, etc. have the best available information about all reasonable options that they might consider.

II. A GENERAL STATEMENT OF MISSION

A. The Mission

The proposed focus of Laboratory activities can be identified more precisely by the following statement of a general mission: "A proposed mission of this Laboratory is to conduct those research, developmental, and operational tasks that will bring into existence effective use of information about options available to school personnel as they make decisions in the organization and operation of schools." Final accomplishment of this mission would bring about a state of affairs in which all known alternatives are recognized and evaluated upon the basis of all available evidence as each educational decision is made in the operation of schools. This is a description of an ideal state, not one which is likely to be attained completely, but one which establishes the desired direction of improvement.

B. Relationship to Missions of Other Organizations

This mission is not likely to be of a unique interest to the Far West Laboratory for Educational Research and Development since it is an attack upon an area of problems confronting all regional laboratories and one with which each by necessity, if not by choice will be concerned. Furthermore, regional laboratories are not alone among the educational institutions that will seek solutions to these problems since they pervade the general concerns which form a large part of the present thrust toward school improvements. However, a sharply focused mission on communication of information in the context of educational decision making may represent a new approach to a general problem.

III. SPECIFIC STATE OF AFFAIRS TO BE REALIZED

A. Immediate Goals

The immediate goals to be achieved are as follows:

1. Develop among school personnel a strong positive attitude in support of continuation and enlargement of investments in educational research and development. Specific goals to be achieved are those attitudes that could be measured with an attitude survey of school personnel which are expressed as a readiness on the part of the majority to allocate resources to educational research and development in an amount at least equal to that which has generally been found desirable by forward looking industry, i.e. from 5 to 10 per cent of the total national educational budget.
2. Develop among school personnel a knowledge of educational research and development which supports realistic expectations from research and development. Specifically we would seek to give school personnel the ability to estimate the advantages, disadvantages, benefits and costs of possible innovations in a manner consistent with such estimates if they were made by persons most knowledgeable and experiences in the area of innovation. School

personnel should neither be overly optimistic or pessimistic about the possibilities inherent in an innovation, nor should they be overly concerned about the effects of a change upon their role within the school.

3. Develop a climate within school supportive of the full participation of school personnel in educational research and development. Specifically, educational research workers should be able to find ready acceptance to any reasonable request for participation of schools in the work necessary to develop and evaluate a new idea.

These three objectives represent the immediate goals of the mission. We should be able to measure definite gains in their direction within one year and to have substantially achieved them in three years.

B. Intermediate Goals

Within five years we should be able to specify and have made significant progress toward the attainment of goals relative to an effective system for the development, storage, retrieval and display of the information most needed by school personnel. By that time we can anticipate that such information will have increased vastly in volume and kind as a consequence of expansion of research and development activities.

C. Long Range Goals

Within the long run of approximately ten years our goals will include establishing effective organizational arrangements within schools whereby the vastly larger amount of information available to school personnel is being used effectively.

IV. PRESENT STATE OF AFFAIRS

It is expected that the work now underway with the assistance of the Lockheed Missile and Space Company will provide within six months a well documented and detailed analysis of the present state of affairs in the area of the mission. Generally, the results of Phase I of the Lockheed Study support an early assessment of the present state of affairs as one needing vast improvement. School personnel are confused and dissatisfied with their present information or lack of it about educational research and development. Efforts known by them to be underway to improve the situation are not looked upon as very promising.

V. TASKS TO BE DONE

The tasks to be accomplished under the guidance of the proposed mission can be organized within its three major components: (1) development of attitudes and expectations, (2) creation of a system for production, storage retrieval and display of information and (3) establishment of organization arrangement within schools to utilize information effectively.

A. Tasks associated with development of attitudes and expectations.

These tasks need to be initiated ahead of others since if they are effective in accomplishing their objectives, the performance of other tasks of the mission will be less difficult.

Task A-1 (Spring 1967) - Develop and distribute for viewing by classroom teachers (ETV, videotapes, or film) a series of 30 minute programs designed to show the excitement of educational research and development.

Task A-2 (Spring 1967) - Develop and distribute specific "Communication" products based on past research and development in education. The products will be made available with the distribution of the series of programs. They might include for example:

(a) Booklets describing for teachers the educational characteristics of students with minority cultural backgrounds.

(b) A guide to the use of a roster of educational consultants available to schools in the region.

(c) Conference reports produced by the Laboratory.

Task A-3 (Spring and Summer 1967) - Design and conduct a survey to determine the impact of the series of programs and products and to determine the discrepancy between results achieved and desired goals.

Task A-4 (Summer and Fall 1967) - Revise plans, develop and distribute a second series of programs and products (or develop an alternative approach if this be indicated).

Task A-5 (Winter 1967) - Survey attitudes to determine the impact of the revised program and products.

Task A-6 (1968) - Evaluate discrepancies between results achieved and desired attitudinal goals. Continue to cycle through D, E and F until the objectives specified for this part of the mission are achieved.

Task A-7 (1969) - Design and install as a part of Laboratory operations a series of programs that maintains the attitudinal objectives that have been reached.

B. Tasks associated with creation of a system for the production, storage, retrieval and display of information. These tasks can not be specified well at this time and should not anticipate the outcomes of the Lockheed study; however, they can be identified in general terms.

Task B-1 - The first task to be completed is the study now underway through contract with Lockheed. This study will produce design information for a suitable system (Fall 1967).

Task B-2 - Plan Stage I of the development of an information system upon the basis of the report of Phase II of the Lockheed Study (Winter 1967).

Task B-3 - Implement Stage I of the information system within a small number of schools on a pilot basis (1968).

Task B-4 - Determine the effectiveness of the Stage I system in the pilot schools (Spring 1969).

Task B-5 - Revise and extend Stage 1 system to cover all schools in the region (1969-1970).

Task B-6 - Plan Stage II information system on basis of evaluation of Stage I pilot program and a review of design possibilities (1969).

Task B-7 - Implement Stage II system in a small number of pilot schools (1970).

Task B-8 - Determine the effectiveness of Stage II system (1971).

Task B-9 - Replace Stage I system with Stage II system in schools of the region (1972-1973).

C. Tasks associated with creating within the school an organizational arrangement to provide a capability to utilize information effectively. The process of change has been subjected to much analysis and research during the past ten to twenty years. We have developed some information about the problems of changing an organization's pattern of activities, and future research is likely to add to our understanding of this complex process. It appears reasonably well established that organization change is not a process that must happen incidentally or "naturally", but one that can be encouraged, directed, and facilitated. The task in this area will be planned to take advantage of information anticipated to be a result of research and development conducted elsewhere and to create within each school an arrangement within the school organization to facilitate the effective use of information derived from educational research and development.

Task C-1 - Review and study of the present state of knowledge in the general area of "educational change" and of the promise of projects in the area now underway and select, modify, and/or develop three of the more promising approaches for testing (Fall 1967).

Task C-2 - Introduce each of the three "approaches" experimentally within pilot schools in the region. (1968).

Task C-3 - Evaluate the effectiveness of each of the "approaches" and select one for intensive development (1969).

Task C-4 - Implement the "approach" selected and developed in pilot schools of the region (1970).

Task C-5 - Determine the effectiveness of the "approach" and revised as indicated (Spring-Summer 1971).

Task C-6 - Integrate Stage I of the information system with the revised "approach" in pilot schools (1971).

Task C-7 - Determine the effectiveness of the integrated system (Fall 1971).

Task C-8 - Revise and extend the integrated system to cover schools in the region (1972-1973).

Task C-9 - Revise integrated system to accomodate Stage II of the information system (1973-1974).

Task C-10 - Evaluate the total system and make necessary revisions (1975).

Task C-11 - Provide procedures for constant monitoring, up-dating and maintenance of the system (1976).

TIME, TASK, TALENT ANALYSIS OF COMMUNICATION MISSION

TIME: 1967, 1968, 1969, 1970, 1971, 1972, 1973, 1974, 1975, 1977

TASKS	TYPES OF PERSONNEL: LABORATORY	SCHOOLS	CONTRACT	CONSULTANTS
COMPONENT A				
A-1: Develop and distribute 10 ETV programs for viewing by classroom teachers in region.	*		*	
A-2: Develop and distribute a series of "Communications" products.	*			
A-3: Determine impact of ETV programs & "Communications" products on attitudes of school personnel.			*	
A-4: Revise plans, develop and distribute a second series of programs and products.	*		*	
A-5: Determine impact of second series of programs and products.	*			
A-6: Evaluate discrepancies between results achieved and desired attitudinal goals (continue to cycle through A-4, A-5, A-6 until goals are reached.)	*		*	*
A-7: Design, and install as a part of Laboratory operations, a series of programs that maintain attitudinal objectives.	*	*		
COMPONENT B				
B-1: Complete Phase II of Lockheed Communication and Utilization study.			*	
B-2: Plan Stage I of an information system.			*	*
B-3: Implement Stage I within a small number of pilot schools.	*	*		
B-4: Determine effectiveness of Stage I information system.	*			
B-5: Revise and extend Stage I system to cover all schools in region.	*	*		
B-6: Plan Stage II of an information system.	*		*	*
B-7: Implement Stage II of system in a small number of pilot schools.	*	*		
B-8: Determine effectiveness of Stage II information system.	*			
B-9: Replace Stage I system with Stage II system in all schools in region.	*	*		
COMPONENT C				
C-1: Review state of art in "educational change" and select 3 promising approaches for trial.	*			
C-2: Introduce each of the 3 approaches experimentally within pilot schools.	*	*		*
C-3: Evaluate relative effectiveness of each approach and select one for intensive development.	*			
C-4: Implement approach selected in C-3 in pilot schools in region.	*	*		*
C-5: Determine effectiveness of approach and revise to improve.	*			
C-6: Integrate Stage I of information system and revised approach to change in pilot schools.	*	*	*	
C-7: Determine effectiveness of integrated system.	*			
C-8: Revise and extend integrated system to all schools in region.	*	*		
C-9: Revise integrated system to accommodate Stage II of information system.	*	*		
C-10: Evaluate total system and make necessary revisions.	*			*
C-11: Provide procedures for monitoring, up-dating, and maintaining system.	*		*	

LABORATORY MISSION COMPARISON SCALE

Criteria for evaluating a mission

The laboratory missions may be defined as the ultimate long range tasks that the laboratory has set out to achieve. As such they must point the direction for the programs and projects of the laboratory and provide the yardsticks by which to measure their pertinence. They are of basic important since the ultimate impact of the laboratory on education can be no more significant than the missions it adopts.

In thinking of laboratory missions, the question of criteria inevitably arises. How does one choose among missions? How can one decide upon the right combination of importance, practicality and attainability? The following criteria which have emerged in program staff discussions, provide a partial answer to these questions.

PART I

Instructions

This part of the scale permits you to evaluate each mission on fourteen criteria. These evaluations are to be made on a 5 point scale in which descriptions have been prepared for the high, middle and low points. The two intermediate points (points 2 and 4) are to be used when in your judgment the mission that you are evaluating would best be described by a statement intermediate between two of the prepared statements. For each of the fourteen criteria place a check mark in front of the scale point that best reflects your evaluation of the mission under consideration. It will be necessary to complete this part of the scale for each of the six missions. It is suggested that you use the following procedures in completing these evaluations:

1. Review the fourteen criteria given in this scale so as to help focus your attention while reading the mission.

2. Select one of the mission statements, read and reread it carefully.

3. Find the rating form that has as its heading the name of the mission you have just read. The rating forms for the six missions are placed in alphabetical order: Assessment, Change, Communication, Goals, Interation, and Teacher Education.

4. Make your evaluation of the mission you have just read on the fourteen criteria given in the rating form.

5. Repeat steps one through four until you have evaluated all six of the proposed missions. Then go on to Part II of the scale.

A S S E S S M E N T

1. IMPORTANCE - AN APPROPRIATE MISSION SHOULD HOLD A PROMISE OF MEETING AN IMPORTANT EDUCATIONAL NEED OF THE REGION.

_____ 5 This mission is addressed to a major need where current practice is known to be weak.
_____ 4
_____ 3 Is addressed to a need where some specific deficiencies are known to exist.
_____ 2
_____ 1 Is addressed to a need where current practices are satisfactory, but could be improved.

2. FOCUS - AN APPROPRIATE MISSION SHOULD HAVE A CLEARLY DEFINED FOCUS.

_____ 5 This mission proposes to produce a specific, clearly described end product.
_____ 4
_____ 3 Describes a class of end products in moderately specific terms.
_____ 2
_____ 1 Has a rather broad focus that is not very clear as this point.

3. BREADTH OF TASKS - AN APPROPRIATE MISSION SHOULD BE BROAD ENOUGH TO INCLUDE SEVERAL LEVELS OF TASKS RANGING FROM DIRECT SERVICE AT THE CLASSROOM LEVEL TO TESTING SIGNIFICANT THEORETICAL CONSTRUCTS AT THE NATIONAL LEVEL.

_____ 5 This mission would include significant tasks at several levels.
_____ 4
_____ 3 Permits some breadth, but would fall far short of reaching from the classroom to the national level.
_____ 2
_____ 1 Nearly all tasks would be directed at a single level.

4. PAY OFF - AN APPROPRIATE MISSION SHOULD HAVE SUFFICIENT OUTPUT TO SUSTAIN ITS OWN MOMENTUM, i.e. SHOULD PROVIDE SIGNIFICANT SHORT TERM AND INTERMEDIATE AS WELL AS LONG TERM PAYOFFS.

_____ 5 This mission will probably produce significant payoffs regularly throughout the life of the Laboratory.
_____ 4
_____ 3 Shows little chance of producing significant payoffs during at least one phase, i.e. may have good long term possibilities but poor short term possibilities or vice versa.
_____ 2
_____ 1 Will probably not produce significant payoffs at any of the 3 phases.

5. FEEDBACK - AN APPROPRIATE MISSION SHOULD PERMIT THE DEVELOPMENT OF SELF EVALUATIVE AND CORRECTIVE FEEDBACK PROCEDURES.

_____ 5 This mission permits frequent corrective feedback procedures. They are built in or could easily be built in.
_____ 4
_____ 3 Offers limited possibilities for self evaluation and corrective feedback.
_____ 2
_____ 1 Does not lend itself to corrective feedback. Little or none would be possible.

6. COMPATIBILITY WITH RESOURCES - AN APPROPRIATE MISSION SHOULD BE WELL SUITED TO THE REGIONAL EDUCATIONAL CLIMATE, THE REGIONAL RESOURCES AND THE TALENTS OF THE LABORATORY STAFF.

_____ 5 This mission is very well suited to the regional resources and the talents of the laboratory staff.
_____ 4
_____ 3 Does not fit regional and/or staff resources very well, but could be carried out.
_____ 2
_____ 1 Fits with regional and/or staff resources poorly enough to make successful execution doubtful.

7. ORGANIZATIONAL INVOLVEMENT - AN APPROPRIATE MISSION SHOULD PERMIT A COOPERATIVE EFFORT WITH OTHER EDUCATIONAL ORGANIZATIONS IN THE REGION.

_____ 5 A close partnership with several significant organizations in the region would probably emerge.
_____ 4
_____ 3 Mission would permit moderate involvement of one or more other educational organizations.
_____ 2
_____ 1 Little or no significant cooperative effort would be likely to develop.

8. FUNDAMENTAL PROBLEM ORIENTATION - AN APPROPRIATE MISSION SHOULD DEAL WITH A MAJOR EDUCATIONAL PROBLEM.

_____ 5 This mission deals with a problem that has major implications for the total educational role of society.
_____ 4
_____ 3 Deals with a problem that would have impact on a major sector of education.
_____ 2
_____ 1 Deals with a problem that would have few significant implications.

9. DUPLICATION - AN APPROPRIATE MISSION DOES NOT DUPLICATE UNNECESSARILY THE EFFORT OF ANY OTHER MAJOR RESEARCH AND DEVELOPMENT ORGANIZATION.

_____ 5 This mission centers effort in an area where virtually nothing is now being accomplished.
_____ 4
_____ 3 Relates to but does not duplicate other significant efforts.
_____ 2
_____ 1 Duplicates other work to a degree that suggests our effort would be largely wasted.

10. FUNDING FEASIBILITY - AN APPROPRIATE MISSION SHOULD MAKE A SIGNIFICANT IMPACT ON EDUCATION WITHIN THE PROBABLE ANNUAL BUDGET OF THE LABORATORY (one to two million dollars).

_____ 5 This mission is very likely to produce a major impact within our budget limitations.
_____ 4
_____ 3 It is doubtful if a significant impact can be made within our probable budget.
_____ 2
_____ 1 There is almost no chance of making a significant impact within our probable budget.

11. BREADTH OF APPLICATION - AN APPROPRIATE MISSION SHOULD HAVE IMPLICATIONS ACROSS A REASONABLY BROAD EDUCATIONAL RANGE, i.e. SHOULD NOT BE LIMITED TO A SINGLE GRADE LEVEL, A SINGLE CURRICULUM OR A SINGLE TYPE OF PUPIL.

_____ 5 This mission will have implications across the total range of education.
_____ 4
_____ 3 Implications for many educational programs, for different curriculum areas, and at different grade levels.
_____ 2
_____ 1 Implications that are confined to narrow educational boundaries.

12. POLITICAL FEASIBILITY - AN APPROPRIATE MISSION SHOULD BE POLITICALLY FEASIBLE.

_____ 5 This mission is not likely to conflict with the interests of powerful or special interest groups or generate significant or widespread opposition.
_____ 4
_____ 3 Might step on a few toes but not to a degree that would be likely to restrict seriously the Laboratory's effectiveness.
_____ 2
_____ 1 Is a political "hot potato".

13. BALANCE OF TASKS - AN APPROPRIATE MISSION SHOULD PERMIT A BALANCE AMONG THE VARIOUS STEPS IN THE RESEARCH TO IMPLEMENTATION CONTINUUM THAT IS APPROPRIATE FOR A REGIONAL LABORATORY.

_____ 5 There is a reasonable balance among research, development, demonstration and diffusion efforts.

_____ 4

_____ 3 One or two steps in the research to implementation continuum would take a disproportionate amount of the Laboratory effort.

_____ 2

_____ 1 Tasks are centered almost entirely in one of two areas such as research-development or diffusion-implementation.

14. RISK - AN APPROPRIATE MISSION INVOLVES A MINIMUM RISK OF FAILURE OF ACHIEVEMENT OF PLANNED OBJECTIVES.

_____ 5 The chances of achieving the planned objectives appear to be excellent.

_____ 4

_____ 3 Such things as current knowledge limitations or difficult intermediate tasks introduce a significant risk that the planned objectives will not be reached.

_____ 2

_____ 1 There seems little chance of making significant progress towards the planned objectives.

C H A N G E

1. IMPORTANCE - AN APPROPRIATE MISSION SHOULD HOLD A PROMISE OF MEETING AN IMPORTANT EDUCATIONAL NEED OF THE REGION.

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_____ 5 This mission would include significant tasks at several levels.
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GOALS

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PART II

Overall ranking of the six missions:

Since there is no reason to believe that the fourteen criteria listed are equally important, nor is it likely that complete agreement could be obtained on their relative importance, it is possible for a mission to obtain the highest total score on these criteria in Part I and yet not be considered by the rater to be generally the most desirable mission for the Laboratory to adopt. This section of the form gives you an opportunity to make a global evaluation of the six missions and rank them in order of preference. Two rankings are called for. First, rank the missions in the order you would prefer them for the primary mission of the Laboratory. To do this, write a number one (1) in front of the mission you believe would be most desirable as the primary mission, a two (2) in front of the mission you consider second most desirable and so on until all six missions have been ranked. Then go on and repeat the process indicating your preference for the six missions as the secondary mission of the Laboratory.

Rankings for Primary Mission

_____ Assessment

_____ Change

_____ Communication

_____ Goals

_____ Interaction

_____ Teacher Education

Rankings for Secondary Mission

_____ Assessment

_____ Change

_____ Communication

_____ Goals

_____ Interaction

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SUPPORT FILE

Products

Prospectus for the Establishment in 1966 of a Northern California Education Laboratory under Title IV, Public Law 89-10, October 14, 1956

Progress Report, March 31, 1966

Abstract of Progress Report, March 31, 1966

Technical Progress Report, April 30, 1966

Initial Plan, June 15, 1966

First Annual Report, September 15, 1966

Proceedings: Conference on Instructional Methods & Teacher Behavior November 21, 1966

Communication and Utilization Study for Educational Research and Development, Phase I (Lockheed Missiles & Space Company) November 30, 1966

Proceedings: Conference on Inservice Education, December 1-2, 1966

Program Documents

Formulating Educational Problems, Feburary, 1967

TV Program Listing, Spring, 1967

Program Plans, March 1, 1967

Report of Advisory Council, March 28, 1967

Programs - 10 Answers, May, 1967

Mexican-Americans: A Handbook for Educators, 1967

Draft of A Handbook for the Assessment and Measurement of Educational Outcomes (first seven sections) 1967

Memoranda for the Board of Directors, September, 1966 - August, 1967

Products (continued)

Kinescopes:
a) "I Don't Get How That Happens"
b) "A Good Start for Learning"
c) "Micro-Teaching"
d) "Each One is Different"
e) "All Working Together"

Documents

Joint Powers Agreement, 1966

Amendment to Joint Powers Agreement, November 22, 1966

Subcontract with Lockheed Missiles & Space Company, September 30, 1966

Subcontract with American Institutes for Research, Problem Formulation, January 15, 1967

Subcontract with KQED

Subcontract with Stanford Research Institute

Employee Handbook

Business Office Manual

National Science Foundation Proposal, March 20, 1967

Minutes of Meetings: Board of Directors, Executive Panel, Administrative Committee

Professional Staff Biographies