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ABSTRACT

In 1970 the National Center for Educational Research and Development (CER) reviewed United States Office of Education (USOE) Bureau of Research policies over the previous 15 years, and as a result of this review, initiated the Directed Research Program. This program will concentrate funds in four areas of high educational significance and will be conducted so that cumulative results can be employed relatively soon to improve the schools: (1) Reading, (2) Early Childhood, (3) Vocational Education, and (4) School Organization and Administration. In this document, development plans for each of these four areas are profiled against a timetable spanning fiscal years 1971-1976 with possible cost allocations per activity per year. Problems, objectives, and strategies for development of activities are described and major problem areas within activities are delineated. Research which concentrates on disadvantaged populations, which is linked to other USOE programs, which can be disseminated to the schools, and which can be implemented in experimental schools or regional educational laboratories will offer maximal return for the investment of resources. (WY)

DIRECTED RESEARCH PROGRAM

in

Reading
Early Childhood
Vocational Education
School Organization and Administration

FY 72 - FY 76

NATIONAL CENTER FOR EDUCATIONAL RESEARCH AND DEVELOPMENT

U. S. Office of Education

Planning in progress: May, 1970

Organizations and individuals interested in this program are invited to submit their reactions and suggestions in order to advance the planning process.

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DIRECTED RESEARCH PROGRAM
of the
NATIONAL CENTER FOR EDUCATIONAL RESEARCH AND DEVELOPMENT

U. S. Office of Education

For 15 years the USOE Bureau of Research pursued a policy of responding to research and development initiatives from universities, schools, and other agencies. Taking its cue from the original Cooperative Research Act of 1954, the Bureau operated on the assumption that individual and collective professional wisdom would be best expressed and the cause of education best advanced if research and development were proposed from sources outside the U. S. Office of Education, with the Bureau limiting itself to the approval or disapproval of the proposals.

There were a few significant exceptions. From time to time the Bureau exerted strong initiative, as when it moved to create the university-based Research and Development Centers and the Regional Educational Laboratories. These research and development instrumentalities were left, however, to choose the substantative problems on which they would work, with the Bureau once again limiting its role largely to approving or disapproving what was proposed.

Creation of the Center for Educational Research (CER)

The first major break from this policy occurred with the creation of the National Center for Educational Research and Development (CER) in FY 70. CER replaced the Bureau. Its first major act was to review the effect of Bureau policies on the conduct of research and development in education over the previous 15 years. The following things became evident (none of them for the first time):

1. The education profession is almost entirely dependent upon the U. S. Office of Education for the support of research and development, except for the limited accomplishments possible through doctoral research, a part of which is itself financed through USOE. Other federal sources, state sources, and private sources are so limited that virtually the entire enterprise is being carried by the USOE research program.

2. The amount of money devoted to the effort is far too small for the changes being demanded of the schools. It is quite impossible to rejuvenate and redirect the enormous nationwide enterprise with a research and development budget of less than $100 million.

3. The Bureau had no administrative device for directing funds into areas of critical educational need. While the diverse interests of professionals in the field did in fact encompass virtually

every educational problem, the very diversity of those interests meant that field-initiated research and development attended to everything and concentrated on nothing. The effort to stretch limited resources over the entire territory of professional interest led to thinness of coverage.

4. The work of the previous 15 years tended to be non-cumulative, except within the careers of individual researchers and within the programs of individual R & D Centers and Regional Educational Laboratories. The Bureau had not been able to accumulate and synthesize a substantial amount of research on a single problem so as to shed light on its solution.

5. Fifteen years of unsolicited, field-initiated research and development had not created a strong, vocal constituency for educational research and development--either within the research community itself, or within the universities where most researchers hold their appointments, or within local school systems or state education departments, or within the circles of the federal government.

Having completed its review, CER decided to initiate the Directed Research Program.

Initiation of Directed Research Program

The new program will concentrate funds in a few areas of high educational significance, limit spending to a few soluble problems, manage the program so that the results will be cumulative and can be employed relatively soon to improve the schools, and attempt to build wide recognition of the power of properly-supported research and development to change the schools.

About 85% of CER resources which are not earmarked for such special purposes as National Assessment will go into Directed Research. This severe concentration of limited resources, without which CER cannot achieve its specific objectives, will of course reduce the size of the unsolicited research program.

The Four Areas of Directed Research

The new program will be limited to four aspects of education where excellence is essential yet where problems are serious and growing:

1) Reading. Every aspect of the reading process, from learning to read to lifelong improvement in reading, is included.

2) Early Childhood. The education of children in the critical years of intellectual development, ages 3 through 8, is the domain. Cognitive development, intellectual skills, and achievement attitudes are the focus.

3) Vocational Education. The high school and post-high-school years are the territory, with special attention to new curricula for emerging occupations.

4) School Organization and Administration. The organization and management of elementary and secondary schools and their proper relation to other educational organizations is the concern.

Concentration on Disadvantaged Populations

USOE continues its deep concern for providing better education to disadvantaged children and youth. Thus CER has singled out this target population for concentrated attention throughout the Directed Research Program. The selection of that target population will become evident in the specific program descriptions. Understandably, the choice is clearer and more appropriate in the reading, early childhood, and vocational education sectors than in the organization and administration effort.

Linking Directed Research to Other USOE Programs

An entirely new opportunity has emerged with the launching of the Directed Research Program, a possibility which did not exist under the field-initiated program of earlier years. This is the opportunity for connecting the research and development work of USOE with its other programs.

The work of the Bureau of Elementary and Secondary Education in educating the disadvantaged under ESEA Title I and promoting innovation under ESEA Title III, the priority training programs of the Bureau of Educational Personnel Development, the support programs of the Bureau of Vocational Education, and the research, dissemination, and training programs of the Bureau of the Handicapped were only loosely connected with the work of the Bureau of Research. That was understandable when an undirected, unsolicited, field-initiated research and development program, in which the Bureau itself could not anticipate and did not attempt to control the direction beyond seeing that the work supported was of good quality.

In contrast, a Directed Research Program planned and managed by CER allows for linking the work carefully to other USOE programs. In moving its FY 72 detailed planning forward, CER will work with other USOE units so that those units can help CER decide what to achieve in Directed Research. Then when CER products appear, the Office of Information Dissemination can tell schools about what CER has developed, BESE and BAVE can help schools finance it, and BAVE and BEH and BEPD can teach schools how to use it.

Linking Directed Research to the Office of Information Dissemination

USOE has established a new Office of Information Dissemination to attend to the spread of research-based knowledge and improved practice in education. The new Office will manage ERIC but is expected to go well beyond the transmission of information to the more demanding work of transmitting better practice to the schools. Because CER's Directed Research Program will begin its work relatively far "downstream", with the intention of having useful products for the schools rather soon, OID should shortly become a natural working partner for CER. CER will be able to give OID something substantial to disseminate, while OID will represent a significant set of channels for transmitting CER products to the schools.

Moreover, certain priority problems in CER's School Organization and Administration program have to do with designing better communication networks among knowledge-producing and knowledge-using organizations. OID assistance will be sought in designing this endeavor.

Linking Directed Research to Experimental Schools Program

The Experimental Schools Program, for which CER has requested $20 million for FY 71 will give CER's Directed Research Program a superb working partner. CER's major strategy in Directed Research will be to develop solutions to problems where enough research knowledge has accumulated--much of it through past Bureau of Research support--to allow rapid progress. Development requires cooperating field sites in local schools. If the development is successful, it is followed by demonstration, which requires still more field sites. The experimental schools should serve as excellent sites for CER while at the same time CER gives the schools something to experiment with.

Implications for Research and Development Centers and Regional Educational Laboratories

The Bureau of Research invested heavily in the creation of a national system of Research and Development Centers and Regional Educational Laboratories. These agencies were created specifically to increase the nation's capability for performing research and development on critical educational problems. It is now possible to demonstrate the wisdom of this policy and to make the past investment yield full benefits by directing the attention of the Centers and Laboratories to the urgent educational problems identified by CER. Not surprisingly, given their sensitivity to social problems, their closeness to the schools, and the character of their governing boards and professional staffs, most of the Centers and Labs are already at work in the four areas of CER's Directed Research Program. Those which are not will have the choice of shifting their attention to these four areas, turning to USOE non-research programs for support, or seeking funds elsewhere.

CER has solicited and continues to solicit the advice of these maturing organizations in shaping its Directed Research Program. CER expects that the Centers and Labs will want to take a central role in moving the program forward, fully justifying the original USOE expectations that when urgent problems arose, the capabilities of those agencies would prove invaluable.

Foreshadowing the National Institute for Education

As it is presently conceived, the National Institute will operate both directed and unsolicited research and development programs. Moreover, it will conduct part of its work through a resident research and development staff and part of it through non-resident individuals and outside organizations. NIE is expected to have a decided impact on school practice, partly through linking its work to other USOE programs.

CER's Directed Research Program, although none of it will involve a resident staff, is entirely in keeping with the emerging NIE conception. It can be absorbed into NIE at any time without a major change in direction.

Moreover, CER's experience in managing the program and the skills acquired by its staff in doing so can also be absorbed. Both should prove useful to NIE in launching new efforts.

Plans for FY 72 Extend Before and After

CER has developed the Directed Research Program plan for FY 72, when it is expected to be in full operation. However, the planning effort has extended in two directions from FY 72.

First, decisions about the small remaining FY 70 funds have been made in such a way that projects supported fall into the Directed Research priority areas. Second, FY 71 planning has been reshaped to conform to the Directed Research targets wherever possible. Thus CER has already moved to assure that it will arrive where it intends in FY 72.

Moreover, CER has looked into the four years beyond FY 72 and has made estimates of spending levels which will be necessary to carry forward the work begun in FY 72 and earlier. These estimates may need to be modified as the program unfolds.

Budget Estimates for FY 72 - FY 76

Below is a summary of the estimated costs of the work projected in each of the four Directed Research areas for the five-year period FY 72 - FY 76:

In $ Millions

Research Area	1972	1973	1974	1975	1976	5 Year Total
Reading	17.80	13.00	8.45	3.00		42.25
Early Childhood	5.50	10.50	16.50	23.50	27.50	83.50
Vocational Education	9.65	17.91	19.85	18.45		65.86
Organization and Administration	7.00	7.90	9.30	7.00	3.75	34.95
	39.95	49.31	54.10	51.95	31.25	226.06

READING

USOE CER Research and Development Plans for FY 72-76

The reading problem in the United States was set forth by James E. Allen, Jr., U.S. Commissioner of Education, in an address entitled The Right to Read--Target for the 70's, delivered in September, 1969. In this speech, Commissioner Allen noted the following:

> From a variety of statistical information accumulated by the Office of Education regarding reading deficiencies throughout the country, these shocking facts stand out:
>
> --One out of every four students nationwide has significant reading deficiencies.
>
> --In large city school systems, up to half of the students read below expectation.
>
> --There are more than three million illiterates in our adult population.
>
> --About half of the unemployed youth in New York City, ages 16-21, are functionally illiterate.
>
> --Three-quarters of the juvenile offenders in New York City are two or more years retarded in reading.
>
> --In a recent U.S. Armed Forces program called Project 100,000, 68.2 percent of the young men fell below Grade Seven in reading and academic ability.
>
> The tragedy of these statistics is that they represent a barrier to success that for many young adults produces the misery of a life marked by poverty, unemployment, alienation and, in many cases, crime.

Commissioner Allen further proclaimed his belief that

> ...we should immediately set for ourselves the goal of assuring that by the end of the 1970's the right to read shall be a reality for all--that no one shall be leaving our schools without the skill and the desire necessary to read to the full limits of his capability.

The Plan for the National Right to Read Effort

Commissioner Allen immediately initiated efforts to determine what should be done to realize this goal. One of these efforts was an intensive planning session held in February, 1970. This session resulted in the development of A Preliminary Plan for the National Right to Read Effort.

This plan describes and sequences some forty activities to be undertaken during the next ten years. Each activity is designed to contribute to attainment of the goal. It is important to note that the Preliminary Plan prescribes a national program. State and local educational agencies, private industry, and many other public and private organizations must participate along with the U.S. Office of Education if the goal is to be reached.

The National Right to Read Effort obligates the Office of Education to play a major part in the development of its activities. Among the tasks of the Office of Education, some are of a research and development nature. A number of these have been assigned to the National Center for Educational Research and Development (CER) for implementation.

The Role of CER in the Right to Read Effort

Three of the responsibilities given to CER--evaluation and selection of effective reading instruction practices, evaluation and selection of effective existing reading instruction systems and their assembly into comprehensive reading instruction programs, and design and development of effective new reading instruction systems--deal with reading instruction. Their successful attainment may be viewed as successive milestones on the route to the goal.

1. Effective Reading Instruction Practices

Effective reading instruction practices are those procedures--such as use of book fairs, flash cards, diagnostic instruments, etc.--which successful reading teachers use. Unfortunately, many effective practices are now used by only a limited number of teachers, typically those creative practitioners who have developed them. Accordingly, the first responsibility of CER is to identify and evaluate the many scattered reading instruction practices now used, so that those which are effective may be disseminated nationwide. The immediate consequence will be that a certain number of American children who are now failing in reading will begin to succeed.

2. Existing Reading Instruction Systems and Programs

If effective reading instruction practices constitute art, then effective reading instruction systems stand as their scientific counterparts. However, a cluster of successful practices does not necessarily add up to an effective reading instruction system, which, by definition, includes everything needed by a local agency to obtain specified reading instruction outcomes by all the children who enter that system. A reading instruction system, thus, differs from the many forms of reading instruction common in our schools, in that the system will include a specification of instructional outcomes, criterion measures to determine the accomplishment of the outcomes, instruments to diagnose student learning difficulties, and other such system components not now widely used. During this last decade, reading professionals have been attempting to assemble into tightly-coordinated reading instruction systems just those procedures, materials, etc., which will lead to successful reading performance on the part of all children admitted into that particular system.

These professionals have had some success, and there is now a limited consensus among them about the necessary components of an effective system. Even more important, a limited number of such systems now exist or are nearing completion. Accordingly, the second responsibility of CER is to identify and evaluate the existing reading instruction systems. Implementation of these systems will lead to a further increase in the number of children who succeed in reading.

Typically, a reading instruction system is designed to be effective with a specified population--such as Mexican-American children--or in a specified situation--such as a community center staffed by a high proportion of mothers and paraprofessionals. In general, however, local educational agencies are responsible for various mixes of populations and situations. They need, thus, groupings of demonstrably effective reading instruction systems into comprehensive reading instruction programs which will be effective with all mixes of populations or situations for which they are responsible. As a followup to its work on existing reading instruction systems, thus, CER will be asked to assemble and test for feasibility such prototype reading instruction programs. Widespread introduction of these programs several years from now will lead to an even further increase in the number of children who read successfully.

3. New Reading Instruction Systems

There exist populations and situations in America for which effective reading instruction systems are lacking. This appears to be the case with minority group children who speak nonstandard English dialects, such as inner-city Negro children, or with Spanish-speaking children. Further, effective reading instruction systems are lacking even for children who come from advantaged populations, but who have highly individual learning styles. Accordingly, the third responsibility of CER is to design and develop new reading instruction systems for those populations or situations which lack them. These new systems, when completed and demonstrated to be effective, will be incorporated into the prototype reading instruction programs developed under responsibility two, above. Reaching this third milestone will mean that reading instruction systems and programs exist which, if implemented nationwide, will lead to successful reading performance on the part of all American school children.

4. Measures of Goal Attainment

Progress toward Dr. Allen's goal will be made, thus, in many steps over the ten-year period. Unfortunately, there now exists no means of measuring this progress. Many tests of reading performance exist, but since they are norm-referenced (that is, they describe performance of children in relation to the performance of other children) they are not capable of describing mastery or terminal behavior in reading, such as the ability to read the front page of a major metropolitan newspaper at a given speed and level of understanding. Accordingly, the fourth responsibility of CER is to create instruments which measure the extent to which a student has mastered both the skill and the desire to read.

5. Introduction Plans (Marketing Plans)

The products of the four preceding CER activities will be effective reading instruction practices, systems, and programs, and instruments for measuring mastery of skill and desire in reading. Unfortunately, there now exists no means for introducing nationwide these urgently needed products. The American educational endeavor has never tried to set up such a nationwide implementation system. Even criteria for judging the effectiveness of proposed such systems are lacking. Accordingly, CER's fifth responsibility is to develop criteria for selecting introduction plans (marketing plans) which will lead local agencies to adopt those research and development products which lead to attainment of the goal of the Right to Read Effort.

6. Special Studies

Finally, although the previous steps may produce effective systems, they may prove too expensive for widespread use. That matter, and other problems, deserve special study. The sixth responsibility of CER, thus, is to sponsor special activities in reading upon which improved reading practices and systems may be built, or which will contribute in other ways to the Right to Read Effort.

Summary

The six CER responsibilities under the Right to Read Effort are summarized below:

1. Effective Reading Instruction Practices

   To identify and test existing reading instruction practices. To select, for suggested adoption by local agencies, those practices which demonstrate effectiveness in teaching reading.

2. Existing Reading Instruction Systems and Programs

   To identify and test existing reading instruction systems. To select those which are effective and assemble them into prototype reading programs which will provide effective reading instruction to all mixes of student populations or in all situations for which local agencies are responsible.

3. New Reading Instruction Systems

   To develop knowledge for designing effective reading instruction systems. To design and develop new reading instruction systems for those populations or situations which lack them.

4. Measures of Goal Attainment

   To create instruments which measure the extent to which a student has mastered both the skill and the desire to read.

5. Introduction Plans (Marketing Plans)

To develop criteria for selecting introduction plans (marketing plans) which will be most effective in persuading local agencies to adopt effective reading instruction products.

6. Special Studies

To sponsor special studies in reading, different from those discussed earlier, upon which improved reading practices may be built, or which will contribute in other ways to the Right to Read Effort.

1. Effective Reading Instruction Practices

Problem

Even though many effective practices for improving the teaching of reading exist, a large number of children are deprived of the benefits of such practices because we lack procedures for identifying and evaluating those which are effective, and for encouraging their widespread use. Unfortunately many demonstrably effective reading practices--such as the use of pupil grouping techniques, color-coded texts, paraprofessionals, book fairs, diagnostic procedures, workbooks, flash cards, instruction which exploits new architectural designs, and so forth--are limited to small groups of users, typically those creative teachers and researchers who have developed them.

Objective

To prepare criteria for identifying and selecting effective practices for improving the teaching of reading. To obtain descriptions of practices believed to be effective. To test these practices against the prepared criteria and to designate for widespread dissemination those which are demonstrably effective.

Strategy

Two sets of criteria will be developed: (1) for determining whether a proposed practice is generalizable, and (2) for determining whether a proposed practice is effective. These criteria will be established by a panel of reading experts. Next, in cooperation with state and local agencies, a survey will be performed to obtain descriptions of those practices believed to be effective. Finally, the proposed practices will be evaluated by the criteria, again in cooperation with state and local agencies. Those which are effective will be designated for dissemination.

Schedule and Cost

Year	FY 71	FY 72	FY 73	FY 74	FY 75	FY 76
Duration	———	———				
$ Millions	.05	5.50				

2. Existing Reading Instruction Systems and Programs

Problem

Children of different language and cultural backgrounds require different instructional materials if they are to succeed in reading. Unfortunately, currently available reading instruction programs offer an extremely narrow range of alternative materials and methods. A direct consequence of this narrowness is reading failure on the part of many children. This is obvious in the case of children who speak minority group dialects and languages: inner-city Negro children who speak a form of non-standard English, Mexican-Americans, Puerto Ricans, and American Indians. These children are asked to learn to read within a system which is not appropriate to their capacities or needs. Also, even in populations which are linguistically and culturally homogeneous, different learning styles require different reading instruction systems. We lack, however, programs which incorporate a range of reading instruction systems broad enough to encompass all the linguistic, cultural, socio-economic, age-group, and other populations for which local agencies are responsible.

Objective

To identify and test existing reading instruction systems. To select those which are effective and assemble them into prototype reading programs which will provide effective reading instruction to all mixes of student populations or situations for which local agencies are responsible.

Strategy

Criteria for judging (1) completeness and (2) effectiveness of reading instruction systems will be developed by a panel of reading experts. In cooperation with State and local agencies, developers of reading instruction systems will be encouraged to submit them for evaluation. Proposed systems will be evaluated by the criteria established. Those systems which pass both sets of criteria will be used in assembling prototype reading programs designed to be effective with all mixes of populations or situations for which local agencies are responsible. Those systems which do not pass the criteria for completeness, but which nevertheless appear promising, will be analyzed to determine what components are lacking. A survey of the country will be made to determine the availability of needed components. Incomplete systems which could pass the criteria by adoption of available components will be considered for incorporation into the prototype reading programs.

Schedule and Cost

Year	FY 71	FY 72	FY 73	FY 74	FY 75	FY 76
Duration	———					
$ Millions	0.05	5.00	5.00	0.45		

3. New Reading Instruction Systems

Problem

A basic assumption of the Right to Read Effort is that there now exist complete or nearly completed and tested reading instruction systems for all the populations or situations which will require them. This assumption may be wrong. Certain students in certain phases of their development may require learning experiences not provided by any available reading instructional system. Unless appropriate new systems are designed and developed, the goal of the Right to Read Effort will not be reached.

Objective

To develop knowledge for designing effective reading instruction systems. To design and develop new reading instruction systems which are significantly different in content or delivery from those we now have, and which will teach effectively the required skills and desires to those populations or in those situations for which effective systems are now lacking.

Strategy

Three parallel activities must be undertaken in this area. First, reading professionals in cooperation with sociolinguists and others must specify those populations or situations which are not served by existing systems. Second, a knowledge base must be developed for designing systems which are significantly different in content or delivery from those now existing. Third, new systems aimed at the specified populations and exploiting the developing base must be developed. Fortunately, work in each area is already underway, much of it sponsored by the Office of Education. A further responsibility of CER, therefore, is to insure that each of the three activities exploits progress in the other two.

Schedule and Cost

Year	FY 71	FY 72	FY 73	FY 74	FY 75	FY 76
Duration	———	———	———	———	———	
$ Millions	3.50	6.00	7.00	8.00	3.00	

4. Measures of Goal Attainment

Problem

Almost all existing measures of reading achievement are norm-referenced; i.e., they adequately describe a subject's performance in relation to the performance of other subjects in a given population, but they do not describe performance in relation to mastery or terminal behavior. The development of criterion-referenced measures of reading competence is an absolute necessity if we are to know how well the Right to Read Effort is meeting its goal. Two further constraints are to be imposed upon measures developed as part of the Right to Read Effort:

1. The measures are to be "real-world-oriented"; i.e., they are to be derived from reading tasks which are actually encountered in our culture; and

2. Performance on the measures is to be highly "reading-dependent"; it should be impossible to obtain a high score on such a measure without having read a prerequisite passage.

Objective

To create instruments which measure the extent to which a student has mastered the skill as well as the desire to read.

Strategy

This objective is to be attacked through two parallel efforts followed by a third and a fourth effort in sequence. Work in Phase 1 of the Targeted R&D Program on Reading will provide performance standards for adult literacy in our culture. While this work is going on, other efforts through the labs and centers will focus upon criterion-referenced testing of reading skills in young children. Once the adult standards are established in the form of a test instrument, research efforts will examine the possibility of building a sequence of instruments which, together, measure a subject's progress through the entire process of learning to read. Development of that sequential test battery would complete work on this objective.

Schedule and Cost

Year	FY 71	FY 72	FY 73	FY 74	FY 75	FY 76
Duration	———	———	———			
$ Millions	.50	.50	.75			

5. Introduction Plans (Marketing Plans)

Problem

The products of the four preceding reading program activities will be: (1) demonstrably effective reading instruction practices, (2) prototype reading programs assembled from effective existing systems and practices, (3) effective new reading instruction systems for populations and situations for which previously existing systems were not effective, and (4) instruments for measuring mastery of reading skill and desire. Unfortunately, there now exists no means for introducing nationwide these urgently needed products. The emphasis of the American educational endeavor on local control of schools has precluded, until the present, development of such a nationwide implementation system. Even criteria for judging the effectiveness of such proposed systems are lacking.

Objective

To develop criteria for selecting introduction plans (marketing plans) which will lead local agencies to adopt effective reading programs.

Strategy

The techniques used in American industry to develop marketing plans will be applicable in this activity. The criteria will cover factors such as:

1. Effectiveness in persuading local agencies to adopt suggested reading programs.
2. Effectiveness in persuading appropriate institutions to provide required components.
3. Specification of outcomes.
4. Range of reading program approaches encompassed.
5. Applicability to various local agencies.
6. Inclusion of a system for monitoring the plan.
7. Specification of costs, time, manpower, and other resources required to implement the plan.

Schedule and Cost

Year	FY 71	FY 72	FY 73	FY 74	FY 75	FY 76
Duration		———				
$ Millions		.05				

6. Special Studies

Problem

It is assumed that the most effective approach to improving the reading performance of children is through implementation of the reading instructional practices, systems, and programs to be identified or developed by CER. However, these successful approaches may be too expensive for widespread use. Consequently, it is desirable to explore other approaches for improving reading performance.

Objective

To sponsor special studies in reading, different from those discussed earlier, upon which improved reading instruction practices may be built, or which will contribute in other ways to the Right to Read Effort.

Strategy

Stand ready to explore alternatives as they arise during the course of the basic work already planned.

Undertake two specific studies immediately:

1. Effectiveness of Remediation Compared to Early Instruction. Examine the cost-effectiveness of employing remediation relative to beginning the teaching of reading at the earliest possible age to the kind of children who often need remediation. Also, determine whether remediation is more effective with certain sub-populations of children who have had specific experiences in early childhood.

2. Effectiveness of an Emphasis on Accountability. Several local school systems will be encouraged to adopt a system of accountability for learning, without making any special changes in the way reading is taught. Over time, the pressure for accountability alone may force those agencies to make reading instruction more effective, even with no major change in existing instructional procedures.

If these two studies or others of the same type are successful, the cost of the entire Right to Read Effort may be reduced considerably.

Schedule and Cost

Year	FY 71	FY 72	FY 73	FY 74	FY 75	FY 76
Duration		———	———			
$ Millions		.75	.25			

Five-Year Budget Projections
in $ Millions

Reading

Problem Area	1972	1973	1974	1975	1976	5 Year Total
1. Effective Reading Practices	5.50					5.50
2. Existing Systems & Programs	5.00	5.00	.45			10.45
3. New Reading Systems	6.00	7.00	8.00	3.00		24.00
4. Measures of Goal Attainment	.50	.75				1.25
5. Introduction Plans	.05					.05
6. Special Studies	.75	.25				1.00
	17.80	13.00	8.45	3.00	———	42.25

EARLY CHILDHOOD

USOE CER Research and Development Plans for FY 72-76

The tenet of American society which assumes all men are created equal has also created the expectation that all of America's children will receive an equal educational opportunity. The primary responsibility for this has been entrusted to the public schools, as the means through which all children are to develop the skills and attitudes necessary to the acquisition of competence and full participation as American citizens. Increasing evidence has shown, however, that for a large number of American children this expectation is not being met, and that, in fact, as early as the end of the primary grades these children have neither the foundation in the basic skills, the necessary background of experience, nor the necessary attitudes for success in the remaining school years. As a result, there is a widening discrepancy between the types and level of skills that children are acquiring by the end of the primary grades and what they should be acquiring.

The significance and magnitude of this discrepancy is continually increased by the fact that there is an accelerating rate of change in the political and social framework of the American society which implies even heavier demands in the future upon the child and the educational system which prepares him. For example:

- There is a widening gap between the majority of American citizens who are reaping the benefits of an affluent society and those who are economically deprived.

- There is a crisis of civil rights which has focused especially on equality of educational opportunity and which has led to the realization that opportunity is empty unless environmental circumstances provide enough support to insure educational success.

- There is increasing technological development creating a demand for highly abstract and symbolic thinking abilities in an increasing proportion of the work force, with a subsequent declining opportunity for agricultural, semi-skilled and unskilled workers.

Thus, increasing pressure is being placed on the educational system to find ways to insure that all young children have the skills, abilities, and motivations necessary for an equal start in a complex society. It is also clear that for a variety of reasons the schools have been unable to meet traditional expectations for all of the students who attend.

The importance of this problem is supported by a large body of evidence that the first eight years of life are especially critical to the future life of the individual. For example, J. Mcv. Hunt, in his book

Intelligence and Experience, presents evidence which shows that if the objects or people in the child's environment do not provide enough challenge to stimulate his mind to further growth, the child will not develop optimally. Hunt's book initiated widespread interest in intellectual growth of the young child and focused attention on the possibility of influencing the child's later development by modifying the environment during these early formative years, as opposed to passively awaiting the unfolding of inborn capacities.

Benjamin Bloom, in his book Stability and Change in Human Characteristics, maintains that the environment has its greatest impact during the time of most rapid development and that as much intellectual growth takes place by four years of age as takes place during all of the elementary and high school years combined. Bloom further maintains that an additional 30 percent of the growth in human intelligence occurs between the ages of four and eight. Earlier works by Freud, Montessori, Piaget, Pestallozzi, Froebel and others have also stressed that basic motivational, emotional, and social patterns are also set at these early ages.

Despite the growing evidence of the importance of the early years, there does not yet exist a well-established knowledge base which identifies those specific factors in the environment or learning situation which will insure the acquisition of the basic skills.

Current Groups Involved in Early Childhood Education

Traditionally, the home and the elementary school have had the responsibility for the child's education during his first eight years of life. Unfortunately, the allocation of responsibility has failed to insure that all children receive the foundation they need. In light of the increasing evidence that this foundation must be laid before the age of eight years, there has been an increasing demand for additional educational programs, both in and out of school. This demand has resulted in the participation of a variety of institutions and organizations who have assumed some of the responsibility for administering and augmenting early childhood education programs. For example:

- The Federal Government, through such programs as Headstart, Follow Through, Parent and Child Centers, and Day Care;

- The State and local government agencies through the establishment of kindergartens where they have not previously existed, and with the introduction of formal public school programs for even younger children;

- The private nursery schools, which are often run by trained, professional personnel and who are sometimes aided by interested mothers;

- The business sector, through the establishment of day care facilities for the children of employees and through franchised day care and preschools;

- The mass media, through commercial outlets, such as Romper Room, and through public outlets such as Sesame Street and Misterogers Neighborhood.

Although the American society is becoming increasingly aware of the discrepancy between its expectations for the education of young children and the actual achievements of children, there has not existed a planned, coordinated, comprehensive national program to deal with the total problem. Growing national concern is evidenced by a variety of actions at the Federal level: (1) the recent consideration by the Congress of two comprehensive bills on early childhood education, and one on day care; and (2) by the establishment under the Secretary of Health, Education, and Welfare by the President's Science Advisory Committee of a special task force on early childhood education.

Policy Considerations

The U.S. Office of Education has a clear responsibility to help to marshal all resources for program activities which may help to solve the critical problems in early childhood education. Policy considerations and discussions which form the basis for the program activities in early childhood education may be summarized as follows:

1. Initiating, funding, coordinating, and monitoring functions are to be performed by NCERD, primarily. New and expanded functions are to be performed by the National Institute of Early Childhood Education (NIECE), which replaces the former National Laboratory of Early Childhood Education (NLECE). With direction from NCERD, NIECE will design, plan, perform, and evaluate OE program activities in Early Childhood Education.

2. The nature and scope of the early childhood education program should be focused on research and development activities related to skill deficiencies, and which provide instructional systems for compensatory, equalizing educational experiences.

3. The research and development activities should provide instructional systems for a narrowly defined set of educational experiences related to these skill deficiencies.

4. The research and development activities should be focused on instructional systems for discrete educational experiences, rather than for continuous schooling.

5. The research and development activities should produce instructional systems for educational experience which are focused intensively on one or two skill deficiencies over a constant time period.

6. The research and development activities should be programmatic and sequential.

7. The early childhood education program should seek to promote multiple solutions to a common problem.

8. Adequate funds to accomplish the goals of the program should be firmly earmarked as soon as feasible.

PROGRAM OBJECTIVES AND ACTIVITIES

Development of Cognitive and Affective Skills

The fundamental goal of the program activities of OE in early childhood education will be to provide the necessary research and development work to help children to develop the specific skills required for both successful entry into formal academic settings and for successful performance in later elementary school grades. Because it is not feasible to deal with all of the skills that might be potentially useful, the early childhood education program in OE will focus on the development of instructional systems that, when experienced, will increase skills which are related to two broad classes of development outcomes: (a) cognitive and (b) affective. Thus no program effort in early childhood education is planned at the present time for outcomes related to psychomotor, physical or social development.

In order to facilitate or enhance cognitive and affective development, the early childhood education program will additionally focus on those skills which seem to be most important for early school success but which have proven to be chronic problems for children to attain, either because of the lack of appropriate instructional materials, the inaccessibility of educational opportunity, or the lack of performance prerequisites. These skill area are listed below:

Critical thinking, decision making and problem solving skills

Language, verbal, symbolic skills

Achieving, mastering, striving, and persisting skills

Perceptual, discrimination, recognition skills

Classification, ordering, seriation, spatial skills

Preferences, appreciations, aesthetic sensitivity

Creating, inventing, artistic, expressive skills

Social, group, personal interaction skills

Moral judgment, ethical considerations, and sensitivity to social issues

Definition of Target Populations

The students ordinarily considered to constitute the early childhood population may be generally grouped into three age ranges: five to

eight years (early elementary grades); two to five years (formal preschool years); and birth to two years (infancy). While development in the first eighteen to twenty-four months obviously has important implications for subsequent cognitive and affective development, considerable efforts, talents, and funds have been and presumably will continue to be allocated to this age range by local, state and national institutions and agencies, both public and private, other than those specifically charged with educational responsibilities. For this reason, the Office of Education's Early Childhood Education Program will focus on the first two age sub-groupings (five to eight years, and two to five years).

The implication of this definition is that the target population is narrowly defined to consist of children at two age levels who can be characterized by the type of cognitive or affective skill deficiency they manifest or are likely to manifest in the nine skill areas outlined previously. (See Table I)

TABLE I

Target Population of the Early Childhood Education Program in Terms of Age Level and Area of Skill Development

	0 - 2	2 - 5	5 - 8
Cognitive		x	x
Affective		x	x
Psychomotor			
Physical			
Social			

For a variety of reasons it is probable that these target populations will be drawn most heavily from economically disadvantaged areas.

Types of Research and Development Activities Needed

1. Assessment of the severity of the problem, determination and location of each of the target populations. This requires research on the design and the development of instruments and measuring devices.

2. Reviews and analysis of research from the social and behavioral sciences relevant to each of the skill areas to determine where additional research is needed and as a basis of identifying alternatives.

3. Design of instructional materials and systems, product specifications, product development, production, and establishment of performance criteria.

4. Pilot tests and revision of materials until they attain performance criteria.

5. Coordination and cooperation with those organizations who have the responsibility for operating early childhood education systems.

6. Development of methodologies, and designs to evaluate the longitudinal effects of early intervention programs.

7. Research to establish the management and organization of early childhood learning activities to provide for efficient use and maintenance of the instructional experiences.

Model of Scope of Research and Development Activities in Early Childhood Education

The general scope of the Research and Development activities can be represented by a two dimensional matrix as shown in Figure 1. The types of R and D activities that might be undertaken are placed on the columns, the target populations and skill areas are placed on the rows. It is possible then to shade in the cells in the figure where research and development activities are already completed and underway and thus to show what remains to be performed to complete the goals of the early childhood educational program.

It will be the responsibility of the National Institute for Early Childhood Education to design and plan specific sets of activities for this matrix. Then, it will be possible to make more precise statements about the specific activities that will be undertaken, to adopt a firm time schedule for completing them, and to provide increasingly accurate projection of their costs.

However, through the analysis of the policy considerations, the program goals, and the types of R and D activities that will be needed, it already has been possible to rule out a large number of the alternative activities for the early childhood education program and to set some priorities as well.

Scope of Research and Development Activities in Early Childhood Education

FIGURE 1

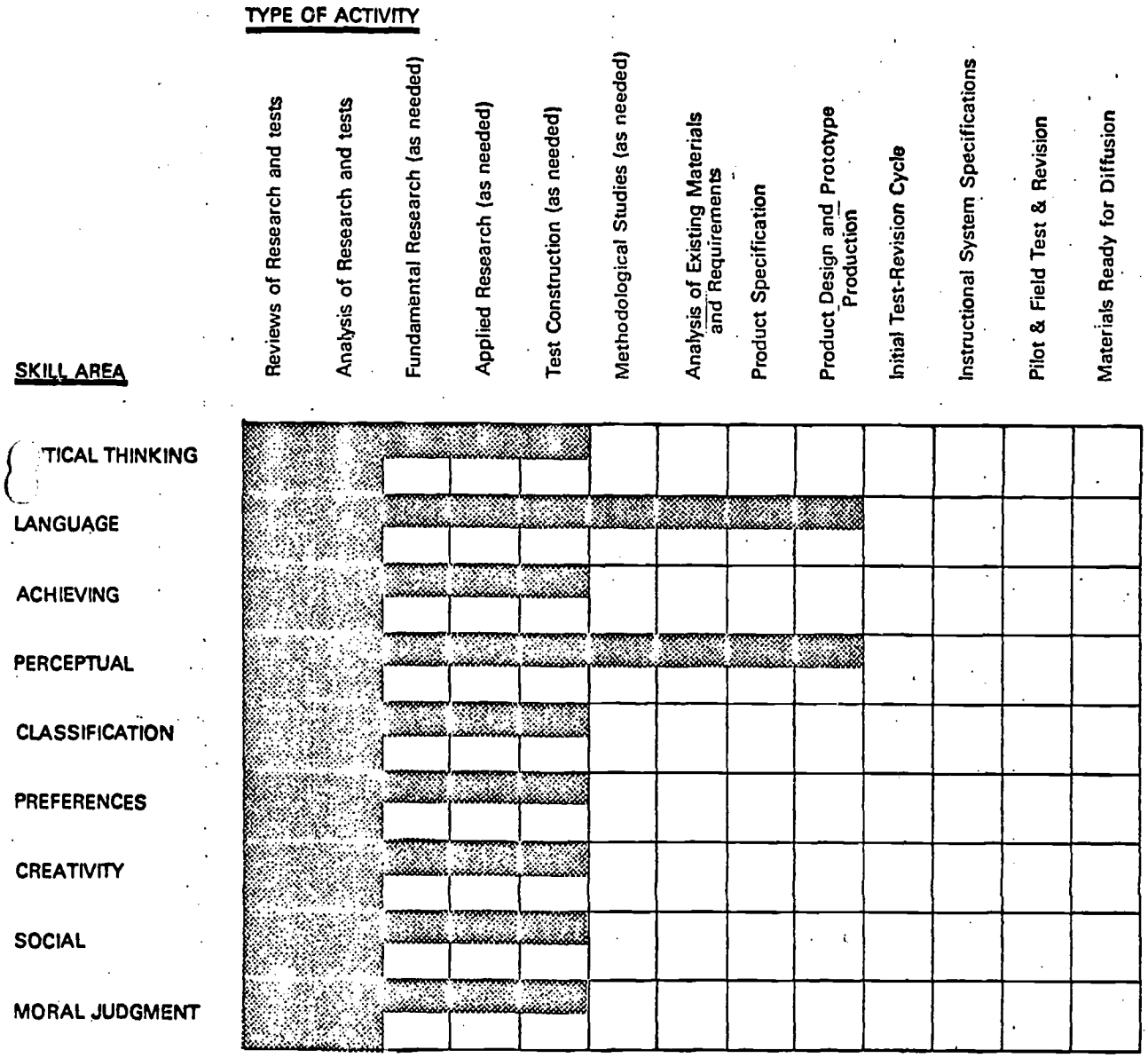
SKILL AREA	Reviews of Research and tests	Analysis of Research and tests	Fundamental Research (as needed)	Applied Research (as needed)	Test Construction (as needed)	Methodological Studies (as needed)	Analysis of Existing Materials and Requirements	Product Specification	Product Design and Prototype Production	Initial Test-Revision Cycle	Instructional System Specifications	Pilot & Field Test & Revision	Materials Ready for Diffusion
	TYPE OF ACTIVITY												
CRITICAL THINKING													
LANGUAGE													
ACHIEVING													
PERCEPTUAL													
CLASSIFICATION													
PREFERENCES													
CREATIVITY													
SOCIAL													
MORAL JUDGMENT													

Timing of Activities

The skill areas where work will be performed and the specific types of research and development activities which will be underway for each of five successive fiscal years beginning in Fiscal 1972 are shown in Figures 2-6. In these figures, cells corresponding to skill areas and to functions where work will be substantially completed during the year are completely shaded in.

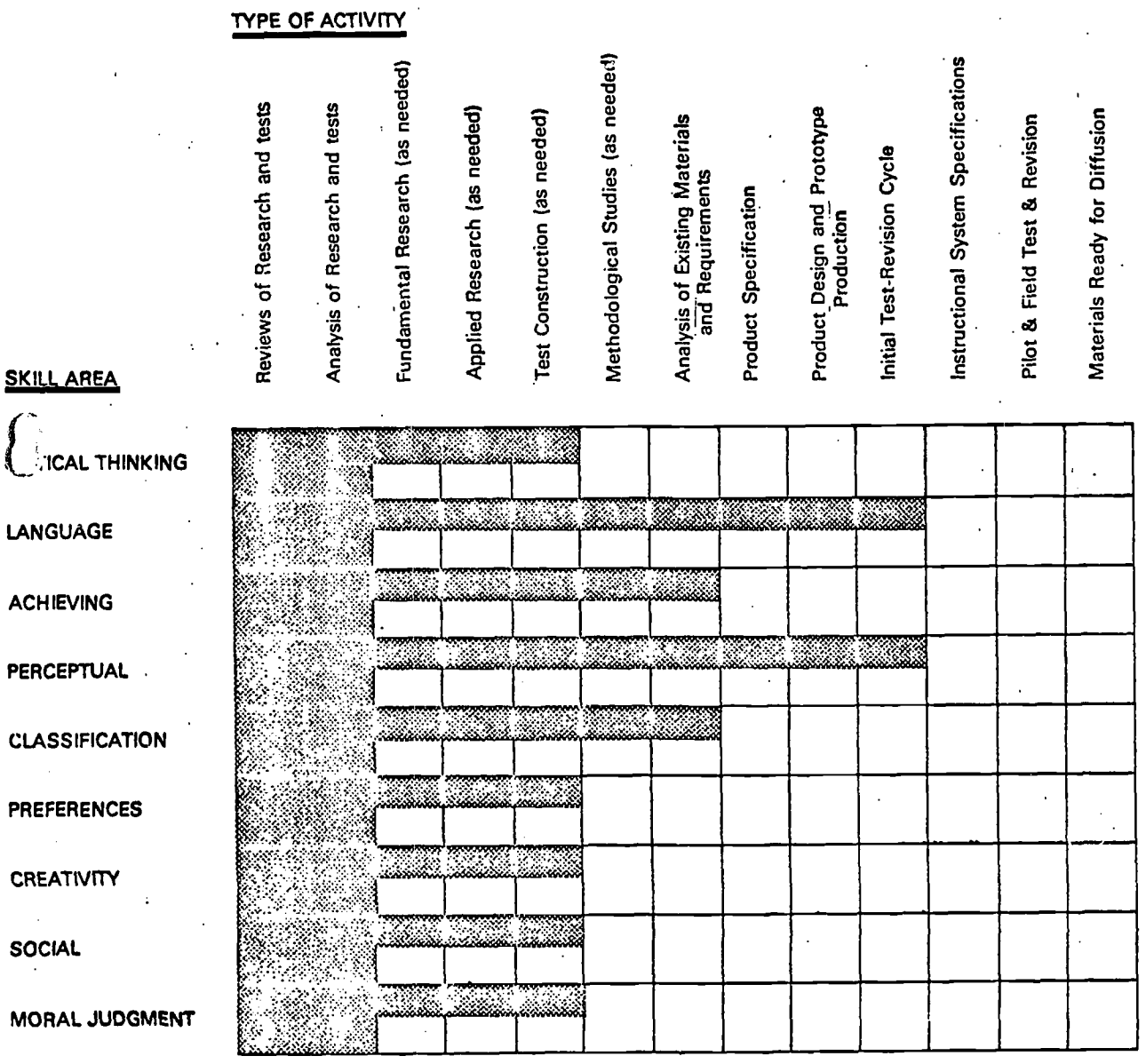
Scope of Research and Development Activities in Early Childhood Education

FIGURE 2 UNDERWAY OR COMPLETED IN FISCAL 1972



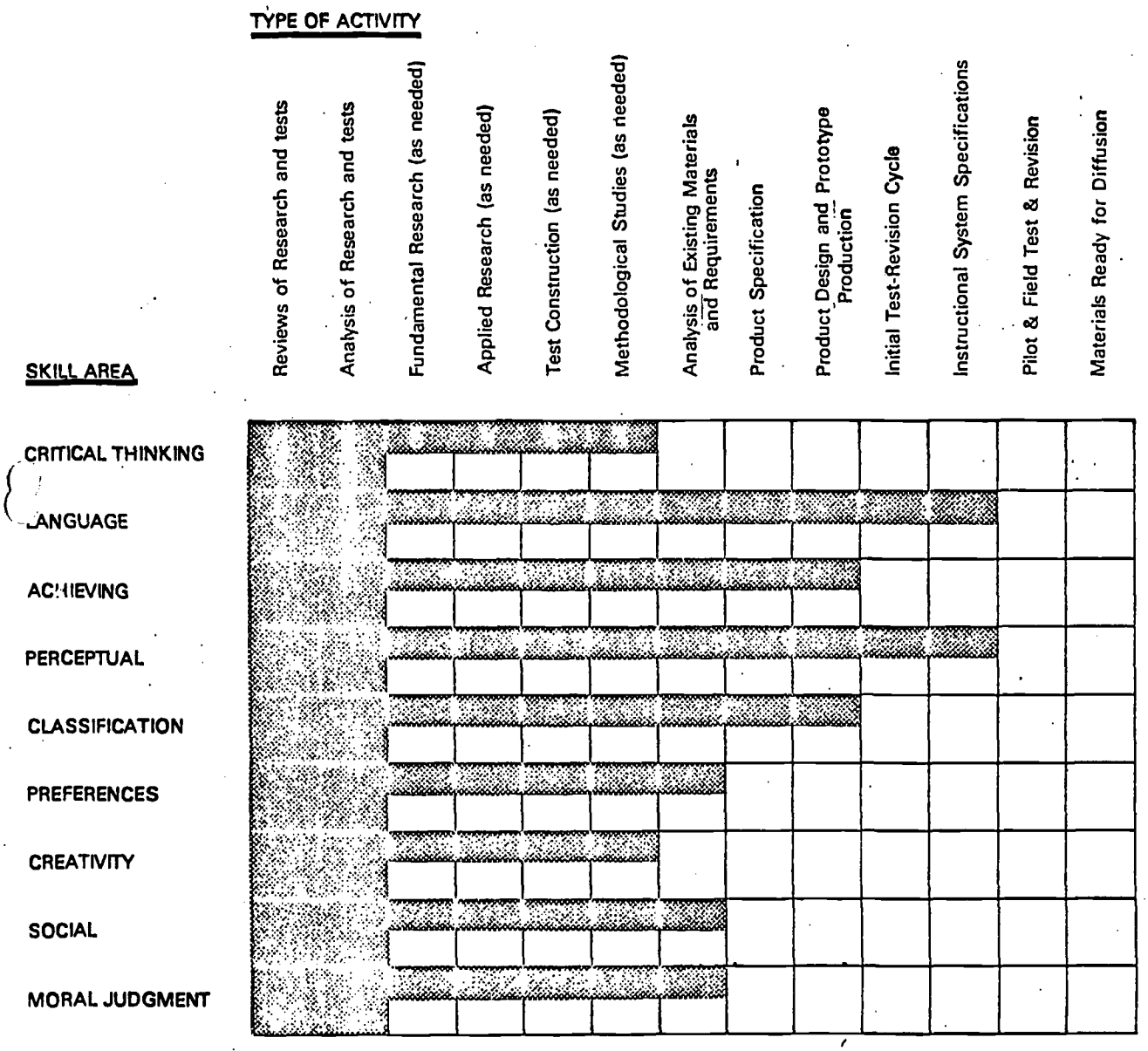
Scope of Research and Development Activities in Early Childhood Education

FIGURE 3 UNDERWAY OR COMPLETED IN FISCAL 1973



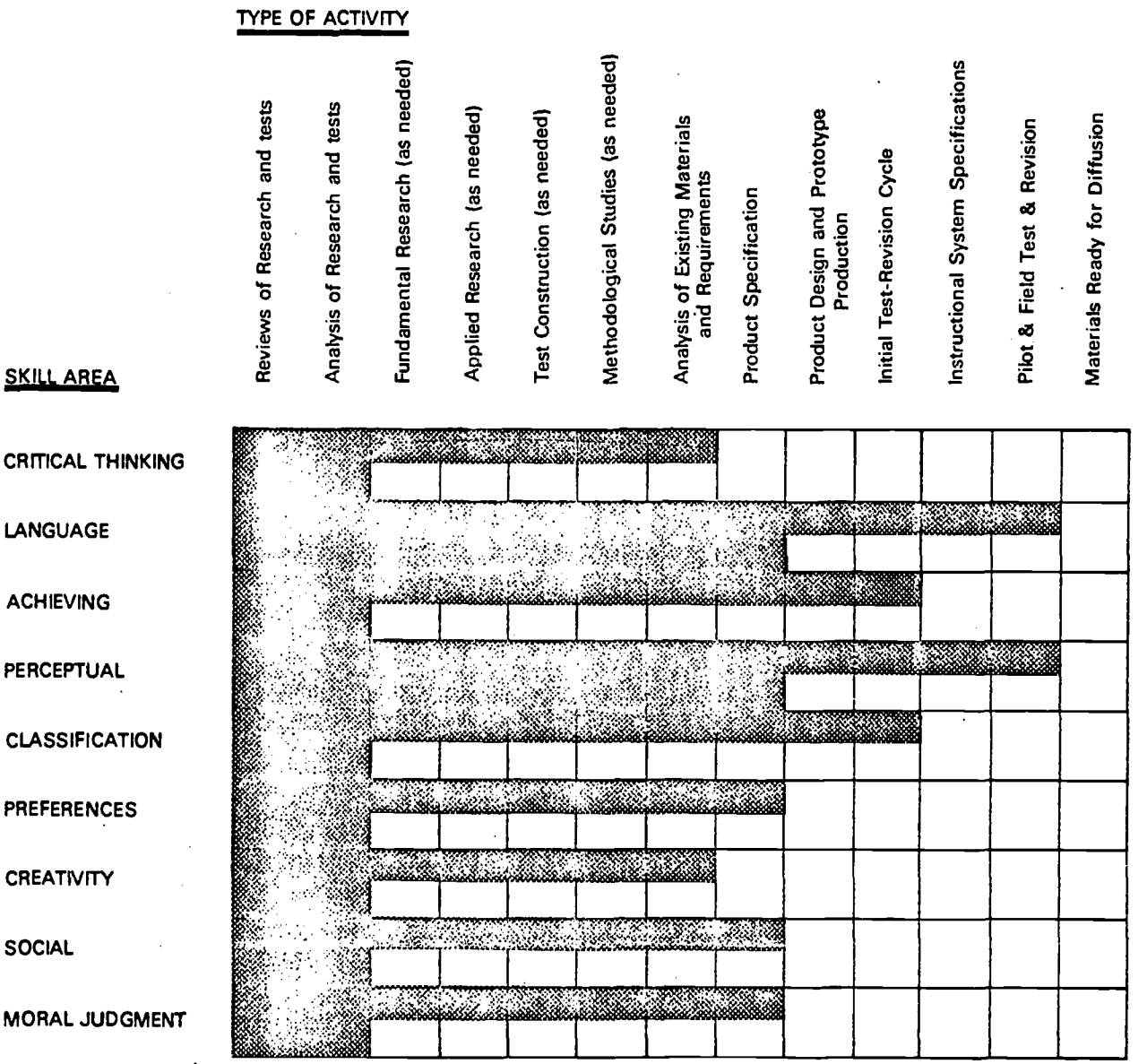
Scope of Research and Development Activities in Early Childhood Education

FIGURE 4 UNDERWAY OR COMPLETED IN FISCAL 1974



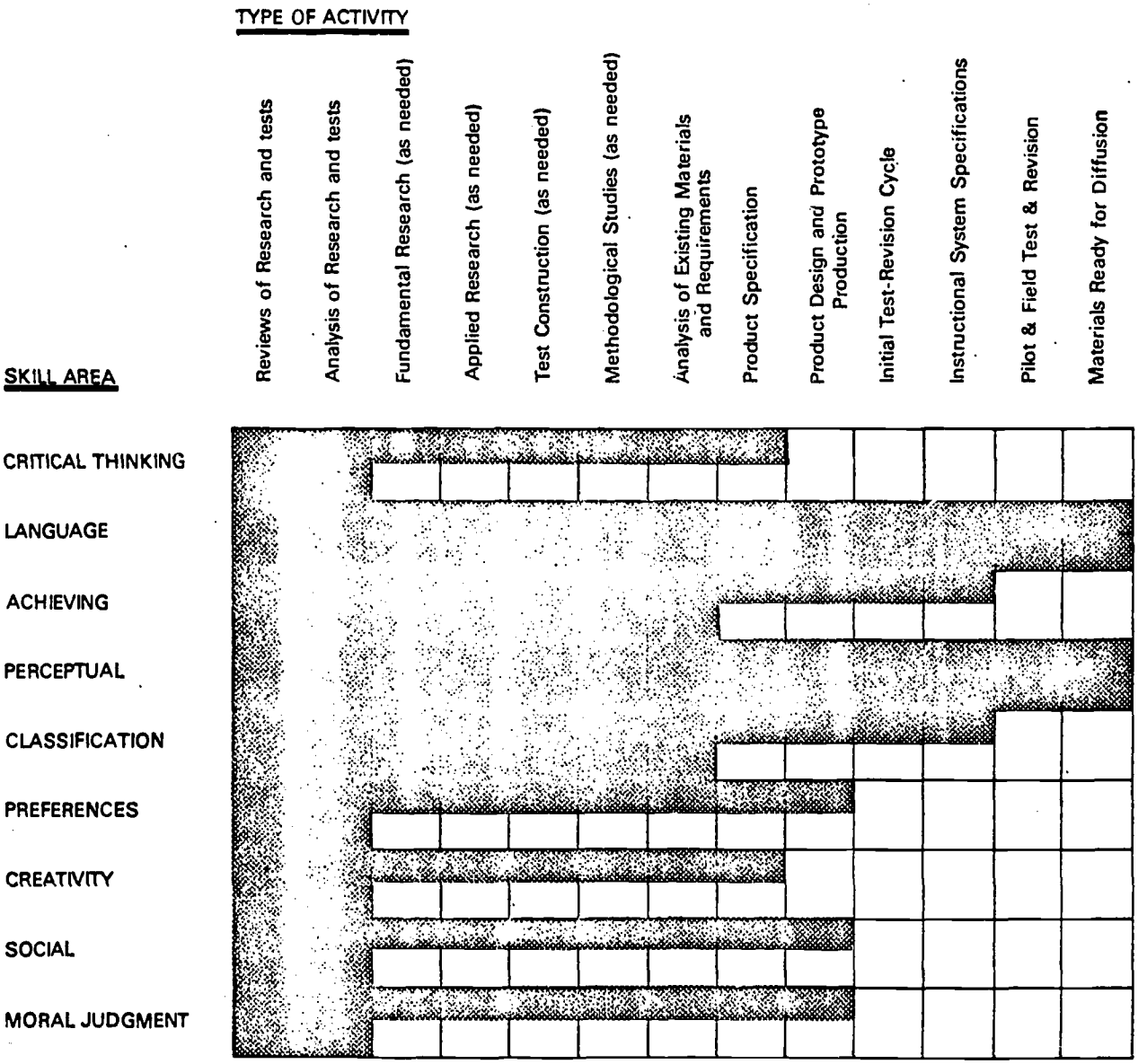
Scope of Research and Development Activities in Early Childhood Education

FIGURE 5 UNDERWAY OR COMPLETED IN FISCAL 1975



Scope of Research and Development Activities in Early Childhood Education

FIGURE 6 UNDERWAY OR COMPLETED IN FISCAL 1976



Budget Projections

Cost estimates for the five year period and cumulative total expenditures for each skill area are shown in the Table below. These estimates are based upon experience with existing programmatic research and development activities in NCERD, and will need to be revised as more detailed specifications of the activities for each year are available.

Five-Year Budget Projection
$ millions

Early Childhood

	Skill Area	1972	1973	1974	1975	1976	5 Year Total
1.	Critical Thinking	.50	1.00	2.00	3.00	4.00	10.50
2.	Language	1.50	3.00	4.00	5.00	3.00	16.50
3.	Achieving	.25	.50	1.00	2.00	2.50	6.50
4.	Perceptual	1.00	2.00	3.00	4.00	4.00	14.00
5.	Classification	.50	1.00	1.50	2.00	2.50	7.50
6.	Preferences	.25	.50	1.00	1.50	3.00	6.25
7.	Creativity	.25	.50	1.00	1.50	2.00	5.25
8.	Social	.25	.50	1.00	1.50	2.50	5.75
9.	Moral Judgment	.50	.50	1.00	2.00	3.00	7.00
10.	Special Studies	.50	1.00	1.00	1.00	1.00	4.50
		5.50	10.50	16.50	23.50	27.50	83.50

VOCATIONAL EDUCATION

USOE CER Research and Development Plans for FY 72-76

The rapidly changing world of work and other factors are causing rising unemployment while at the same time there are grave shortages of trained personnel in certain occupational areas. The fact that the employment fields are shifting ever more rapidly, as a result of the increasing impact of science and technology, establishes the need for vocational program graduates who are prepared to adjust to changing occupational requirements during the entire course of their working lives. This in turn requires (1) improved vocational curriculum materials and practices based on (2) new and better information about the present and future needs of the labor market and (3) more efficient systems for providing the required information, for evaluating the results of occupational programs, and for planning future programs.

With the development and installation of tested systems, vocational education with the changing occupational needs of society can be kept in line and can help the individual student realize his potential.

General Goal

CER's goal is to perform research and to develop vocational education programs that will attract students and permit them to maximimize their career and personal development.

CER will give special attention to persons with special needs - those with physical, psychological, social, cultural, economic and/or academic limitations which prevent them from succeeding in regular vocational programs.

In order that students may benefit from vocational education and so that the purposes of vocational education legislation may be achieved, leaders in the field have indicated that the following programs should be provided for each identified target audience.

Occupational Information

All elementary school children should learn about work roles, develop basic concepts about employment, become familiar with the world of work, and develop an awareness of the options in different fields of work.

Occupational Exploration

All intermediate school children should have experiences which create understanding of the relationships among employment, career development, education, and individual interests, aptitudes and capabilities, so that they may make realistic educational decisions.

Occupational Preparation

At the high school level, all students should make tentative career choices and should have access to occupational instruction.

Advanced Occupational Preparation

Advanced occupational instruction should be provided to those enrolled in two-year post secondary programs.

Occupational Preparation, Retraining and Upgrading

Vocational or technical instruction should be available to those who have completed or discontinued their formal education and are preparing to enter the labor market and to those who have already entered the labor market and need training or retraining to achieve stability or advancement in employment.

Major Problem Areas

In determining how R&D resources could be allocated to serve the five target audiences most effectively, a number of important factors were delineated and explored. These can be grouped under four problem headings: vocational opportunity, vocational education student, vocational education program, and vocational education product.

The "vocational opportunity" is defined as the employment available to the student terminating a vocational education program.

The "vocational student" is the raw material for the vocational education program. Certain kinds of activity must be generated to get him into the program, to monitor his progress through it and, afterward, to place him in a job which is suitable.

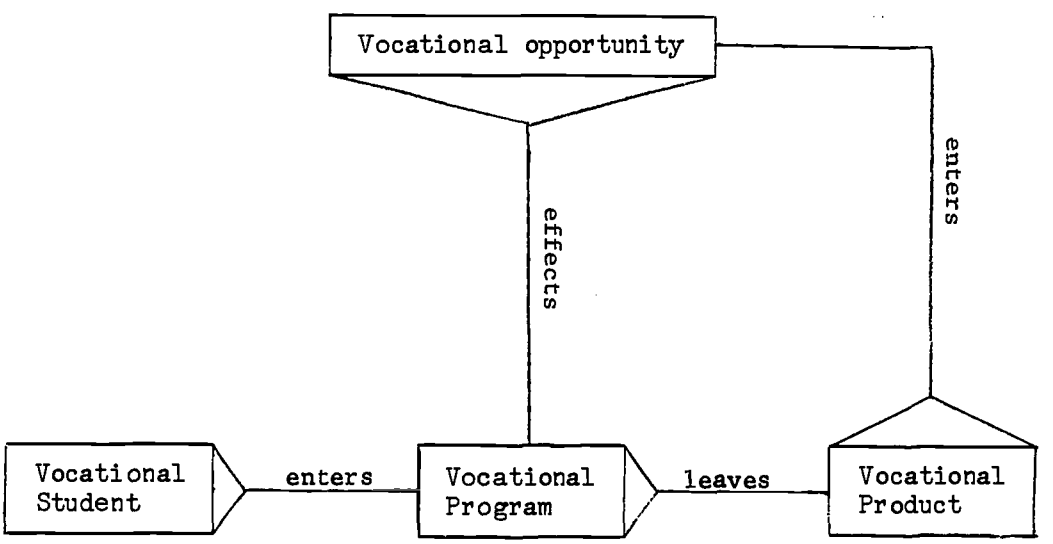
The "vocational program" embraces a series of components such as, curriculum, instructional systems and educational administration.

The "vocational product" is the output of the vocational education program. The desired output of the program is a graduate who has developed sufficient abilities and attitudes to enter the labor market or continue his vocational or academic education. Upon entering the world of work, he is capable of advancing in his chosen career and adjusting to changing business practices or production processes. Graduates with these characteristics are, in effect, the ultimate objective of the vocational education system.

Figure 1 illustrates the interrelationships of the problem headings.

Figure 1

Relationship of problem headings



Additional Limiting Factors

In analyzing the R&D objectives implied in the matrix, three additional factors were considered: demographic, socioeconomic, and professional personnel. An array of these additional delimiting elements is presented in Table 1.

Table 1.

Elements Considered in an Analysis of Vocational Education Research and Development Activities

1.	Demographic	1. Urban 2. Suburban 3. Rural
2.	Socioeconomic	1. Advantaged 2. Disadvantaged
3.	Professional Personnel in Vocational Education	1. Resources allocators (administrators) 2. Instructional personnel a. Teachers b. Aides c. Librarians 3. Student services personnel a. Guidance Counselors b. Social workers c. Psychologists d. Special education teachers e. Health staff f. Food services staff 4. Program development personnel a. Textbook writers b. Media specialists

Reduction of Target/Problem Matrix

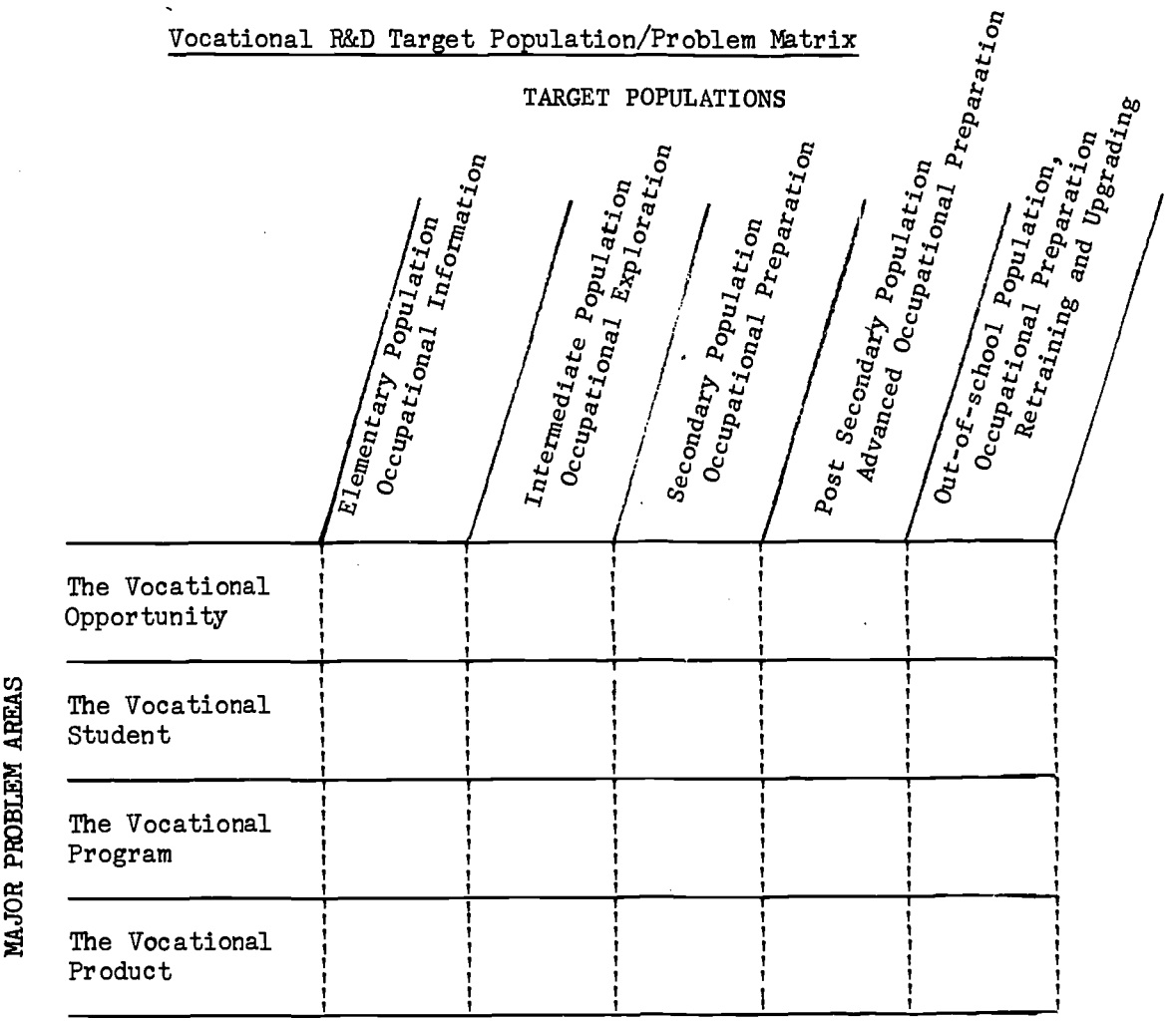
The vocational education R&D matrix of Figure 2 was reduced so that efforts could be focused on the most critical aspects. This was done by querying both a panel of experts and the NCERD staff. In summary, the disadvantaged are to receive primary emphasis among two target populations (Secondary and Post Secondary) in three problem areas (Vocational Opportunity, Vocational Program, and Vocational Student). (See Figure 2.)

Target Populations and Problem Areas

Placed in relationship to each other, the five target populations and the four major problem areas intersect in this manner:

Figure 2

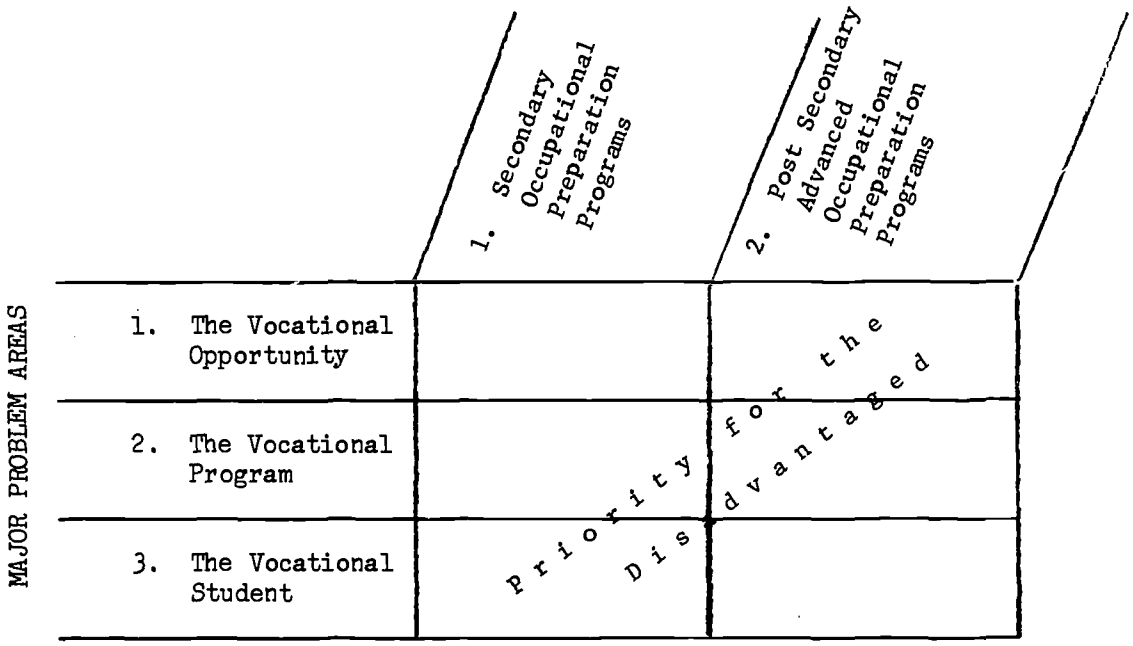
Vocational R&D Target Population/Problem Matrix



The cells in this matrix indicate areas where research and development resources could be allocated.

Figure 3

Reduced Vocational Education R & D Matrix



The following section of the report is a discussion of the R & D problem areas. Following this discussion, a time chart and budget estimates are presented.

1. Manpower and Job Information

Problem

Administrators lack access to demographic, labor market and manpower data which indicate the nature of current and future employment opportunities suitable for their students. Consequently, they do not know which vocational programs should be made available. Moreover, personnel responsible for the development of instructional materials and practices lack sufficient knowledge about changing job content, skill requirements and employer specifications to design appropriate curricula and other vocational instructional materials. Similarly, vocational guidance personnel need much more information on occupational demand, required competencies, working conditions, and other labor market and manpower data for proper student career decision-making.

Objectives

1. To identify required labor market, manpower, and demographic information for the different audiences and uses.

2. To develop, demonstrate and evaluate a systematic procedure for collecting and organizing appropriate demographic labor market, and manpower data for the different audiences and uses.

3. To develop, demonstrate and evaluate an effective training system for users of the data.

Strategy

The strategy here is developmental. It includes (1) identify the data needs, sources and flows; (2) develop the data retrieval organization patterns and data delivery systems; (3) develop the training system for use of data; and (4) demonstrate and evaluate the model program.

(1) The task of identifying needed and usable data will be performed by (a) analyzing the currently used data and locating gaps in that data and (b) querying current practitioners as to what data would be ultimately desirable.

(2) The establishment of data organization and retrieval has been a subject of wide study in both the information processing industry and the practice of vocational guidance. A state of the art survey will be commissioned in each area and a third report will be commissioned to integrate the two surveys and lead to a system design and specification.

(3) The training system to enhance the use of data is anticipated to be parallel but not identical to similar systems operating elsewhere. Thus a survey of existing training systems will locate the most usable approach.

It will then be modified in terms of characteristics of data users, relationships among users and characteristics of governmental agency relationships involved in vocational education.

(4) The demonstration will be designed by contract with the agency selected to operate the system.

Schedule and Cost

Year	FY 72	FY 73	FY 74	FY 75
Duration	⊢			⊣
$ Million	.35	.90	.65	.80

2. Curricula for New Occupations

Problem

There is very little curriculum content available for providing instruction in the new and emerging occupational areas. Further, as new technological and scientific findings develop, many existing occupational curricula need revisions or whole new approaches. New and improved curricula are especially needed for the occupational areas most critical to current national goals: public services, environmental control, health, transportation, food production and distribution, and construction industries.

Objective

To develop and demonstrate occupational curricula and vocational instructional systems that provide job information and skills essential for success in public services, environmental control, health, transportation, and food production and distribution, and construction industries.

Strategy

Use both a directed research effort and a developmental effort to (1) determine the skills needed for success in the identified occupational area, (2) discover discrepancies between skills required with skills currently taught, (3) identify the most efficient and effective methodology for developing vocational instructional systems, (4) create vocational instructional systems, and (5) demonstrate the complete vocational systems through (a) a network of vocational education supervisors and teachers and/or (b) a network of demonstration schools.

(1) Skills needed for success will be determined by securing data from people successfully performing in the occupational area.

(2) Discrepancies between skills and knowledges currently in the vocational education curriculum and those required in present and emerging occupations will be found by (a) surveying a sample of employed graduates of existing vocational education curricula and then validating the questionnaire results through a random subsample interview and (b) direct observation of employed graduates of existing curricula to determine the congruence between training received and job performance requirements.

(3) The most efficient and effective methods of creating curriculum and instructional materials will be determined by (a) a study team analyzing the methodologies of organizations currently conducting vocational education curriculum development activities (b) by a panel of expert curriculum developers.

(4) Creating the instructional systems will be created by (a) writing specifications and issuing "RFP's".

(5) Demonstrations will be accomplished both by (a) using existing networks and (b) creating new networks to link schools, the ERIC system and state department supervisors.

Schedule and Cost

Year	FY 72	FY 73	FY 74	FY 75
Duration	⊢			⊣
$ Million	3.65	7.00	8.70	10.50

3. Program Management Systems and Techniques

Problem

Management systems and administrative strategies currently available for the establishment, extension and operation of vocational education programs cannot adequately resolve the complex problems of policy development, planning, provision and utilization of facilities and equipment, budgeting and finance, staffing, pupil-personnel services, evaluation and school-student-community-industry relations. Tested alternatives are needed now and their availability will become increasingly more important as improved labor market, manpower and demographic data, new and improved curricula, and more adequate instructional systems become available as outputs of research, development and demonstration.

Objectives

1. To develop and test alternative program management systems and administrative strategies.

2. To develop and conduct training programs for administrators and program managers in the selection and use of the systems and strategies.

3. Demonstrate the systems and strategies.

Strategy

The strategy involves (1) the researching of current management models and practices in education, business and industry with subsequent development and testing of alternative vocational education program management systems, (2) the creation and operation of training program for those administrators and program managers who will participate in the demonstration of the systems, and (3) the demonstration of the management systems in secondary and post secondary institutions.

(1) The researching of current management models and subsequent development and testing of alternative program management systems will be achieved by issuing a targeted priority announcement with minimum specifications.

(2) The development and operation of training programs for those administrators and program managers who will be involved in the demonstration of the management systems and administrative strategies will be achieved by writing specifications and issuing "RFP's".

(3) A network of schools and related agencies will be selected for demonstrating the improved management systems and administrative techniques.

Sehedule and Cost

Year	FY 72	FY 73	FY 74	FY 75
Duration	⊢			⊣
$ Million	2.40	3.50	3.80	1.35

4. Coordination of Agency Services

Problem

There is too much overlap and duplication in vocational research, planning and program operation at local, State and Federal levels and among various agencies at the Federal level. This duplication is wasteful of both funds and effort and should be controlled and eventually eliminated.

Objectives

1. To analyze the present involvement of various agencies in vocational education research, planning and program operation.

2. To determine areas of wasteful duplication.

3. To design a system of complementary relationships and concerted services at appropriate administrative levels for the involved agencies.

Strategy

Employ survey research followed by developmental efforts.

(1) The analysis of agencies will involve an examination of the enabling legislation as well as operational programs and policies. The analysis of legislation would reveal the legislative framework within which the "overlap" occurs. The analysis will be conducted by an independent contractor, since it is conceivable that the discovery of involved agency overlap could result in a display of agency conflict and vested interest. Because the task is reasonably well defined, the relationship with the contractor should be through the "RFP" structure.

The agencies will be asked by the independent contractor to describe their operating procedures.

(2) The information gathered above would describe the overlap of the agencies.

(3) Models to eliminate wasteful duplication will be created by the scholars familiar with governmental activity. Because of the potential vested interests mentioned earlier and because of the typical understaffing of government agencies with the commensurate leadership overload, the results of an interagency study conducted by scholars of government will be presented to the agency leaders for approval and then trial.

Schedule and Cost

Year	FY 72	Fy 73	FY 74	FY 75
Duration				
$ Million	.15	.33	.15	.10

5. Relating Academic and Occupational Programs

Problem

There is a lack of articulation between academic and occupational programs, especially at the secondary level. The need for a complimentary relationship is not even well understood.

As a result, the vocational program, which should provide vocational guidance and orientation for all students and which should contribute to the preparation of the 80 percent of the population to enter the "less than baccalaureate" world of work, is relegated to a lower priority than the academic program in terms of both prestige and funding. Students are aware of the prestige differential and many who could profit most from vocational preparation choose instead the academic and eventually enter the labor market without the training necessary to be hired as skilled workers.

Objectives

1. To analyze vocational and general education to discover points at which they can enhance each other.

2. To develop a system of relationships that converts the potential enhancing relationships into reality.

3. To demonstrate the system.

Strategy

The strategy involves (1) an extension of the analysis of vocational curriculum skills to include the general school curriculum skills, (2) discovery of a set of relationships between the skill sets that will be perceived as increasing student attainment of all the skills required, and (3) testing and revising the model relationships in a working demonstration.

(1) Discrepancies between skills and knowledge in the current curriculum and those required in daily life will be found by (a) surveying a sample of graduates and (b) observing graduates to determine discrepancies between skills learned and life requirements.

(2) Models to eliminate wasteful duplication but to create desirable overlap will be created by scholars familiar with the design of educational programs.

(3) A network of schools will be chosen for testing the model for the articulation of academic and occupational curricula.

Schedule and Cost

Year	FY 72	FY 73	FY 74	FY 75
Duration	⊢			⊣
$ Million	3.75	3.05	3.00	2.00

6. Guiding Students into Vocational Curricula

Problem

Guidance personnel need additional information about what student characteristics are related to success and satisfaction in various occupational preparation programs and empirically validated systems for using the information in a guidance situation.

Objectives

1. To identify the factors that lead to student success and satisfaction in specific vocational programs.

2. To develop guidance procedures for helping students select programs in which they will experience success and satisfaction.

3. To demonstrate the guidance procedures.

Strategy

The strategy involves (1) differentiating the characteristics of students who succeed and continue in selected vocational curricula from the characteristics of students who either fail to perform satisfactorily or choose to drop out, (2) generating techniques counselors can use in guiding students into programs where their success chances are high and (3) displaying the successful guidance techniques in operating settings where they can be observed and adopted by vocational counselors.

(1) Sponsor a series of case studies of successful and unsuccessful students to generate hypotheses for investigation in a broader survey. Choose distinctive curricula to maximize the chance of finding clear dichotomies in the student data.

(2) Sponsor the generation of diverse guidance techniques ranging from the use of written career descriptions through group guidance by successful and unsuccessful students to trial study in the curricula themselves.

(3) Arrange demonstrations in a variety of school settings.

Schedule and Cost

Year	FY 72	FY 73	FY 74	FY 75
Duration	⊢			⊣
$ Million	.85	1.80	1.50	1.50

7. Retaining Students in Training

Problem

Guidance personnel have no firm information about what motivates students to stay in or drop out of occupational programs.

Objectives

1. To determine those factors, both within and outside the program, which students find to be rewarding.

2. To develop systems for delivering the desired rewards in the occupational program in such a way that students will find it desirable to participate and to learn.

3. To display the reward systems in demonstration programs.

Strategy

The strategies involve (1) assessing student abilities, attitudes and motivation and developing models to describe the influence of pupil attitudes on vocational study, (2) structuring a system which will create and reinforce positive motivation, (3) testing and demonstrating the motivation reinforcement approaches.

(1) Student attitude and motivation are a function of students' experiences and their perceptions of vocational education. To identify those experiences and perceptions involves a counterbalanced research design using stratified random sampling and sensitive assessment instruments. Because the research task is capable of exact definition and the skills required are available (though in short supply), the RFP approach will be used for research design and execution.

(2) Influencing attitudes requires changes in interpersonal or intergroup communication. This in turn requires a change in the behavior of the communicators. A set of alternative theory-based models will be generated and tested in a variety of settings so that the local user can select the most appropriate for his environment. The structuring of the environment to reinforce positive motivation involves manipulating the pupil environment, the teacher-student environment, the physical environment, and the curriculum. All four of the environments interact with each other and influence student motivation. Therefore, it is recommended that the development be conducted in one of the experimental network schools mentioned earlier. The contractor providing the models should conduct the development

(3) A network of schools and related agencies will be selected for demonstrating the restructured environments.

Schedule and Cost

Year	FY 72	FY 73	FY 74	FY 75
Duration	⊢			⊣
$ Million	.25	.53	1.10	1.30

8. Matching Students and Careers

Problem

Guidance personnel need additional information that relates job success to students' characteristics, and they need empirically validated methods and systems for helping students identify careers in which they can experience success and satisfaction.

Objectives

1. To identify skills related to job success.

2. To identify salient student characteristics and attitudes related to job success.

3. To develop methods of using the information in helping students make career choices.

4. To demonstrate the methods.

Strategy

The strategy involves (1) identifying skill and non-skill indicators that identify success in specified job clusters, (2) identifying student characteristics and attitudes that are valid predictors of the success indicators, (3) developing practical systems of communicating the information to students and (4) demonstrating how the findings can be used in curriculum and school management systems.

(1) The identification of success indicators will be accomplished mainly through compiling information already collected by the Department of Labor. It may also be necessary to collect some additional information about certain occupations by interviewing random samples of practitioners.

(2) Student characteristics and attitudes predictive of the success indicators will be identified by collecting student information early and conducting a longitudinal study to determine its relationship with the success of those students. This has already been undertaken in part through the USOE sponsored PROJECT TALENT. However, such longitudinal studies need to be frequently repeated due to changes in the economy. This ultimately makes the most accurate information available.

In addition an analysis of record keeping systems will be conducted to determine a common body of knowledge about students who are now employed in various occupational clusters. That information will be correlated with the results of the success indicators.

The subproblems being addressed are crucial and the double approach is justified in terms of the urgency and importance of the task.

(3) To use the information in helping students to make career choices requires the development of varied methods of communication. Models of these methods, based in theory, will be produced to apply to diverse situations as appropriate.

(4) These alternative models will be demonstrated in a sampling of schools and related agencies selected for that purpose.

Schedule and Cost

Year	FY 72	FY 73	FY 74	FY 75
Duration	⊢			⊣
$ Million	.25	.80	.95	.90

Five-Year Budget Projections
in $ Millions

Vocational Education

Problem Area	1972	1973	1974	1975	1976	5 Year Total
1. Manpower and Job Information	.35	.90	.65	.80		2.70
2. Curricula for New Occupations	3.65	7.00	8.70	10.50		29.85
3. Program Management Systems	2.40	3.50	3.80	1.35		11.05
4. Coordinating Agency Services	.15	.33	.15	.10		.73
5. Academic and Occupational Curricula	1.75	3.05	3.00	2.00		9.80
6. Guiding Students into Jobs	.85	1.80	1.50	1.50		5.65
7. Retaining Students in Training	.25	.53	1.10	1.30		3.18
8. Matching Students and Careers	.25	.80	.95	.90		2.90
	9.65	17.91	19.85	18.45		65.86

THE ORGANIZATION AND ADMINISTRATION OF ELEMENTARY AND SECONDARY SCHOOLS

USOE CER Research and Development Plans for FY 72-76

Just as at other critical junctures in our national history, the schools are once again asked to become the instruments of social change. At one time it was the assimilation of immigrant waves of population; at a later time it was educating those young people who could not be absorbed into the stagnant job market of the 1930's; now it is the education of disadvantaged minorities so that their long-delayed entry into the economic and social mainstream of the nation can be evolutionary and orderly. This obligation is added to others long carried by the schools but often poorly met: the obligations to transmit the values of our national life, to develop the full mental and social and physical potential of every student, to graduate men who are productive as workers and effective as citizens, to start every student on a learning pathway that will be lifelong.

Poorly organized and unimaginatively administered even to meet their traditional obligations, the schools today find themselves with a structure and a set of institutional habits which cannot serve for their new obligations.

Problems in the Organization and Administration of the Schools

Retaining a structure left over from the days when mass instruction in simple skills produced people who knew enough for their times, elementary and secondary schools have changed little in form since the one-room school gave way to the graded school with different teachers for different subjects in the secondary years. The multi-purpose teacher still works alone in a multi-purpose classroom in most schools. Her job is an unanalyzed lump of work, containing unidentified special tasks which might be better done by as-yet-uninvented specialists.

The weak scientific underpinnings for educational practice mean that even today planning and decision-making are grounded on folk wisdom and personal preferences. Moreover, the decisions are backed up by so little information--even about the internal workings of the school itself--that their effects can be neither predicted beforehand nor determined afterwards.

The system has been more concerned with maintaining itself than with improving itself. Almost no school has good procedures for inventing or searching out better practices and there are no strong networks linking schools to agencies which might help them.

Administrators are now being trained to keep the present system in operation. And they are being trained in programs which are as imaginative, as well-researched, as carefully planned, and as improvement-minded as the schools themselves.

Every effort to improve the schools--to let every child exercise his right to read, to give him a strong early start in learning, to open up better

occupational curricula for him, whatever it is--can be frustrated by organizational rigidity and administrative inaction in the schools. From this fact, CER derives its goal for research and development in school organization and administration.

General Goal

CER intends to conduct research and development leading to a revitalized school system 1) whose structures and practices are increasingly based on knowledge, 2) whose concern has shifted from maintaining itself to improving itself, and 3) whose posture before all its clients is one of accountability for performance.

Focus on Local School Districts

The system of schools can be studied and improvement attempted at a number of levels. CER will focus attention at the local level, looking "outward" or "upward" from classroom, school, and school district organization to state, regional, and national structures. There are several reasons for this:

1) School organization and administration affect teaching and learning most directly and most powerfully at the local level.

2) The remainder of the system should be organized to support the local level, where learning is expected to occur.

3) The web of social, economic, and political forces is simplest at the local level and the degree of discretionary authority enjoyed by local officials, while circumscribed in many ways, exceeds that of higher officials.

4) The local level has the greatest potential for adaptive, innovative activities.

5) Small scale experiments and pilot trials can be arranged in a few local units before any effort is made to modify the encircling administrative rings.

Criteria for Choosing Objectives

Midway in developing this plan, CER had 36 major objectives under consideration. All seemed worthwhile. About half were for short-term research and development products to satisfy immediate demands, such as new screening devices for selecting school administrators. The other half were for long-term research and development products which could remake the basic system, such as developing and testing new information systems for gathering, synthesizing and transmitting facts to guide management decisions. The final plan has reduced the 36 objectives to 10, some short-term and some long-term, using the following criteria:

1) Available Knowledge. Enough is now known to underpin a focused research and development effort with reasonable certainty of a usable product within a limited time. Where CER plans to create

theoretical models of an educational process, there has been enough experience with such models in other fields to give reasonable assurance that suitable ones can be developed for education.

2) Available Talent. Sufficient professional talent is available to perform the required work.

3) Significance. Achieving the objective will help schools become more rational, accountable, and self-renewing.

4) Impact on Schools. The resulting product will be either directly applicable to school practice or is needed to support further research and development which will be. General contributions to knowledge which imply nothing for school organization and administration will not be supported in the CER Directed Research Program.

5) Cost/Benefit Relationship. Achieving the objective will produce substantial benefits in the operation of schools at relatively low research and development costs.

6) Public Acceptability. The objectives may lead to changes which will not be well received by particular vested interest groups but each change will meet the generally accepted norms of the society.

CER has systematically excluded from this portion of its Directed Research Program all aspects of school finance in the expectation that those matters will be covered by the new Presidential commission on school finance as part of its investigations.

A Linked Set of Objectives

The 10 objectives chosen by CER constitute an interconnected cluster. Achieving any one will help achieve the others and failing to accomplish any one will lessen the chances of accomplishing the remainder. The connections among the objectives are so numerous that no sequential list does justice to all the subclusters. The following arrangement is simply one way of listing the objectives:

1. Educational and Social Demands on the Schools

   CER will take a deep reading of what a sample of the American people in a few major cities and surrounding areas expect of elementary and secondary education. The results will inform decision-makers as to what various publics want the schools to accomplish, help them to make better plans and decisions, suggest innovations, and perhaps even contain implications as to how the schools should be organized.

2. Alternative Organizational Forms

   CER will identify, analyze, and publicize several dramatic alternatives to traditional school organization which could make

schools not only more effective for the present but also more responsive to new public expectations as they arise. The new forms have the potential for making education less costly as well.

3. New Sets of Jobs for School Personnel

CER will develop and test new divisions of labor for schools, generating several patterns for organizing the work of professionals, paraprofessionals, and nonprofessionals. New sets of roles would be designed for the new school organizational forms identified by CER as well as for the established forms. Just as the forms suggest new roles, new divisions of labor will in turn suggest better organizational forms.

4. Management Information Systems

CER will develop management information systems using data processing equipment to collect, store, cumulate and present the kind of continuous information flows needed to guide administrative decisions in schools which keep on changing.

5. Models for Planning

CER will develop and test models of the process which should occur in educational planning, models which are capable of handling the complexity of that process but which are simple enough to suggest general designs for planning systems which might be used in the real world of ordinary school administrators. These planning models will be linked to and are expected to overlap the decision-making models described below.

6. Models for Rational Decision-Making

CER will develop and test models of educational decision-making, which begins with planning but goes far beyond it. The models will be specifically designed for an institution staffed by professionals, serving a clientele actively interested in influencing the decisions made, and seeking outcomes over which it has only limited control.

7. Procedures for Managing Innovation

CER will develop and test procedures schools can use to make innovation a normal, orderly, and successful part of their operation. It is assumed that the models of rational planning processes developed by CER will stipulate continuous innovation and that the models of decision-making will devote considerable attention to selecting, installing, and evaluating innovations. These models will lead to better procedures for managing innovation after about FY 75 than CER can generate in FY 72.

8. Linking School Districts to State Education Departments

State education departments straddle all the roads leading to the schools. Thus CER will devise and demonstrate new patterns of state-local relations which will bring state authority and state leadership into play to make local districts over into the kind of rational, self-renewing, accountable institutions envisioned here. Without this, the better organizational structures and management practices generated by CER's research and development program in school administration will never reach the local level.

9. Linking Schools and State Education Agencies to Research and Development Agencies

CER will develop alternative patterns which could be used to connect agencies such as universities, Research and Development Centers and Regional Educational Laboratories which produce knowledge and invent practice to agencies such as state education departments, intermediate units, and local schools which use knowledge and practice.

The patterns conceived will ultimately be designed into operating channels for the transmission of knowledge and practice and tested for possible use in an eventual national network of such channels. Such a latticework for the flow of knowledge and tested practice must surround local schools if they are to become informed users of research-based information.

10. New Programs for Training School Administrators

CER will develop and test new materials and new methods for training school administrators to be client-concerned, output-oriented, assessment-minded, and accountability-conscious. The research and development products CER will generate throughout this program will become part of the training content. Without men trained to use CER products, there is no hope whatever that CER's program in school administration will affect the schools.

General Strategy

CER takes the position that it is not necessary to wait for a complete body of knowledge to be created through basic research before school organization and administration can be improved. Fundamental knowledge about human beings and their interaction in organizations is produced slowly over long periods of time. And contributions to this fundamental knowledge are generally within the domain of the social science disciplines rather than the professional field of education. In its Fundamental Research Program, CER is taking new steps to attract social scientists to investigate matters which are basic to education. While that Program will depend on unsolicited proposals in the investigator's area of interest, CER will be alert to any which would probe into the phenomena shaping the structure and influencing the management of schools.

Meanwhile, the need for better school organization and administration has become quite serious. It is commonplace for professional leaders to make statements of this order: "Traditional school organization is finished--obsolete, unworkable, useless. It must be replaced without delay."

Fortunately, enough knowledge has already been and is now being generated --some of it under past USOE Bureau of Research sponsorship and some with current CER support--to underpin the invention of better organizational forms and administrative practices. Thus many of CER's objectives are to "develop" the needed inventions, doing whatever concomitant research is required in the process.

It has been CER's experience in operating the Research and Development Centers and the Regional Educational Laboratories that the most direct way to relate research to practice is to begin with development. By stipulating a practical problem to be solved and starting to contrive a solution for it, the developer finds gaps in the knowledge he is using and can pinpoint needed research. The research performed to fill such a gap--or the research located to fill it--is assured of almost immediate use. This experience makes CER confident that a "development and research" strategy will often prove to be the best way for its research and development program to help solve the urgent problems in school organization and administration.

Not every strategy chosen by CER involves development, however. For some problems CER has selected a theoretical approach. Where the matters of concern are extremely complex and little understood, as is the case with patterns of decision-making for schools, CER will commission the creation of intellectual models which the researchers believe to be analogs of real situations. These models will be tested in situations contrived to demonstrate the operations called for in the models. The models can be refined to the point that they produce operations representative of real school decision-making, then modified further until they produce operations superior to those in real situations.

On the other hand, some problems selected by CER have already been solved in isolated settings and the strategy chosen by CER is to search and discover those settings through conducting a survey. In short, after considering alternatives in every case, CER has thoughtfully selected the appropriate strategy for solving each problem.

Periodic Review of Plan

CER priorities for this program have been established for FY 72, taking into account the problems which schools currently face. Like any set of priorities established for a given point in time, they may need to be amended as time passes. They should remain relatively stable for three to five years. However, as social conditions change, as some objectives are achieved, as new models give a better grasp of the phenomena at work, priorities should perhaps be changed. Thus this plan needs periodic review.

Detailed Plan for Each Problem Area

Following are the plans for each of the 10 selected problems.

1. Educational and Social Demands on the Schools

Problem

Schools in the United States have grown accustomed to insistent and competing requests for educational and social services of every description, but the quickened tempo of the past 15 years has now mounted to a pounding drumbeat of demands. Compensatory education, computer education, integrated education, preschool education, drug education, black education, sex education, environmental education, aesthetic education, occupational education, relevant education, and on and on. What were once competing demands are now conflicting demands, as the nation evidently cannot afford all it can imagine yet does not wish to forego anything.

A school which decides to add something to please one group may get more blame than praise from other groups. One possible response: immobility. Reject all demands; change nothing. To avoid such rigidity, school decision-makers need to know what constituency is behind each spokesman. What is expected by what group? What do they value enough to buy? What will they forego when funds run low?

Objective

To take a deep new reading of what a sample of the American people expect of elementary and secondary education, to identify the views of subgroups within that sample, to disseminate the results widely, and to make the instruments used available for local replications of the study.

Strategy

Commission the development of questionnaries and interview guides, the former for broad coverage and the latter for interpretative information in depth. Design the questionnaires with special attention to the priorities held by the people. Place the respondent in a simulated decision-making role, telling him how his choices might affect tax rates, the education of poverty children, the college chances of the graduates. Question respondents about the existing program as well as about alternative additions. Sponsor the use of the instruments in several major metropolitan areas with a small but carefully chosen cross-section of the population. Identify the opinions of subgroups classified by demographic setting, age, ethnic background and other salient characteristics. Publicize the results and make the instruments readily available for use by local school districts, state education agencies, and other organizations.

Schedule and Cost

Year	FY 72	FY 73	FY 74	FY 75	FY 76
Duration	———	———			
$ Millions	1.00				

2. Alternative Organizational Forms

Problem

Schools are poorly organized to provide the kind of instruction needed today. The traditional form of school organization emerged during the early stages of industrialization. It was designed to supply uniform instruction in basic skills at a minimum level of quality and a low per pupil cost to the mass of the population at a time when farming and simple factory work occupied most of the people. The graded school of the past, with its 10-month year, 5-hour day, 30-pupil classes, technologically primitive classrooms, undifferentiated staffing, and continuously talking teachers is still the American standard. Its form has been almost untouched by an occupational revolution that has spawned 40,000 kinds of jobs and stretched education out to the full length of a man's career, a technological revolution that is making the home match the school as an information center and machines match teachers as information transmitters, a social revolution that demands not equality of educational opportunity but equality of educational outcomes. The standard school is not organized to meet these non-standard conditions. Its form is an actual barrier to meeting them.

There are too few visible, widely-known, well-understood substitutes for present organizational forms.

Objective

To identify, analyze and make visible several dramatic alternatives to the customary way of organizing the education of students so that a vigorous consideration of options can begin.

Strategy

Survey, analyze thoroughly, and publicize 10 to 12 distinctive patterns for organizing instruction at the classroom, building, and school system levels. Search inner city, suburban, and rural locations for patterns already in use on a limited scale. Identify promising sites from existing literature and conduct site visits as well as collecting written information. Determine costs and advantages and disadvantages of various patterns. With the advice of an expert panel, design and publish a comprehensive source book describing the patterns in detail, compete with charts and photographs.

Some of the patterns will display changes within the standard school structure, as by operating instruction year-round or by eliminating mass teaching or by abandoning grade levels, while others will stand as complete substitutes for standard structures, as in the case of televised instruction or home-managed schooling for young children or credit by examination with no formal instruction at all.

Schedule and Cost

Year	FY 72	FY 73	FY 74	FY 75	FY 76
Duration	———	———			
$ Millions	.50				

3. New Sets of Jobs for School Personnel

Problem

Administrators and teachers have taken on so many different kinds of jobs that they have trouble doing any of them well. This severe "role overload" arises chiefly from the primitive division of labor in schools. As schools have absorbed new functions, the new duties have simply been picked up by superintendents, principals and teachers.

Job specialties have been very slow to emerge in education. It takes years for a new role such as paraprofessional classroom aide to be conceived, designed, tried, and widely used. Achieving state certification of the new role is a common problem.

While some distinctive roles have been created--guidance counselor, librarian, nurse, custodian, remedial reading teacher, supervisor--most schools boast a principal, two or three specialists, and 20 or 30 classroom teachers. The teachers prepare their classrooms, operate duplicating machines, telephone parents, conduct classes, write examinations, grade papers, select library books, supervise students, diagnose learning problems, counsel students, conduct assemblies, keep records, monitor cafeterias, and otherwise perform as if they had no help.

Other professions have learned to subdivide the work. A hospital is a study in diversity of jobs; a school is a study in uniformity. The result is an expensive blend of incompetent performance and wasted talent.

Objective

To develop and test alternative sets of mutually-supportive roles in education based on a rational division of labor. The sets of roles are to include new and redefined professional, paraprofessional, and non-professional activities and are to encompass administrative, instructional, non-instructional, and pupil-personnel service functions.

Strategy

Assign teams of system analysts and job analysts to schools of several different sizes and levels of spending to develop detailed descriptions of the work required in those schools. Instruct the teams to set aside completely the existing job pattern for performing the work. Simultaneously, set a parallel group of able school people to work thinking of tasks which need to be performed but are usually neglected. Merge the lists coming from the two groups, rank the tasks by complexity, cluster them into related groups and form them into sets of jobs.

Use the following two distinct approaches to defining each professional job. 1) Supplemented Professional Roles. Conceive of complete, unassisted professional roles, then remove and assign to others only those tasks which make the role overloaded, leaving in each case a professional worker supplemented by essential assistants. 2) Subdivided Professional Roles. Conceive of the full professional roles, then remove and assign to paraprofessionals or non-professionals every task they can perform, leaving only a central core of irreducible professional behavior. In using each

approach, first assume a low-technology school environment and develop jobs for it, then assume a high-technology environment replete with sophisticated materials and equipment and develop jobs for it.

Create experimental school settings in conjunction with the new USOE Experimental Schools Program and make full-scale operational tests of the resulting sets of roles.

Schedule and Cost

Year	FY 72	FY 73	FY 74	FY 75	FY 76
Duration	———	———	———	———	
$ Millions	.50	.75	1.00	.50	

4. Management Information Systems

Problem

Schools operate on a layer of management information so thin that many decisions break through and become grounded on ignorance rather than on fact. The problem has long been serious, but the increasing complexity of schools and the volume of data which needs to be considered in arriving at educational decisions are making the problem critical. Adequate information is essential for rational planning and secure decision-making.

While schools lack much of the information they should have, administrators can seldom lay their hands readily on the information already on file. Moreover, the data which do exist are seldom available in cumulative form, synthesized and organized to guide the laying of plans and the making of decisions to carry them out.

Objective

To develop new automated management information systems for gathering, storing, cumulating, synthesizing and presenting information essential for administrative planning and decision-making in schools undergoing continuous change.

Strategy

Taking advantage of past and current USOE investments, some made by CER itself, examine the partly-developed systems now in existence and support the extension and completion of those which are highly promising. Building on CER products and designs arising from the entire research and development program in school organization and administration, make fresh analyses of the information needs those rebuilt schools will have and support the development of wholly new systems for handling information flow in them.

In designing systems, plot out what kinds of data will be needed--statistical and non-statistical, current and historical, for individuals and for groups, raw and processed. Assume several kinds of users--administrators, school board members, teachers, pupils, the public. Determine frequency of reports--daily, weekly, monthly, annually or otherwise. Work out suitable presentation formats for supplying diverse data to various audiences.

Create systems operable with simple technology as well as systems requiring complex technology. Compute the costs of various configurations of equipment, assuming several levels of data input and report output.

Schedule and Cost

Year	FY 72	FY 73	FY 74	FY 75	FY 76
Duration	———				———
$ Millions	.50	1.00	1.00	1.00	1.00

5. Models for Planning

Problem

Planning is a primitive art in most schools. Except for pupil enrollment projections and the scheduling of construction, planning rarely runs a full year ahead of events. Planning technique is limited to simple linear extrapolation and the use of formulas to compute needs: 100 more students equals 3 new teachers; next year's budget equals this year's budget plus 8 per cent for salary raises and other rising costs; 5 school buses become 7 years old and thus need to be replaced; the maintenance schedule calls for the auditorium to be painted every 10 years, and so on. Least planned is the instructional program itself; next year is assumed to be a photocopy of this year.

School plans are always expressed in terms of inputs to be manipulated or processes to be employed--never in terms of outputs to be achieved. Alternatives are not generated, priced, and judged in terms of their probable effect except in rare instances.

Few schools have planning techniques for coping with real shifts in the social setting: erosion of the tax base, the arrival of bi-lingual students, rising teacher militancy, or the sale of drugs on campus. Emergency plans--to handle violence, for example--are outdated or nonexistent.

The consequence is a future that is forever surprising to the schools and a management style that oscillates between handling matters routinely at one moment and coping with unexpected crises at the next.

Objective

To develop and test new models for planning in education, models capable of handling the ingredients of instructional program planning as well as the many other components of the enterprise. The intention is to develop models which have enough scope to handle complex information, enough reach to extend into the future, and enough flexibility to generate alternative ways of coping with it.

Strategy

Single out planning for specific attention. Although planning is one component of several program planning and budgeting systems for education now under development with USOE support and otherwise, CER believes that planning for education is a process so poorly understood that basic intellectual problems must be solved before a fully adequate operating system can be built. Thus CER will generate new models of the planning process even while practical administrative planning systems are already coming off the drawing boards and moving into pilot tests.

Commission social scientists who have developed theoretical models of complex social processes, such as movements in the economy, to adapt those models to education. Commission experts in educational planning and operations research to originate models of educational institutions and processes. Once constructed, those models will be tested for their ability to manipulate simulated educational data and to produce hypothetical probable futures

and possible plans for those futures. Skilled administrators will be convened to judge the realism of the simulated futures and the practicality of the simulated plans. Models which can handle artificial data competently will be used to manipulate real data, with the results employed by administrators in several actual school settings to determine their usefulness in daily operation of the schools.

Schedule and Cost

Year	FY 72	FY 73	FY 74	FY 75	FY 76
Duration					
$ Millions	.20	.30	.50	.50	

6. Models for Rational Decision-Making

Problem

Few school systems have an authority structure that permits the making of rational decisions throughout the institution. A bureaucratic administrative structure with a pyramid of apparently firm authority is overlaid upon a professional staff which expects a collegial system of self-governance but is moving rapidly into collective negotiation and centralized power.

The locus of authority for specific decisions is often unclear. Even when clear it may seem misplaced, as when the choice of specific textbooks is made not by individual teachers from week to week but by distant administrative officers, sometimes at the state capitol, years in advance. Moreover an allocation of authority does not necessarily require responsible performance in return. Teachers, for example, exercise almost total control over their own classroom techniques but are not held accountable when students do not learn, perhaps because they do not control admission to their classes.

Associated with the poorly conceived authority structure is a set of poorly developed techniques for making decisions. A faculty assembles in late afternoon for desultory discussion and votes to eliminate instrumental music instruction during class hours to stop class interruptions; the school board visits a school in the next county for ideas on how to design a new building; the superintendent drops a junior high sex education course when an influential parent complains; the teachers' union negotiates a salary budget that swallows up next year's instructional equipment line; in faculty council, senatorial courtesy requires the continuation of a new math course after enthusiastic testimony by the person teaching it.

Standing shoulder to shoulder with the schools in many large cities are units of the municipal government which control their finances and construction schedule. Surrounding all school systems are their state governments, which exercise degrees of power over most local decisions.

One new problem is the demands of militant students and poverty parents for a share of the power. Often unable to locate the sources of authority when they find the schools unresponsive to their requests, they have begun seeking seats at the council table.

Finally, rational decision-making is made doubly difficult by the fact that learning, the intended result of formal education, is affected by many powerful forces such as a child's home life which are beyond the control of the school.

Objective

To develop and test new models for decision-making in education, models which take account of decision sources external to the school, construct an authority system suitable for a professional staff, make authority commensurate with responsibility, and contain decision procedures appropriate for a social institution where outcomes are not under the sole control of those in charge but are strongly influenced by outside events.

Strategy

Commission social scientists who have made deep studies of educational institutions to create alternative models of authority systems and decision processes for governing schools. The models will be examined by experienced practitioners for their apparent fit to the realities of school governance. Models which are judged accurate and promising will be used to generate specific authority patterns and decision processes for simulated settings. The patterns will be systematically varied by manipulating components of the model. Distinctive arrangements will be experimentally tested in field settings.

Several satisfactory but contrasting forms of governance will be produced, each one capable of guiding rational decisions for the schools. Patterns will be developed for the new organizational forms which CER is creating for the schools in this program as well as for traditional organizations.

Schedule and Cost

Year	FY 72	FY 73	FY 74	FY 75	FY 76
Duration					
$ Millions	.80	1.10	1.30	1.50	1.50

7. Procedures for Managing Innovation

Problem

Schools are poorly equipped for managing innovation. Few systematic procedures exist for determining local needs, scanning available innovations, considering their probable fit, estimating their effect on other components of the system if adopted, arranging their installation, modifying them if necessary, evaluating their effect, and maintaining the successful ones. As a result, local needs are dimly understood, knowledge of innovations is fragmentary, selection and rejection decisions are poorly informed, dislocations in other school functions are commonplace during adoption, implementation is routinized and simplistic, reception is zealous or hostile, assessment is limited and impressionistic, and continuation is uncertain.

The consequence is stagnation punctuated occasionally by an innovative lurch forward, followed as often as not by a quiet slide backward into somnolence. Outside agencies which bring innovations to the attention of the schools, whether through the limited routes which exist or the better ones CER intends to open up, cannot do more than acquaint schools with the possibilities. The schools must match outside initiative with internal alertness, be able to judge the innovations offerred, and be able to manage an elaborate process of internal change, calling for outside help whenever necessary.

Objective

To develop and test procedures for local schools to use in identifying, judging, installing, evaluating, and establishing innovations. The objective is to develop procedures with which schools can make innovation a normal, orderly, successful part of their regular operation.

Strategy

Support a series of field-based projects in which local school systems, paired with outside agencies knowledgeable about innovation, develop alternative procedures for accomplishing one or more phases of the innovation process. Test and refine those procedures through successive use over a period of three to five years. The schools, the outside agencies, the kinds of innovation and the phases of the innovation process will be so chosen that tested alternatives will become available for every kind of school system--large or small, rich or poor, urban or rural--to manage every phase of every major type of innovation, be it a change in subject content, instructional methods, application of technology or drawing student attendance areas. Different procedures will be created for innovations that have been thoroughly tested outside and for those that are untested or are originated locally.

The result will be a diverse collection of tested procedures for locating, installing, assessing, and maintaining innovations.

Schedule and Cost

Year	FY 72	FY 73	FY 74	FY 75	FY 76
Duration	———	———	———	———	———
$ Millions	1.25	1.50	1.50	1.00	.50

8. Linking School Districts to State Education Departments

Problem

Although they are units of state government under the administrative supervision of their respective state education departments, local school districts are not well linked to those state departments except for their most routine operations. While some departments regulate the operation of local schools fairly firmly and others provide useful though limited services, few departments offer effective leadership, especially with respect to innovation. Departments are not research and development organizations and they are usually disconnected from the research and development performed elsewhere, a condition which has been alleviated but not eliminated by ESEA Title V.

Although some states have a set of intermediate administrative units blanketing local school districts, most of those units are as underfinanced and understaffed as the state departments themselves. Even the introduction of the new ESEA Title III units in recent years has not shortened the distance from the local superintendent to the state commissioner in most states.

The growing pattern of Federal block grants of money to be allocated to school districts at state discretion increases the need for good linkages between states and localities so that state departments become more than thoughtless conduits for these federal funds.

Objective

To devise, test and demonstrate new patterns of state-local relations which will increase state leadership in seeing that local schools use better planning techniques, base their decisions on evidence, institute good procedures for managing innovation, and modify their organizational forms when better patterns are invented. State leadership will of course have to be accompanied by altered state regulations and by the thoughtful allocation of state and federal funds to advance schools along the road.

Strategy

Proceed in three steps: 1) Examine, from the standpoint of all types of local school districts in all sizes of states with all types of state agencies, what kinds of activities state departments should perform either directly or through intermediate units, particularly as they administer federal block grants; 2) create and assess in 5 to 10 locations new forms of state-local linkage and state leadership, as for example in state-led exploration of performance contracting between local districts and outside agencies, employing arrangements which could be continued by the use of block grants; 3) install and demonstrate successful patterns in 10 to 15 states of all types scattered throughout the major regions of the country, having the states use block grant funds to pay the operating costs.

Schedule and Cost

Year	FY 72	FY 73	FY 74	FY 75	FY 76
Duration	←	—	—	→	
$ Millions	.50	.75	1.00	.50	

9. Linking Schools and State Education Departments to Research and Development Agencies

Problem

There is no national network and there are no regional networks for schools to use in communicating with knowledge-producing agencies such as universities, Research and Development Centers, and Regional Educational Laboratories so that the schools can base changes in practice on firm knowledge. Although certain structural components of a possible network do exist--the USOE ERIC system, ESEA Title III centers, state education departments and their intermediate units, professional associations, and affiliated clusters of local school systems--no genuine network exists even for the orderly transmission of information, much less for the actual transmission of improved practice. The result is that the familiar complaint about research results remaining unused on the shelf (a condition considerably alleviated by the creation of ERIC, the R & D Centers, and the Regional Educational Laboratories) can be supplemented by the complaint that valuable practice goes undemonstrated and undisseminated for lack of channels that can carry knowledge and practice.

There is at present no substantial, thoroughly worked out conception of what such a national network should look like, although USOE has given thought to next steps for ERIC and has created a new Office of Information Dissemination to further the spread of knowledge and practice.

Objective

Create alternative designs for a nationwide pattern of linkages between agencies such as universities, R & D Centers, and Regional Educational Laboratories which produce knowledge and invent practice and the schools, which need that knowledge and practice in order to improve their operations. The designs should include all major organizations, such as professional associations, which can constitute channels in the network, but should give particular attention to state education departments since they can serve as channels but also can exert authority over local programs.

Strategy

Stimulate competetive proposals for networks covering at least a single state. Solicit plans from all types of agencies which might serve linking roles. Have proposals reviewed by major representatives of knowledge and practice producers on one hand and major users of knowledge and practice on the other. Pilot test those plans which are judged promising. For those that succeed, solicit proposals for expanding them to integrate all significant organizations into the network.

Schedule and Cost

Year	FY 72	FY 73	FY 74	FY 75	FY 76
Duration	←	—	→		
$ Millions	.50	1.00	1.00		

10. New Programs for Training School Administrators

Problem

Traditional training programs for school administrators are based on an anachronistic view of the educational system. They assume a school which is stable in character while growing in enrollment when in fact the reverse is true today: stability in enrollment and the need for drastic changes in the character of the school.

Although there are several hundred preparation programs for prospective administrators, none is yet capable of training them to use the best scientific management methods that now exist and the new ones being developed. And although there are hundreds of training experiences for administrators already in service, most administrators in the nation's 20,000 school districts are not reached and few programs cut deep enough to change the administrative behavior of those who are reached.

CER's research and development program outlined in the nine problem areas discussed above will have little eventual effect on the schools unless accompanied by an aggressive program to reform administrative training so that school leaders are able to operate in the structures and master the procedures generated by CER.

Objective

To develop and test both new instructional materials and procedures and new institutional mechanisms for training both pre-service and in-service school administrators. The objective is to select new course content, design new instructional methods where necessary, and invent new systems for delivering the training which will be as carefully managed and as intelligently self-adjusting as the schools the trainees are to administer.

Administrators are to be trained for the several different roles needed to operate the new schools CER envisions--planning, using evidence to decide, handling volumes of information, managing innovation. They are to be trained as team members. They are to be made client-concerned, output-oriented, accountability-conscious, and assessment minded. They are to learn how to use management information systems which give continuous feedback to guide planning and decision-making. They are, in short, to be trained as managers of rational, self-renewing organizations.

Strategy

Request proposals for new content, methods, and materials from teams composed of experts in modern management methods from business as well as from universities, experts in school administration, and specialists in instructional technology. Make the completed materials available for immediate use in in-service as well as pre-service programs, working jointly with USOE's Bureau of Educational Personnel Development to demonstrate the materials through the Bureau's priority program for school administrators.

Request proposals for the design of distinctive new mechanisms for supplying pre-service training. Solicit these proposals from institutions willing to adopt and operate the new mechanisms they invent. When the designs are completed, support their experimental use and continue to support as demonstrations those which prove successful.

Schedule and Cost

Year	FY 72	FY 73	FY 74	FY 75	FY 76
Duration					
$ Millions	1.25	1.50	2.00	2.00	.75

Five-Year Budget Projections
in $ Millions

School Organization and Administration

Problem Area	1972	1973	1974	1975	1976	5 Year Total
1. Demands on the Schools	1.00					1.00
2. Organizational Forms	.50					.50
3. New Sets of Jobs	.50	.75	1.00	.50		2.75
4. Management Information	.50	1.00	1.00	1.00	1.00	4.50
5. Models for Planning	.20	.30	.50	.50		1.50
6. Models for Decision-Making	.80	1.10	1.30	1.50	1.50	6.20
7. Managing Innovation	1.25	1.50	1.50	1.00	.50	5.75
8. Linking Schools to States	.50	.75	1.00	.50		2.75
9. Linking Schools to R & D	.50	1.00	1.00			2.50
10. Training Administrators	1.25	1.50	2.00	2.00	.75	7.50
	7.00	7.90	9.30	7.00	3.75	34.95