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ABSTRACT

The program purpose of the Dissemination and Resources Group of the National Institute of Education is to improve dissemination and use of knowledge for solving educational problems and to study, evaluate, and improve the capabilities of institutions and individuals to produce and use knowledge in improving education. The principal strategies for the 1978 program are (1) increasing the understanding of the R&D (research and development) system especially the factors that shape present practices and the relationships between production and use of knowledge; (2) assuring full and effective access to the knowledge resources available; (3) building the capacity in education systems and institutions to disseminate and use knowledge; and (4) strengthening the linkages between the R&D and practice communities through dissemination activities involving State, local, and intermediate education agencies, R&D organizations, teaching institutions, and professional associations. (Approximately half of this report is devoted to discussion of the context of dissemination and utilization in education--the nature of the educational system and the nature of the knowledge resource base--and the role of the Federal government. The other half describes the four 1978 program strategies listed above. A bibliography is included.) (LAS)

# DISSEMINATION AND RESOURCES GROUP

# PROGRAM PLAN FY 1978



## AUGUST 1976

The National Institute of Education
U.S. Department of Health, Education and Welfare
Washington, D.C. 20208

CONTENTS

EXECUTIVE SUMMARY

Problem Statement

Schools and students have derived fewer benefits than they might from the knowledge and innovative practice produced through research and development. Information about newly created knowledge and improved instructional practice and materials does not generally reach teachers and administrators in a useful and timely fashion. Implementation of useful innovations lags. Improved communication and linkage between organizations serving educators in the field -- State, intermediate and local education agencies, teacher education institutions, professional associations -- and the research community is needed to speed the flow of new ideas into practice.

Program Purpose

To improve the dissemination and use of knowledge for solving educational problems, and to study, evaluate and improve the capabilities of institutions and individuals to produce and use knowledge in improving education.

Highlights of FY 1978 Budget

- Provide current data on the information needs of educators and on the impact of existing information products, services and R&D outcomes on users.
- Design and pilot test up to two new data bases in addition to or in conjunction with the Education Resources Information Center (ERIC) in areas not presently served adequately (e.g. education-related law and policy; promising school practices).
- Support a bilingual clearinghouse on educational R&D to serve the needs of the Hispanic communities.
- Continue to build dissemination capacity through support of up to 40 State agencies and modest support of other selected education organizations.
- Increase the emphasis on reaching those students who are poorly served by the education system through support of activities in big-city schools to identify and implement R&D-based solutions to education problems.
- Support a program providing training and technical assistance activities to increase participation by minority groups in knowledge production and utilization in education.

- o Initiate a program focusing on two sectors of the higher education community: assist community colleges in making better use of existing knowledge for the improvement of their instruction, and cooperate with teacher education institutions to improve their training of teachers and administrators in using knowledge.

- o Begin a field-initiated grants program supporting research that will illuminate the functions, roles, and standards operative in the processes of producing and using knowledge in education.

FY 1978 Program

The principal strategies of the Dissemination and Resources Group are:

1. increasing the understanding of the R&D system, especially the factors that shape present practices and the relationships between production and use of knowledge;

2. assuring full and effective access to the knowledge resources available;

3. building the capacity in education systems and institutions to disseminate and use knowledge; and

4. strengthening the linkages between the R&D and practice communities through dissemination activities involving State, local and intermediate education agencies, R&D organizations, teaching institutions, and professional associations.

A description of each strategy and related activities proposed for FY 1978 are presented below.

- o Understanding the R&D System

  This strategy is designed to respond to the Institute's legislative mandate to "build an effective R&D system." In order to address this mission, NIE must understand the nature of that system and how it functions. Much attention has been given to the development of appropriate methodology for research. While this work needs to continue, this strategy focuses on increasing the understanding and improving the performance of other related functions, such as development, dissemination, implementation, and utilization.

-- Program Activities

  - o Monitoring the Educational R&D System

  - o Sensing Information Needs in Education

  - o Feed Forward System on Impact of R&D and Needs for Future R&D

- o Research Grants Program
- o Development of Methodology for Knowledge Production and Utilization Functions
- o Study of Educational Practice
- o Research and Evaluations on DRG Programs

o Assuring Access to Knowledge Resources

Programs in this area are concerned with providing the education community with a wider range of knowledge resources about education and with making this expanded knowledge base more accessible and easier to use. Knowledge resources include the general type aimed at providing assistance in confronting a broad range of issues in education (e.g., ERIC) as well as the targeted type that provides information on specific topics (e.g., Interpretive Studies and Catalogs of R&D Products). ERIC will be continued, and its use and the availability of its resources will be increased. In addition to or in conjunction with ERIC, up to two new data bases in areas such as education-related law and promising school practices will be designed and pilot tested. Activities of a targeted nature will be designed to provide the education community with increased awareness, understanding, and access to R&D outcomes. These activities include the identification and cataloging of R&D outcomes and the development of interpretive analyses of how these outcomes can be used for practice improvement.

-- Program Activities

- o ERIC Continuation and Improvements
- o Development of New Data Bases
- o Bilingual Clearinghouse
- o Information on R&D Outcomes

o Building Capacity in the Education System

One important key to increasing dissemination capacity within the system is the State education agency, both because it is the level of Government constitutionally responsible for education, and because State agencies have more and more moved into a service role with respect to their client school systems. The current State dissemination program, to be continued in FY 1978, is based on these considerations and upon the experience with the earlier pilot program.

FY 1976 saw the initiation of efforts to build dissemination capacity in settings other than State agencies when a program focusing on education associations began. In FY 1977 and 1978 these efforts will expand to include postsecondary institutions with emphasis on community colleges and teacher education institutions and large school systems. A program of training and technical assistance for minorities will be continued to increase their participation in the production, dissemination, and implementation of R&D in education.

-- Program Activities

- o State Dissemination Capacity Building
- o Capacity Building in Other Settings
- o Dissemination Leadership Program
- o Training in R&D Functions for Minorities

o Strengthening Linkages Between R&D and Practice

While the objective of improving linkages between the many components of the education and research communities is at the heart of most of the activities in DRG, this strategy is concerned specifically with linking research and practice in order to help education practitioners to identify, examine, and effectively implement R&D-based solutions to high-priority educational problems. Local, intermediate, and State education agencies, R&D organizations, and institutions of higher education work together to provide technical assistance to local schools. R&D organizations cooperate in providing client-oriented information describing available R&D products to schools and in assessing the impact of R&D on users. Complementing these activities aimed at improving linkage is a project that will coordinate and synthesize training materials for linking agents and conduct pilot training programs.

-- Program Activities

- o R&D Utilization Program
- o R&D Dissemination and Feed Forward System
- o Linking Agent Training Project

## Preview

The DRG program plan for FY 1978 is directed toward logical extension and improvement of a program structure designed over the past two years. It reflects a belief that effective production and use of knowledge and innovative practice for educational improvement must build on the resources and strengths of the country's education system and R&D communities. Largely through federal investment, considerable success has been achieved in the past ten or twelve years in increasing the capability for knowledge production: significant research and development activities have been sponsored, many useful products and findings have resulted, and institutions and individuals have become committed to R&D in education. However, if the payoff of these activities is to be realized through improved school programs, comparable work must be undertaken in supporting dissemination, implementation, and utilization activities. We need to build our knowledge about these functions and use it to build appropriate institutions, mechanisms, and services. Achieving lasting results that will show up in better education requires a continuing commitment over a period of years.

An effective program must appreciate the characteristics, realities, and constraints of American education and the supporting R&D structures. It must be based on the experience and the theoretical and empirical research in the appropriate fields (diffusion, communication, social interaction, etc.). It must seek to meet the congressional mandate to NIE through a careful selection of the strategies most likely to lead to long-term improvement. To that end, we are

- conducting research on the functioning of the R&D system, especially on the relationships between production and use of knowledge;
- creating better access to the knowledge resources available for the improvement of education;
- building the capacity in education systems and institutions (State, local, regional, professional societies, higher education) to disseminate and use knowledge; and
- fostering linkages between R&D and education practice to facilitate the effective use of R&D outcomes.

The four strategies together provide a program structure allowing coherent progress. Specific emphases in this budget cycle are on consolidating benefits from previous years, extending selected programs to increase the number and types of participants in the production and use of educational knowledge, and taking next steps for which the field is ready and that have been inhibited by limitation of funds in previous years.

## History

Education is an increasingly larger endeavor in our society. In the period 1930-1970, education's share of the Gross National Product more than doubled

(from 3.8 % to 7.7%); expenditures for educational R&D have increased along with the support for all R&D (all R&D has grown from .2% to 2.7% of the GNP between 1930-1970); new legislation and appropriations have focused on improving school practice through Federally supported educational R&D (see Figure 1). Accompanying this growth in R&D has been a concern that the newly created knowledge and instructional materials and methods were not having much of an impact. Studies confirmed that information about education research and exemplary practice was largely inaccessible and unused by the education professional.

This concern that the knowledge and innovative practice produced through R&D actually be used to improve American education predates the birth of NIE. The two agencies most active in educational R&D both recognized this problem in the early 60's and established general-focus programs to assist the spread and application of R&D results: OE started the Educational Resources Information Center (ERIC) in 1963 to identify, abstract, and make accessible research literature pertinent to education; NSF supported in-service training in the sciences to help teachers update their science instruction. Both OE and NSF moved to more targeted strategies in the mid and late 60's. OE created the Regional Laboratories and demonstration programs focusing on exemplary practice (e.g., Title III, Research Coordination Units in vocational education), and prepared reports on selected topics (Putting Research into Education Practice--PREP reports). NSF supported implementation projects concerned with specific science curricula. Congress also perceived the problem of lack of use of education R&D: at present there are 208 Federal statutes and regulations mandating dissemination of educational R&D, with responsibility ascribed to dozens of different types of agents (e.g., the President, Federal executive agencies, State Education Agencies, institutions of higher education, voluntary organizations). Only <u>one</u> of these statutes carries a specific appropriation with it, however.

The originating NIE legislation emphasizes that the purposes of the agency are to solve or alleviate education problems and improve education as an art, science, and profession. This mandate speaks to a widely perceived need: without application in the Nation's classrooms, the investment in educational R&D misses its target. The 1976 reauthorization language is likely to be even more specific in requiring NIE to carry out dissemination programs that will help teachers, administrators, and decision-makers institute improved educational programs.

## Understanding Dissemination and Utilization in Education

Why has dissemination and utilization of education R&D received so much attention--if few actual dollars--in Congress and the education community of late? With hindsight, it could now be said that experience in other R&D sectors should have led us to build in R&D transfer mechanisms from the start if we hoped for improvement in the operating education system. In fact, modification of mechanisms used in other sectors have been tried from time to time but they have had limited effect in the field of education.

The use of R&D in any sector takes place only in the presence of one or more of the following conditions: technology push, needs pull, and explicit linkages between R&D and the operating system. Technology push is effective when R&D generates products of high relative advantage that can be adopted

FIGURE 1

LEGISLATION AND APPROPRIATIONS FOR EDUCATIONAL R&D, 1954-1974

| | |
|---|---|
| 1954 | Cooperative Research Act establishes Federal role in educational R&D. |
| Late 50's | NSF begins R&D activity (accelerated by Sputnik after 1958) in science education. |
| 1958 | National Defense Act<br>o Title VI: Language development including R&D provision.<br>o Title VII: R&D and dissemination on new educational media. |
| 1961 | Under Cooperative Research authorizations: curriculum improvement in English, language arts, and social sciences. |
| 1963 | Vocational Education Act: development of projects to help students prepare for post-secondary careers.<br>Handicapped Education Act: research, development, and demonstration provision.<br>Under the Cooperative Research Act: establishment of the first R&D center program |
| 1965 | ESEA: a variety of educational programs including<br>o Title I providing educational support to disadvantaged children.<br>o Title III supporting development and dissemination of new educational methods.<br>o Title IV creating Educational Laboratories: authorized expanded research, development, dissemination, and training program for education researchers.<br>Higher Education Act: research on libraries and information services. |
| 1967 | Education Professions Development Act. |
| 1972 | Establishment of NIE as the lead agency in educational R&D |
| 1974 | Experimental projects in OE - discretionary R&D authority for OE apart from major titles. |

in numerous settings with little modification. It is generally true that in such cases there are also strong linkages between the R&D and operational systems which arise out of mutual concern; e.g., the airlines are the aerospace industry's best civilian customers and the industry's R&D helps keep the airlines competitive. Needs pull operates in sectors where problems are clearly defined and priorities agreed to, and where the requisite knowledge base exists. An example is the "man-on-the-moon" and associated NASA programs. Sometimes technology push and needs pull are combined as in weapons development and pharmaceutical R&D. Establishing explicit linkages becomes critical in areas where technology push and needs pull operate only weakly. The most frequently cited (and best studied) example of effective explicit linkage between R&D and practices is the agriculture extension service based on local agents with direct ties to the institutions performing most of the R&D. A rough indication of the investment needed for such linkage is the fact that in agriculture nearly 40¢ out of every R&D dollar is spent on dissemination. In education, it is less than 7¢.

Education is a public service industy. At its core is the nurture of human beings by other human beings. It is therefore unlikely that technology push in the form of automation will change schooling as it has in such service industries as communication and banking. On the other hand, needs pull also serves as a weak stimulant, given the complexity, decentralization, and diverse goals of American education. Hence, if R&D is to be used to improve education, the establishment of explicit linkages becomes critical. In this regard, an education extension system emulating the agricultural model has sometimes been suggested. But the creation of effective linkages in education, though it ought to take advantage of relevant strategies from other sectors such as agriculture, must be based on an understanding of the special characteristics of the education system.

Nature of the Education System

The following characteristics of American education have major import in developing effective links between R&D and educational practice.

1. Complexity. The education system consists of a diverse set of subsystems ranging from early childhood education through elementary, secondary, and higher education to adult education. While elementary, secondary, and higher education are highly institutionalized into organized systems, the early childhood and adult subsystems are not "systems" at all, but rather a heterogeneous group of public, private, licensed, non-licensed, voluntary, and ad hoc programs and institutions. Some observers have described the education system and institutions within it as organized anarchy. Though parts of the "system" and professions related to it are highly organized, decision-making power is diffused (both vertically and horizontally) through many governance structures and several governmental layers. Functions are overlapping. Individuals and communities count on the benefits of edcuation and are deeply interested in its contribution to their welfare. Therefore, oversight of education is not limited

to the formal governance mechanisms--court decisions, parent demands and dissatisfactions, community values, and the need of business and industry all impact on what happens in the classroom and on the way to it.

There is no single adminstrator or instructor in public education who can decide on a new way of organizing a school and then unilaterally establish such a school as a farmer can adopt contour ploughing, or who is able to teach a new moral education curriculum instead of traditional social studies as a farmer substitutes a new seed variety for the old.

2. Decentralization. Higher education has always been protective of its decentralization both within and among institutions. Each department develops its own methods for meeting the needs of its students. Adult education today is the product of successive ad hoc solutions to various demands for education services. In response to specific needs, adult education is sponsored by universities, the federal government, the armed forces, private industry, and private foundations. At the precollege level, the autonomy-- at least in principle-- of the local school system is intended to assure that the values of the community are embodied in what its children learn. Higher levels of government (State and Federal courts, Federal support programs) are active mainly to safeguard every child's rights to an education-- the handicapped, the poor, minorities, those interested in vocational education, etc. Conditions vary markedly from school to school, community to community, State to State. Value conflicts abound, leading to ambiguous, hard-to-implement, harder to measure goals. Yet expectations are high as to what schools should do for children and what education should do for the individual. Thus, throughout the education system the absence of unique solutions (technology push) combines with the absence of uniquely defined problems (needs pull) to emphasize *the critical role of appropriate and effective linkages between potentially useful R&D and locally identified needs.*

3. Size. The well known facts that education involves nearly a third of the populace, consumes nearly 8% of the GNP, is the biggest public industry next to defense, need not be rehearsed here. Relevant to the utilization of systematically developed information are the following numbers: in the public elementary and secondary school system alone, there are 2.5 million teachers and administrators, over 16,000 separate school districts, 80,000 school buildings, and over 100,000 individuals directly involved with governance as school board members and other policy-makers; in 1972 there were 2665 higher education institutions with 600,000 instructional staff; in 1970 there were over 53,000 licensed day care facilities and this excludes formal nursery schools, prekindergartens, and kindergarten programs; in 1972 there were an estimated 32 million adults participating in education. The sheer magnitude of the education system suggests that *dissemination activities must be*

*structured in a multi-level system; they must be designed in cooperation with those who carry the major burden of financing and staffing education systems and institutions, and they must build on and expand existing capacity in the many organizations and networks currently serving education.* No single agency along--certainly not the Federal government which contributes only 8% of the cost of elementary and secondary education -- can hope to mount, finance and run an effective dissemination/utilization system.

Nature of the Knowledge Resource Base*

Efforts to build effective R&D dissemination and utilization in education must also take into account the characteristics of the resource base.

1. Structure. Knowledge and practice that bear on any specific problem in education arise from many different sources, a critical difference from the well integrated agriculture R&D system. Research is structured -- and results reported -- in accordance with the diverse interests, needs, and methods characterizing each of many relevant academic disciplines; innovative practice can be developed through systematic procedures carried out by R&D organizations, by gifted teachers working in their own classrooms, or by subject matter experts outside the education system. Thus, the organization of substance, professional allegiance, and prevailing modes of communication serve to fragment information. Exchange of knowledge between fields or among different types of R&D producers is rudimentary; sharing of

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* We do not here address issues of quality, since-- except for a screening and assessment function -- other groups within NIE are charged with improving the knowledge feeding into the resource base.

information is even rarer between those who mainly produce R&D and those whose main responsibility is running educational institutions and systems. Attempts to alleviate these problems have led to a proliferation of information resources--newsletters, journals, seminars, films, etc.--that tend to create information overload. *The need for synthesizing, systematizing and organizing R&D knowledge and products into a coherent set of resources grows every year as R&D activity continues.*

2. Accessibility. Despite the creation of a variety of information resources, access to knowledge of use in specific situations is limited. There are many potential sources of R&D knowledge and products, few effective links, and little time on the part of busy teachers and administrators to engage on their own in systematic information searches. Therefore, people turn to the source they know best and is closest at hand - generally a trusted colleague within the same (or same type of) organization. Not surprisingly, studies show that educators feel they are information-poor, *a condition that is likely to continue unless better access is provided to existing resources and capacity for utilization is improved.*

3. Relevance. Given complex organizations, functions and roles within education and educational R&D on the one hand, and the general nature of the best information resources available on the other hand, there is often a problem in identifying those pieces of information that are most relevant to a specific purpose. The origins of much basic and applied research knowledge also tend to militate against utility to teachers, administrators and decision makers such as school board members and legislators, since results are reported through channels and in forms mainly of interest to fellow researchers, or perhaps developers.

   As to development products, school personnel often are asked to choose from alternatives that do not appear to fit local needs or conditions or from untested innovations lacking evidence on their effects. Few exemplary programs are currently screened against evaluation standards that provide useful guidance for local adoption. A similar lack of documented evidence applies to many R&D products. The situation is not so much indicative of the lack of alternatives (California, in a recent State adoption solicitation, received hundreds of reading curriculum submissions) as of the lack of systematically collated information on effectiveness, contextual characteristics in previous uses (nature of school systems, students, teachers, etc.), resources needed, teacher training required, and so forth. *If R&D is to be utilized, its results must be provided in a variety of well focused, useful forms specifically geared to teachers, administrators, policy-makers, parents, and other interested groups.*

4. Communication channels. Diffusion research examining information use in such clinical systems as medicine, mental health practice, penology, and education underscores the important role of person-to-person communication in effective transmission of new knowledge and improved practice. Current knowledge delivery mechanisms in education are

mainly designed around papers, articles, reports, books, and summaries. Such document-based information systems are important to create awareness and provide technical information, but *adoption and use of R&D outcomes and processes will require linking mechanisms which facilitate extensive person-to-person interchanges.*

5. Nature of knowledge base. Even if problems of access and relevance could be ameliorated and improved linkage be provided, there are two aspects of the knowledge base that make it a weaker tool for education improvement than R&D in other sectors. First, educational innovations, unlike technological products (drugs, hybrid seed, faster and greater-capacity airplanes), are not easily packaged and installed. They seldom behave as reliably. They tend to involve "people change," with all the attendant strain on individuals and organizations. Hence, implementation is difficult, and objectively demonstrable effects are hard to replicate. A second problem is the weakness of the scientific and technological base of education and educational R&D. Education shares this with other applied fields dealing with individual behavior and social organization. Not only is the knowledge base relatively weak in the prerequisite social sciences, but research in these fields must take account of value orientations, the inappropriateness of many standard experimental methods, and the need to protect human subjects.

   As a result, there should (and will) continue to be many solutions to educational problems rather than the sure cure--the infallible polio vaccine or the double-yield miracle rice. The consequence is that, *unless sophisticated but sensitive dissemination efforts are designed to facilitate matching and adapting solutions to settings and contexts where they will be optimally effective, the potential usefulness of R&D will continue to be underexploited in education.*

6. Participation. Minority group members are severely under-represented in the conduct of educational R&D. While they constitute 17% of the total population, they make up between 2-3% of the R&D work force. Minority investigators conduct less than 3% of the educational studies published or reported. As a consequence, the applicability and credibility of R&D with respect to education concerns of minority communities is low. Major problems exist in areas of problem identification, objectivity and theory dependency, methodologies, analyses and conclusions, and policy formulation. *These problems will persist until adequate participation by minority groups in all the knowledge production and utilization functions is assured.*

## Research on Dissemination/Utilization

Dissemination of R&D has been extensively studied, both in education and in other fields. A recent report claims that the current literature contains more than 3,000 publications on innovation and change. The empirical findings on knowledge-using behavior in education can be explained by the characteristics of the education system and of educational R&D noted briefly above. Some of these findings are critical to the design and implementation of effective dissemination/utilization programs. Broadly summarized, they are:

- Methods of seeking and using information vary greatly according to the user's role and specific need--behaviors range from occasional questions to colleagues through random browsing to highly purposeful searching of an organized information base.

- Practitioners prefer succinct, non-technical information and, if possible, first-hand observation.

- Redundance is an important factor in innovation. A single exposure to a new idea is rarely a sufficient stimulus for innovation. Potential users require repeated exposure to an innovative idea.

- Implementation of innovation occurs in relatively distinct (though not necessarily linear) stages often cited as need identification, awareness of potential solutions, trial, evaluation, adoption, implementation, and maintenance. A successful R&D utilization program must provide appropriate help for each of these stages.

- Several factors influence the speed with which new ideas are adopted. These include the characteristics of the adopter and adopting system, the characteristics of the innovation, and factors associated with the wider environment or context.

- People adopt improvements because the change is rewarding to them personally, to their group, or to their institution. Processes leading to successful innovation must have payoff value to all parties concerned.

- Educational innovations are seldom, if ever, implemented in their "pure" form. A process of mutual adaptation occurs in which both the innovation and the local situation undergo changes. If viewed as necessary and healthy, this process can deliberately be made to work for the desired improvement.

- Successful implementation requires early involvement of those to be affected and those who will share responsibility for carrying out the innovation.

- The most innovative schools make conscious arrangements to insure the use of new ideas; successful change seldom occurs haphazardly. Successful innovators do not all follow the same structure, but they all follow some structure.

- Outside thrusts (e.g., Federal interventions) last for only a limited period of time. Sustained follow-through and local ownership (both psychological and financial) are required for maintaining an innovation or a new capacity. Rapidly changing Federal priorities can be destructive in this regard, particularly in efforts requiring a stable, sustained commitment to building capacity in the field.

Theoretical work in the area of knowledge diffusion and R&D utilization has also been considerable. The empirical findings have been conceptualized from several different perspectives. The most often discussed are the communication models, the incentive-based perspective based on economic models, and the social process perspective including organizational development and conflict/confrontation models. Each focuses on different aspects of an operating system and its relationship to R&D. Therefore, each makes

different assumptions about the behavior of systems and individuals in them, their most critical characteristics, and appropriate strategies for introducing and implementing improvements.

The most fruitful perspective for the dissemination and utilization of knowledge in education is based on the three communication models: the research, development, dissemination and adoption model (RDDA); the problem-solving model; and the social interaction model. A perspective that integrates these three gives rise to the fourth, the linkage model. Though the models agree on the classes of factors important in knowledge dissemination and use, each focuses on a different set. The RDDA model puts stress on the R&D knowledge or product; the problem-solving model on the social system in which use occurs; and the social interaction model on communication processes within and between the R&D producer and the R&D user systems. The linkage model considers all three sets of factors important.

The NSF implementation strategies focusing on specific curricula are an example in education of the RDDA model; so are the experiments with planned curriculum variations in early childhood and in compensatory education. Many of the dissemination strategies used by the regional laboratories for specific products, for example, in implementing IGE or EBCE, *also focus on the R&D product. The RDDA model, most appropriate to the technology push context, presumes a rational and linear sequence of activities carried out by agencies with well differentiated roles and culminating in acceptance of R&D by a compliant consumer. Clearly these are not conditions that dominate knowledge production and utilization in education

The problem solving model, appropriate to the needs pull context, focuses almost exclusively on the operational site, which, in education, is the LEA or individual school. The problem solving process defines success from the point of view of the participants and their preception of the change in teacher and administrator behavior. Thus the characteristics of the LEA become the most important factors in considering implementation success, for example, the organizational climate, the motivation of participants, and the local change strategy. Inputs from outside the LEA such as characteristics of an innovation to be implemented and linkage to R&D expertise play a relatively minor part. NIE is studying this change strategy through the Local Problem Solving Program. Because of its emphasis on each individual operational site, the model offers little possibility for mass diffusion and utilization.

The social interaction model is concerned with all the communities involved in producing and utilizing R&D. It takes account of the highly decentralized nature of education and educational R&D, where agencies

* Individually Guided Education
* Experience Based Career Education

have overlapping functions and complex relationships. The model stresses person-to-person communication through the opinion leadership of the education communities, the characteristics of the adopter of an innovation, and the education system characteristics, particularly the power and influence structures. In the pure form, it assumes the existence of a diffusible innovation and pays little attention to implementation. It has substantial empirical support, largely from the fields of rural sociology and anthropology, based on the study of the flow of innovations through a social system. Studies in education include investigation of the adoption of new mathematics curricula and the spread of innovative ideas among a network of school superintendents.

The linkage perspective envisions the user as a problem-solver, but with meaningful connection to outside resources. The resource system, in turn, is closely tied to the users. The user and the resource systems are engaged in a reciprocal and collaborative relationship. Because of the linkage perspective's synthesis of all the important factors that appear to affect knowledge use in education, it has great promise for generating effective programs. Therefore, NIE's dissemination efforts are devoting substantial resources to understanding and improving linkage mechanisms between R&D and user communities in education.

## The Role of the Federal Government

As illustrated by the examples cited in the previous section, the Federal government has pursued strategies focusing on one or another of the major elements involved in producing and utilizing R&D; the resource system (RDDA model), the user system (problem solving model), and communication between them (the social interaction model). In each area, the Federal government has very specific roles to pay; the linkage model demands that all three areas must be addressed appropriately if effective dissemination and utilization of knowledge is to come about. Moreover, we feel that the Federal government must be a participant in, rather than the director of, knowledge production and utilization in the education community. Thus, the Federal role referred to in this section is one of providing stimulation in the form of financial

support, coordinating efforts by the field, providing technical assistance to grantees and contractors, and collaborating with the field in developing programs that best meet their needs.

With respect to the knowledge resource base associated with R&D activities, the earlier discussion implies a need to develop general and specific resources. Generalized and comprehensive information systems must be organized, made accessible, and coordinated. The acquisition of knowledge, its screening and processing into systems relevant and accessible to all educators, are tasks that cannot be resolved effectively by a series of independent, uncoordinated efforts. Further, the problem of accessing and transforming new types of knowledge requires considerable investment for design, development and field testing. Such endeavors are not sufficiently profitable in a reasonable time frame to be undertaken in the private sector and are beyond the resources of any governmental sector other than the Federal one. Providing focused information and transforming it for specific audiences can be carried out by a variety of sources. However, understanding how potentially useful knowledge and information can be organized and transformed to serve various needs is poorly developed; therefore, it is a responsibility of the Federal government to support relevant research and experimentation in the area of knowledge synthesis and transformation.

As to building greater capacity within the educational system for identifying problems and helping solve them through the use of R&D, the Federal government is in the best position of applying the lessons of past attempts in the area. For example, Title V. ESEA, provided funds to State education agencies (SEAs) for their operations. In addition to grants to individual States, Sec. 505, provided support for interstate projects intended to deal with issues of mutual concern. Under Title V support, relatively little was done to build dissemination capacity in SEAs. This appears to be attributable to two different factors:

> the relatively greater level of concern that the States felt to solve other problems (e.g., recruitment of new staff, development of management information systems, etc.) and

the rather non-directive posture of Title V staff in the Office of Education with regard to advocating one type of SEA improvement over another.

A major lesson learned from Title V was that if one hopes to impact on SEAs with regard to specific problems (e.g., R&D dissemination and utilization), it is necessary to provide categorical support in those areas. As a result, later efforts to build SEA capacity focused on knowledge utilization and stressed State commitment of resources to the activity from the very beginning. Experiments involving thress State education agencies (and later six others) indicated that, by investing Federal seed money to provide access to existing knowledge resources and interpersonal links to those resources (in the form of "extension agents"), capacity for knowledge utilization can be built that is maintained at some level after phase-out of Federal funds. Another important element is to establish a collaborative relationship between the Federal government and the SEAs that encourages diverse approaches to SEA dissemination programs based upon the unique conditions in each individual State. The need for flexibility and diversity becomes even greater as such efforts are extended to other groups having responsibility for delivering and improving education. In the long run, State dissemination programs should be a State responsibility. In the present formative stage, the Federal government can assist in establishing the capability by providing seed money, documenting and evaluating experience with different models, and provding technical assistance.

In the area of building more adequate links between the disparate elements of the R&D system and the operating education system, the Federal government is in a central position to provide leadership and coordination. The size of the education enterprise implies that dissemination must be carried on by many agencies, but in a coordinated fashion. Its complexity argues for the need to involve a wide variety of actors in program development. While the problems cannot be solved by Federal efforts alone and the resources of State and local education agencies, professional groups, and others must also be committed to the effort, a major role for the Federal government is justified. The problems are general ones affecting all States, and the supplemental resources required are greater than individual States can marshall. The private sector is in an ambiguous position, lacking market incentives and in some cases the expertise to incorporate R&D outcomes rapidly and effectively into what it produces and distributes. Federal participation and support in this area in no way threaten the autonomy of local or State education agencies if programs are oriented toward the solution of problems, not the advocacy of specific innovations or products. Thus, choices among R&D outcomes or between R&D outcomes and other solutions will remain at the local level. A limited attempt to build linkages between LEAs to share information about exemplary practice was carried out through Title III, ESEA. In this program money was provided directly to innovative LEAs to help them spread their programs to other sites. Experience with this program uncovered the following difficulties:

- the attempt to disseminate information about exemplary practice faltered because it lacked focus and was not based on verified sources of information;
- there was little transportability from site to site;
- separate Title III networks were created, often overlapping or in conflict with existing State services.

Experience with this program bears out the assumptions of the linkage model. Dissemination programs, to be successful, must build links that carry developed research and product information in major problem areas to the education community and that systematically use existing resources rather than create competing networks.

In general the role of the Federal government changes from direct support of research and of services that should be provided on a national basis to facilitation support for services that should be provided on a local basis. Figure 2 is a representation of the Federal role in dissemination and utilization of educational R&D, with some sample NIE programs located for illustration.

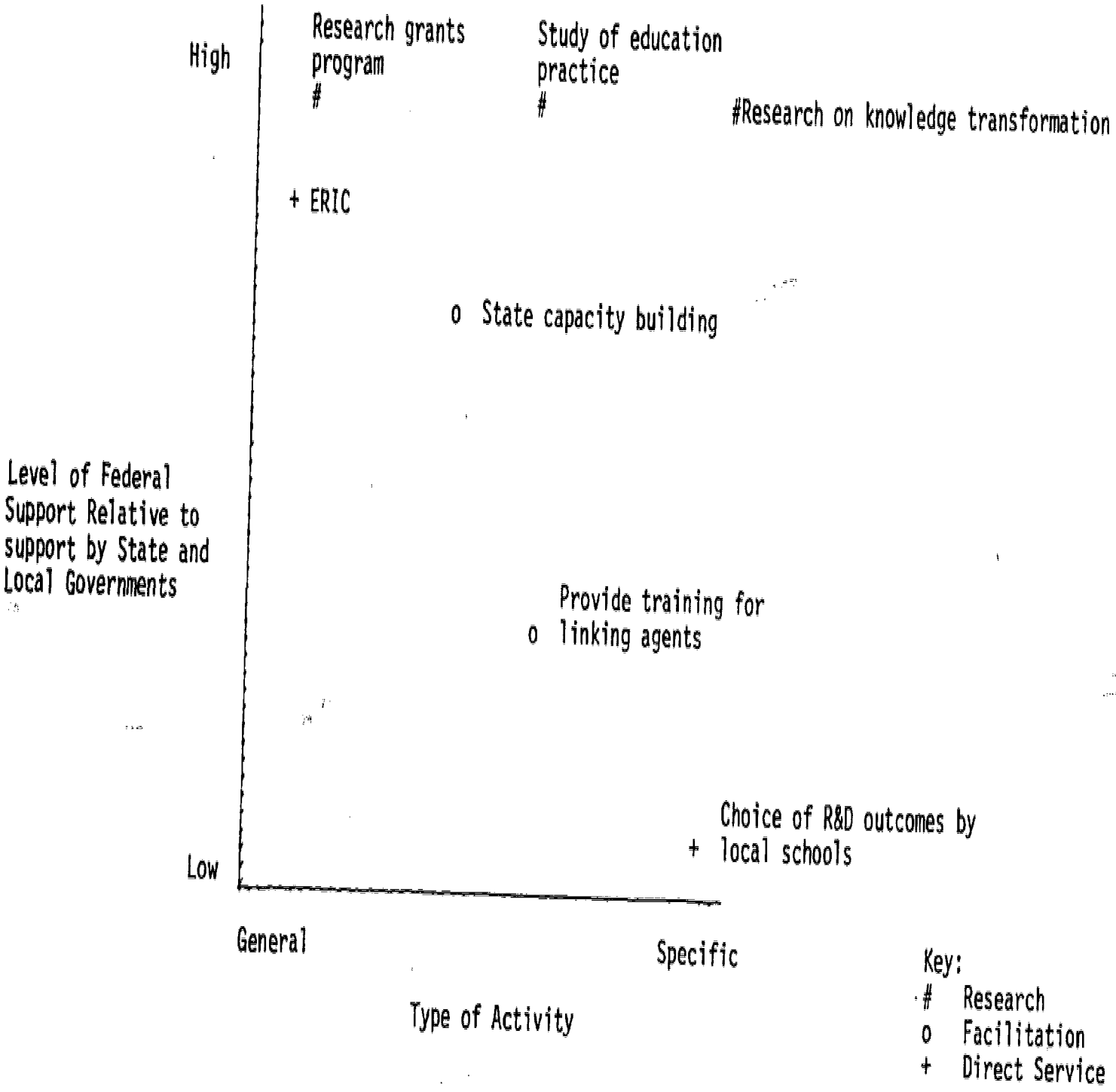
## Program Overview

The Dissemination and Resources Group (DRG) has the principal responsibility for addressing the Institute's mission in dissemination. The Program goal of DRG is to ensure that the education community derives optimal benefit from the body of knowledge about education. That body of knowledge encompasses the outcomes of R&D supported by NIE as well as elsewhere, including effective practice emerging from the schools. DRG programs aim at serving those with a "Need to know" -- teachers and students, administrators, school board members, researchers, parents, legislators.

The program is designed to address the needs generated by the nature of the education enterprise--its size, complexity, and decentralization--and by the nature of the supporting knowledge base--its fragmentation, limited accessibility, low relevance to classroom problems, impersonality, scientific and technological weaknesses, and the inadequate participation by minority groups in its development and use. Program activities are built around the four elements that must advance together if the education community is to benefit fully from the current and growing body of knowledge: research on the knowledge-producing and using systems; improvement of the knowledge resource base and access to it; improved capacity for using and advancing knowledge; and strengthened links between R&D and practice. The program activities employed in these four areas are based on the following set of assumptions about NIE's appropriate role:

> Limitations. NIE is only one of many actors in education in the Nation. Indeed, the Federal government as a whole is a minority partner in education, providing only 8% of the educational dollar at the elementary and secondary level.

Figure 2: Appropriate Level of Federal Support for Dissemination and Utilization as a Function of the Type of Activity*




* Detailed descriptions of the programs are included in the section "FY 1978 Program Strategies."

- Assets of existing organizations. There are strengths in many parts of the education enterprise which are assets to DRG's programs. Services, policies, competencies that are already a part of education activities (e.g., in State education agencies, in R&D centers) can be built upon to attain the program goals, with the support and cooperation of the field.

- Exercising leverage. Given the preceding two points, DRG should stress those activities that require Federal support and facilitation-activities that help educators benefit from the body of current knowledge but that, for financial reasons or lack of system-wide perspective, are unlikely to emerge spontaneously. Rather than investing in new structures, DRG should emphasize efforts to exercise leverage by marshalling the assets of existing organizations to serve the mutual goal of improving American education.

- Consumer orientation. The limited role of the Federal government in education requires that, to be effective, Federal initiatives must be developed and carried out in partnership with the education communities. Therefore, DRG programs should take a client oriented, consumer information posture, where the consumer is aided to make fully informed but free choices among alternatives.

The FY 1978 program emphasizes consolidating the benefits of activities from previous years, extending activities to increase the number and types of participants in knowledge producing and using functions (i.e., research, development, evaluation, demonstration, dissemination and application of knowledge to solve problems). New activities are planned where logical next steps are required toward the overall program goal. Figure 3 exhibits major program elements and associated activities.

## FY 1978 Program Strategies

DRG programs are intended to help the education professional and concerned layman with whatever problems are amenable to the application of research knowledge and information about effective practice. However, in order to give perspective to each strategy presented below, we use the problem of "teaching Johnny to read" to illustrate the needs being served.

### Program Strategy: Research on the Knowledge Producing and Using Systems

To help Johnny's teacher find a solution to his particular reading problem, policy makers, researchers and administrators need to know:

- Is the R&D system addressing the pertinent questions? If not, why not?

- Does Johnny have a problem which existing reading theories or teaching methods can't seem to solve? Are there gaps in the knowledge base, in the R&D personnel base, in the institutional base for performing R&D?

FIGURE 3

DISSEMINATION AND RESOURCES GROUP PROGRAMS

FY 1978

| Strategies for Dissemination and Utilization | General Programs | Targeted Programs |
|---|---|---|
| Understanding the R&D System | Monitoring the Educational R&D System<br>Sensing Information Needs in Education<br>Methodology for R&D Functions<br>Research Grants Program | Impact of R&D and Needs for R&D<br>Study of Educational Practice<br>Research and Evaluations on DRG Programs |
| Assuring Access to Knowledge Resources | ERIC<br>New Data Bases<br>Bilingual Clearinghouse | Information on R&D Outcomes |
| Building Capacity | State Dissemination Capacity Building<br>Capacity Building in Professional Associations, Higher Education, Large School Systems<br>Dissemination Leadership<br>Training in R&D Functions for Minorities | |
| Strengthening Linkages | | R&D Utilization: Continuation<br>R&D Utilization: Emphasis on Big-City Schools<br>R&D Dissemination and Feed Forward System<br>Linking Agent Training |

- Are the people doing research on reading problems qualified? Do they have the skills and help they need--the money, advice, and time--to do a good job? If not, what needs to be done to improve their qualifications and provide them with the needed skills and help?

- How can the participation of minorities in R&D be increased so as to insure that the needs of minority group children are addressed effectively?

- What kind of help do teachers trying to solve reading problems ask for (e.g., more information on diagnosing problems, remedial programs for a particular difficulty)? How can good solutions to Johnny's problem be put into the hands of his teacher so that they can be implemented?

Goals. Achievement of the following five-year goals will provide DRG with the ability to identify weak areas of the knowledge producing and using systems and methods for strengthening the components necessary for their effective functioning. Specifically, we plan to:

- Complete the first fully descriptive data base on the institutions, human resources, and activities concerned with R&D in education;

- Achieve full operating capacity for collecting and reporting data on the needs of educators for improved information products and services, and for modification or new initiatives in R&D;

- Complete evaluations of three DRG programs (State Capacity Building Program, R&D Utilization Program, ERIC) to provide data needed to improve the dissemination and utilization strategies;

- Develop better understanding of how R&D affects what goes on in the classroom.

Program Activities. The ability to carry out effectively such functions as research, development, evaluation, demonstration, dissemination and the application of knowledge to improve practice is highly dependent on how well these functions are understood. The activities making up this program element will investigate the present functioning of these components of the education and R&D enterprise and how they may be improved through such specific interventions as changes in support patterns, training, assessment of information needs, and use of program evaluation. The outcomes of this program element will provide methods and practical guidance useful to NIE, to other Federal agencies, and to organizations in the field. Most directly, the outcomes will strengthen other DRG program elements by identifying needed knowledge resources and by providing techniques and data useful for capacity building and linking activities.

MONITORING THE KNOWLEDGE PRODUCTION AND UTILIZATION SYSTEM. FY 1978 activities will expand the work of the preceding four years. The increasing body of findings from this effort provides the basis for examining the structure and communication flows within the knowledge producing and using systems.

Specifically, selected types of organizations (e.g., local education agencies) will be invited to participate collaboratively in an examination of the knowledge producing and using functions they perform relative to other parts of the education system. Special studies employing data collected and refined earlier will address such policy-relevant issues as who is performing the various R&D functions and what skills they need to improve their work.

SENSING INFORMATION NEEDS IN EDUCATION. The Sensing Project, begun in FY 1976, is designed to feed into improvement of knowledge resources by providing policy makers and information service managers with guidance on specific information needs expressed in the field. Sensing data are being collected to identify topics and relevant content coverage on which information is needed; the information-seeking and -using behavior or preferences of educators indicating types of products and services appropriate; and utility of existing products and services. These data will be used by NIE and the field to modify and improve existing knowledge products and services and to highlight what new products and services are required (e.g., state-of-the-art papers, journals, reference services, information networks). The Feedforward System, discussed in full under Strategy 4 (Strengthening Linkages), will provide policy makers and researchers with a continuing source of data to guide R&D programs. The system will collect data from users of specific R&D products (e.g., curriculum materials or instructional techniques) regarding problems encountered in using the products, and from teachers and administrators in general on gaps in existing R&D-based solutions to their problems. The Sensing Network and Feedforward System together identify needed improvements in the knowledge producing and knowledge application functions.

R&D ON KNOWLEDGE SYNTHESIS. Experience, field comment, and use studies agree on the utility of information products offering a target audience (e.g., teachers) a review of relevant knowledge as it applies to a selected classroom problem. DRG continues to support the development and dissemination of such products (the reports on cognitive and social development of young children are examples) but will strengthen these activities through orderly study of such questions as: What types of formats are most useful to teachers, to administrators, to decision makers? What types of factual information should be included for different audiences? When synthesizing knowledge on a specific problem, for example, a problem concerning instructional process, what should be addressed: theories, methods for short-term solutions, large-scale instructional strategies, diagnostic guides? Outcomes of this research are expected to strengthen DRG's development of knowledge products and influence NIE's work in synthesizing research knowledge.

RESEARCH PROGRAMS. Three new activities will be initiated in FY 1978 to build the quality of understanding about knowledge producing and using functions in education. Activities will focus on general knowledge about the structures and functions related to knowledge production and utilization and on experimentation with ways to strengthen the knowledge production and utilization system. To develop general knowledge, proposers will be invited through a research grants program to address questions of a broad nature (e.g., what are the influences on quality of educational R&D exercised by organizational settings, policy constraints, or composition of the work team?) In the area of experimentation support will be provided for field-initiated ideas for innovative action programs aimed at improving the knowledge production

and utilization system. Examples of activities that might be supported are experimentation with new organizational forms, new ways to provide and utilize human resources, and new ways to provide knowledge production and utilization system integration and coordination. A third activity will provide DRG with the resources to capitalize on unique, promising ideas from the field through the support of unsolicted proposals on any problem area contributing to the overall goals of the DRG program.

SCHOOL PRACTICE STUDY. An FY 1978 Institute-wide initiative, this study will illuminate what is actually happening in classrooms and school buildings across the nation. The DRG interest in the study is specifically in the process of using R&D knowledge, implementing improved practice and in the impact of R&D on present instruction. That kind of data will suggest needed modifications in the way research knowledge is provided, R&D products are designed and disseminated, and technical assistance is made available.

PROGRAM EVALUATION. The 1978 plan includes substantial evaluation components associated with three major program activities described below: the State Capacity Building Program (Capacity Building strategy); the R&D Utilization Program (Linkage strategy); and the Education Resources Information Center (ERIC) (Knowledge Access strategy). These evaluation components serve two related purposes: the short-term purpose--to help managers and policy-makers improve and strengthen their programs and delete non-productive aspects; and the long-term purpose--to provide information on how specific program arrangements operate to serve the field. For example, the evaluation of the R&D Utilization Program will be useful to NIE and other agencies in planning effective types of linkage arrangements. The State Capacity Building Program evaluation will provide the States with guidance on methods of improving their own dissemination capacity (e.g., using techniques successfully employed in other States as identified by the evaluation contractor). This evaluation will also instruct NIE on aspects of State capacity building efforts that require specialized technical assistance for successful achievement of the program goals. The ERIC evaluation will provide data on how effectively and efficiently the system performs to acquire, process and make education knowledge available to users.

Program Strategy: Assuring Access to Knowledge Resources

To learn more about why Johnny can't read and to find a solution to his difficulty, his teacher and his principal may need any or all of the following:

- A comprehensive collection of reports, journal articles and papers, written by people from all levels of the education enterprise, through which a teacher could search for relevant material on the theories and solutions applicable to reading problems.

- A way of using that body of knowledge which suits the busy life of a teacher or principal, for example, a critical summary prepared on the theories and potential solutions to reading problems,

- Comsumer information on available reading programs, including comments from teachers who have used those programs.

A superintendent might need to know the costs of installing a new program and requisite teacher training; school board members might be concerned with how well it helps students learn to read; parents might wish to examine its content for social fairness.

Goals: Achievement of the following five-year goals will result in extending the knowledge resources accessible to educators and in increasing products and services that assist educators to apply R&D knowledge. Specifically, we will:

- Continue the operation of ERIC, with expanded availability and increased use of its resources by educators through services offered by user organizations;
- Improve ERIC operations through refinement of acquisition, processing, search, retrieval, and document distribution procedures;
- Develop and maintain up to four new data bases in addition to or in conjunction with ERIC in areas such as education-related law and operating school practice;
- Provide catalogs of R&D products regularly updated, including consumer-oriented information on R&D outcomes for classroom application;
- Achieve full operation of the Bilingual Clearinghouse serving the information needs of educators teaching non-English speaking students.

Program Activities: Programs in this area provide the education community with a wide range of knowledge resources about education and make this expanded knowledge base more accessible and easier to use. Knowledge resources include the general type aimed at providing assistance in confronting a range of issues in education (e.g., ERIC) as well as the targeted type (e.g., interpretive studies and catalogs of R&D products). In addition to maintaining and improving existing efforts to build organized information systems, support will be provided for consolidating available knowledge around specific problem areas and transforming it to meet the needs of various audiences as identified by the research and sensing activities carried out under strategy 1.

EDUCATION RESOURCES INFORMATION CENTER (ERIC). The ERIC system will be continued, offering the largest screened knowledge base about education in the world including some 230,000 citations of technical and journal literature. It is also one of the most widely used knowledge resources, with over 12,000,000 usages per year. Continuation activities will provide for the functions of the clearinghouses, the processing facility and document reproduction services, and the publication of indexes. Improvements in the operating system, such as refinement of acquisitions, processing, search and retrieval and document distribution procedures will be undertaken as part of the ongoing objective to increase continually the use and availability of ERIC products and services.

An evaluation of the ERIC system will also be undertaken. The system has been in operation for over a decade but has never been subjected to a full-scale, comprehensive evaluation. It is anticipated that, in addition to providing evidence on the effectiveness and efficiency of ERIC, the study will also result in development of instruments and methods which can be used to continue monitoring and evaluating the system on a regular basis. The outcomes of the study will be of use by FY 1980 in determining the need for and feasibility of reconfiguring the ERIC system, with consequent budgetary implications.

DEVELOPMENT OF NEW DATA BASES. In addition to or in conjunction with ERIC, new data bases will be developed and maintained in information areas where existing products and services presently do not meet the needs of the field. Information areas may include resources for classroom application, or education law and policy. Growing out of a multi-year planning and development effort, up to two new data bases will be designed, developed, and field tested. Selection and design of these data bases are guided by results of the Study of Information Requirements in Education (FY 1974) and the File Selection Study (FY 1976 ) as well as a continuing program of interaction with organizations active in providing information products and services and with representatives of target audiences.

BILINGUAL CLEARINGHOUSE. Public Law 93-380 authorizes the Director of NIE and the Commissioner of Education to collaborate in the establishment and operation of a Clearinghouse on Bilingual Education. On the basis of an agreement reached during FY 1976, the clearinghouse is to be jointly funded by the two agencies, with NIE serving as the lead agency in its implementation. Among the features of this clearinghouse are a data base which goes well beyond the fugitive literature comprising most of the ERIC file, capacity for two-way translation in several languages, expanded efforts to transform technical literature into user-oriented information products, and more active and extensive referral and user services. FY 1978 will be the first year of full-scale operation for the clearinghouse.

INFORMATION ON R&D OUTCOMES. Support will be continued for two types of information products. The first type presents analyses of knowledge on a given problem, including facts and methods to help the reader approach the problem and solve it. Generally presented in the form of short papers on critical, current topics, these analyses--or knowledge syntheses--will be modified to better serve the educator by using new formats or possibly different media, as warranted by the results of the supporting R&D (see strategy on Understanding the R&D System) conducted in preceding years. These products will be prepared and disseminated through the R&D Dissemination and Feedforward System, which is described in the strategy on linking. The second type includes consumer-oriented information on R&D products. A catalog of NIE-sponsored products published in 1976 will be updated and evaluated, with a new edition being published in FY 1978. The catalog provides educators and policy makers with reliable information on potentially applicable research findings, products and successful practices, including information derived from actual usage. After FY 1978, the catalog will be machine-produced through ERIC and/or the practice file to be established by the time of future catalog editions. Specialized catalogs may also be produced from time to time as the need warrants.

Program Strategy: Building Capacity in the Education System

A teacher does not have a large travel budget or free time to find out about all the ideas and technical assistance which could be used to improve Johnny's reading skills. Organizations with which the teacher or the school system may be connected (e.g., State education agencies, intermediate service units, institutions of higher education, professional associations) can help Johnny's teacher look for useful ideas and technical assistance provided those organizations have the capacity to perform the following services: find out about, and keep current information that could respond to the problem Johnny's teacher is facing; tell Johnny's teacher what assistance is available; and actually provide the needed information. This implies adequate connections to the knowledge resource base and ability to furnish person-to-person service of the kind provided by the agriculture extension agent.

Goals. Accomplishment of the following five-year goals will expand both the number and types of organizations capable of providing comprehensive dissemination services:

- Complete building full dissemination capacity in up to two-thirds of the State education agencies and significant capacity in the remainder of the States;
- Develop dissemination capacity in at least four alternative settings including professional associations, big city schools systems, institutions of higher education and institutions reaching minority groups and students who are poorly served by the education system;
- Continue to maintain a national forum, through support of regular meetings and publications to help dissemination policy makers and managers exchange ideas and techniques for improving dissemination practices in State education agencies and alternative settings;
- Increase participation by minority groups in knowledge production and utilization in education through training and technical assistance and through up to six appropriate capacity building projects in alternative settings;
- Initiate a program of improving community college programs through more extensive application of information on R&D knowledge and improved instructional strategies;
- Enhance knowledge-using behavior in all education sectors by assisting teacher (and administrator) training institutions to incorporate appropriate materials in their pre-service and inservice curricula.

Program Activities: The capacity of an organization to serve the information needs of the field--that is, provide the best available knowledge applicable to an educator's problem--depends on that organization's ability to marshall a comprehensive body of information about education knowledge, to put relevant knowledge into the hands of people who can apply it, and to provide the leadership necessary to maintain a high-quality dissemination program. While local, regional and even national level institutions are presently engaged in dissemination activities, their efforts hardly begin to surmount the difficulties raised by the complex nature of the education and education R&D systems.

One important key to increasing dissemination capacity within education is the State education agency, both because it is the level of government constitutionally responsible for education, and because State agencies have more and more moved into a service role with respect to their client school systems. The current State dissemination program, to be continued in FY 1978, is based on these considerations and upon the experience with the earlier pilot program. FY 1976 saw the initiation of efforts to build dissemination capacity in settings other than State agencies when a program focusing on education associations began. In FY 1977 and FY 1978 these efforts will expand to include postsecondary institutions with emphasis on community colleges, teacher education institutions, and large school system.

Capacity building efforts are concerned with developing effective intermediaries that can link the local educator to national information sources, and providing information resources in locations physically close to potential users. The intent is to improve knowledge utilization at many levels of education by decentralizing dissemination activities and using extant capacity of the many organizations and networks currently serving the education system, such as State education agencies, information service centers, and professional organizations.

BUILDING DISSEMINATION CAPACITY IN STATE EDUCATION AGENCIES. A grant program, initiated in FY 1975, provides support for three to five years for each State choosing to participate in the program to build comprehensive and continuing dissemination capacity. State education agencies are the first target of a major capacity building program for three reasons: Education is a constitutionally defined function of States; the State agency is almost unique in American education in its capacity to exercise leverage--it can reallocate funds, it can influence legislation, it can regulate; by working with State education agencies, it is possible to have nation-wide impact while dealing with a relatively small number of grantees at a relatively limited budget level.

States may compete for one of two types of grants. Capacity Building grants provide support for building a comprehensive knowledge resource base, linkage to serve clients, and leadership within the agency to provide for maintenance and enhancement of dissemination services in the future. Special Purpose grants support short-term efforts to improve the State's dissemination posture.

In FY 1978, it is anticipated that 10 States will successfully compete for capacity building grants and five for special purpose grants. These awards will raise the number of States building capacity under the long-term grants to approximately 40. The evaluation and training attached to this program are designed to strengthen the State capacity building effort.

BUILDING DISSEMINATION CAPACITY IN ALTERNATIVE SETTINGS FY 1976 saw the initiation of DRG efforts to build dissemination capacity in settings other than State education agencies. The program initiated in that year focused on education associations. The design of this program emerged from conferences with selected association representatives, leading to a concepts paper to which over 350 associations at the national, regional, State, and local levels were invited to respond. Although capacity building of the sort underway in SEAs has not proved feasible for associations, it has been possible to support selected associations to conduct planning efforts for improved or expanded dissemination programs and to engage in pilot expansions or improvements of their dissemination activities.

The FY 1976 competition will result in awards to 7-10 associations for planning or pilot activities, continued into FY 1977. Subject to the availability fo funds, additional awards will be made in FY 1977 to other associations and a limited number of postsecondary institutions. The proposed level of funding for FY 1978 will permit continuation of support for dissemination activities in education associations, expansion of efforts to build dissemination capacity in postsecondary institutions, and initiation of analogous efforts in large school systems, intermediate education service agencies, and for specialized services for minorities and other groups not having access to knowledge resources about education

The activities involving postsecondary institutions will have two objectives. The first is to build capacity within community colleges to improve their educational programs through use of research knowledge and information about innovative practice. Of particular interest will be efforts of institutions and groups of institutions attempting to serve non-traditional clienteles. The program initiative will be based on careful examination of current dissemination activities conducted by the ERIC clearinghouse on community colleges, by the relevant professional organizations, and by such networks as NEXUS. The second initiative will address the capability of teacher training institutions to teach their students, both inservice and preservice, effective knowledge-seeking and -using behaviors. The aim is to obtain a greater number of professionals in education systems who are competent to tap the resources available to them for ameliorating educational problems. The effort will be developed in collaboration with deans of education and other institutional staff interested in improving the education they now offer to education professionals.

THE STATE DISSEMINATION LEADERSHIP PROGRAM, begun in 1969 with dissemination representatives from each State, will be continued and expanded in FY 1978 to include individuals providing information products and services sponsored by organizations other than SEAs. The program offers a mechanism for communication regarding improved dissemination techniques and opportunities for mutual efforts to respond to the information needs of educators and address the challenges of providing access to a comprehensive range of knowledge resources.

TRAINING IN R&D FUNCTIONS FOR MINORITIES. A program of training and technical assistance for individuals from minority groups will be continued. Activities will focus on apprenticeships in research and development facilities, and on field experience in settings that provide opportunities for identifying and applying research knowledge and information on effective practice to educational problems of inner-city, poor, and minority children. The principal thrust would be to extend opportunities in ongoing programs of research, development and diffusion to participants from minority groups. A second approach will deal with the lack of adequate participation in Federal grants and contracts programs through technical assistance to minority R&D personnel. Possible elements are collaborative publications, general and targeted conference participation, limited competitions for grants or contracts to support specific projects, and reduced teaching or other service loads to permit time for R&D work.

Program Strategy: Strengthening Linkages Between R&D and Practice

The organizations or individuals to whom Johnny's teacher turns for assistance can locate the pertinent information; but they can also do more. They can improve skills in listening to the problem as Johnny's teacher describes it, helping in an accurate definition, and searching for the most appropriate solutions available. When the problems faced by Johnny's teacher are not adequately addressed by the theories, curriculum units or practices presently available, the linkers can inform researchers and developers (e.g., in R&D centers, institutions of higher education, research units in SEAs) so that new and better solutions can be developed. When potentially useful solutions are identified, the individual working directly with the teacher or school can identify R&D agencies with adequate expertise to help in necessary adaptation and evaluation. Finally, the linker can keep track of the implementation process and, if the problem is not sufficiently ameliorated, repeat the cycle.

Goals. Accomplishment of the following five-year goals will result in the demonstration and evaluation of linkage arrangements focusing on R&D utilization in several major problem areas (e.g. basic skills, career education), and a fully operational linking network for delivering information about a wide range of R&D products:

- Complete seven projects begun in FY 1976 to develop model linking arrangements where local, regional, and State education agencies, R&D organizations, and institutions of higher education work together to provide information and implementation assistance for R&D outcomes serving local needs;
- Initiate five to seven additional projects to develop alternative linking models where large city school systems and other institutions serving a high proportion of minority children are the chief knowledge users;
- Expand the number of participants in the R&D Dissemination and Feedforward Network from 8 projects planned for FY 1977 to the total number needed to provide information about R&D products to all regions of the country;

- Provide full access to materials for training linking agents in the process skills related to knowledge dissemination and utilization with a view to integrating this project into the R&D Dissemination and Feed-forward Network.

Program Activities. The objective of improving linkages among the many components of the education and the research communities is at the heart of most of the activities in DRG. For example, in the previous section linkage is described as one aspect of building dissemination capacity in an education organization. This strategy, however, is concerned specifically with linking research and practice in order to help education practitioners to identify, examine, and effectively implement R&D-based solutions to high priority educational problems. Local, intermediate, and State education agencies, R&D organizations, and institutions of higher education work together to provide technical assistance to local schools. R&D organizations cooperate in providing client-oriented information describing available R&D products to schools, helping with needed adaptation, and assessing the impact of R&D on users. Complementing these activities aimed at improving linkage is a project that will coordinate and synthesize training materials for linking agents and conduct pilot training programs. The purpose of building linkages between the R&D and practice communtities is to bring each closer to the other with the result that each can build a better understanding of the other's strengths. For example, intermediate service units (ISAs) are well aware of the needs of school people with whom they deal daily; R&D organizations have the skills and staff to design programs that ISAs can use to serve those needs. The purpose of the program activities is: to create organizational interpersonal linkages between the many disparate elements of the R&D system and the operating education system; to bring the specialized resources of R&D institutions to bear in helping practitioners implement R&D based-solutions to locally defined problems; to improve the flow of information about R&D products and the availability of technical assistance to local schools; and to inform the R&D communities of modifications of new efforts needed to speak to the problems of the classroom.

R&D UTILIZATION PROGRAM. A new competition will be held in FY 1978, following on the experience gained through the seven thirty-month projects initiated in FY 1976. The first wave of projects provide data and insights about several methods of linking R&D producers with organizations serving practitioners to improve the flow of information about and technical assistance supporting the adaptation of R&D products to local situations. This first wave will be continued for an additional 24 months in FY 1978, given acceptable levels of performance. In FY 1978 5-7 contracts will be awarded through the new competition and will be continued in FY 1979, for a total duration of thirty months. The second set of projects will draw on the outcomes of the first, as explored and documented through a formal assessment program. The new projects will focus on improving links to R&D for selected types of user organizations. Specific efforts to serve the needs of groups who have traditionally been cut off from access to information for improving education practice will be an explicit target of the FY 1978 program. For example, it is anticipated that several large city school systems will be involved in the FY 1978 funding. The second wave will be the last in this experimental program. At this conclusion, results will be made widely available to decision-makers at the Federal and State level so that they can consider the value of mounting a large initiative based on the concepts and experiences of the program.

R&D DISSEMINATION AND FEEDFORWARD PROGRAM. The work supported may be called an omnibus activity, contributing directly to three of the four DRG strategies. The overall program consists of selected R&D producers (e.g., education research centers and regional laboratories) linked together to provide information on R&D outcomes to the field through regionally offered services. Within the network of organizations, consumer oriented information on R&D products will be catalogued and knowledge synthesis products will be developed and disseminated, in concert with the strategy to assure access to knowledge. Finally, a feedforward system will be employed to collect data through the regional service sites regarding client reactions to an R&D product, and client needs not served by available R&D products. A competition will be held in FY 1978 to expand the number of participating organizations in this program. Building on developmental activities in FY 1976, the program was fully initiated with the first set of operational awards to participating organizations in FY 1977. Program activities encourage R&D-producing organizations throughout the Nation to conduct mutually desired dissemination activities, coordinated through a limited number serving all parts of the country. The program is intended to reduce the large duplication in effort as individual developers reach out, in many cases, to most of the Nation's 17,000 school districts and 2,000,000 teachers, the traditional pattern in disseminating R&D products. In addition, the program is designed to increase the availability of comparative information on R&D products for use by interested schools, reduce the number of separate product campaigns by R&D producers which contribute to an ever-increasing information overload for school people, and remove the burden on developers to advocate use of their own products over another that may be more appropriate to the client's need

LINKAGE AGENT TRAINING. This project provides NIE-supported and other materials for training individuals in a new role, that of education linkage agent. Skills are needed by individuals in organizations such as SEAs and ISAs that are offering linking services to teachers and other school personnel to find knowledge resources they need. In FY 1978 developmental work will be continued on specific types of training materials in parallel with coordination, synthesis and technical assistance activities to make the materials more accessible to the field. The plan is to integrate this project into the R&D dissemination and feedforward network, once the latter is fully established and developmental activities for the linking agent training program have been completed.

## Consequences of the Total DRG Program

The total DRG program will continue to focus on the three functional areas of Federal responsibility in dissemination and utilization--service most effectively provided at the national level, facilitation of service at the local level, and research--described earlier and illustrated in Figure 2. Due to the nature of these functions, the long-range implications for the activities within each are different. As mentioned previously, we will provide services only in those areas where the resources and coordination of the Federal government are needed, e.g., comprehensive knowledge resources. Within service at the national level, therefore, DRG will maintain a continuing commitment with slight budget increases to allow for inflation and system improvements. Examples are the ERIC system and the R&D dissemination and feedforward network. In the area of facilitation, DRG will attempt to provide the monetary and intellectual resources necessary to

stimulate other sectors of the education community to assume leadership in dissemination and utilization. With respect to any specific activity, e.g., capacity building, the allocation of resources by DRG will decrease as the commitment by other sectors increases. In order to improve our programs and to enhance the effectiveness of all dissemination and utilization activities in education, research will continue to be a necessary component of the total DRG program. The size of the research effort and the areas of emphasis will fluctuate according to budget constraints, field interest and capability, and programmatic needs. Relationships of DRG programs to these three Federal functions and future-year implications are illustrated in Figure 4.

Although improvements in education will result if we accomplish our specific goals in each strategy described in the previous section, more significant and permanent improvements in the dissemination and utilization of knowledge about education will result from the combined effects of the total DRG program. Taken together, our programs focusing on various combinations of the knowledge producer, disseminator, and user groups in education will build a stronger sense of community among these groups. During the planning, implementation, and evaluation of our programs, these constituencies are continually convened to react to our plans and programs, suggest new programmatic directions, and share their experiences. Through these meetings we hope that there may be an increasing level of professionalization among the various individuals engaged in the production, dissemination, and utilization of knowledge about education.

# FIGURE 4: FUTURE-YEAR IMPLICATION OF DRG ACTIVITIES

| Federal Function | DRG Activity | Projected Years of Support 79 80 81 82 83 84 85 |
|---|---|---|
| **SERVICES AT NATIONAL LEVEL:** Continuing Budget Commitment; Stable funding after service is operational, with increases allowing for inflation; Serve needs which can only be met with federal resources and coordination. | Education Resources Information Center(ERIC) Maintenance- Data Bases Implemented in FY78 | ——→ |
| | Bilingual Clearinghouse | ——→ |
| | Sensing Information Needs in Education | ——→ |
| | R&D Dissemination and Feedforward Network (includes Linkage Agent Training Project; Information on R&D Outcomes; Feedforward) | ——→ |
| | Dissemination Leadership Project | ——→ |
| **FACILITATION:** Budget allocated for limited time period; Funding pattern declines as projects phase out and recipient organization assumes responsibility; Stimulates other sectors of the education community to assume leadership in providing dissemination and utilization. | State Capacity Building Program | ——X |
| | Capacity Building in Alternative Settings | |
| | Complete Projects Initiated in FY76 | ——X |
| | Complete Projects Initiated in FY78 | ——X |
| | Training in KPU Functions for Minorities | ——X |
| **RESEARCH:** Budget allocations fluctuate according to annual budget constraints; Funding pattern mixed, according to the work to be performed; Enhances effectiveness of DRG programs and dissemination & utilization activities in the field. | On-Going: | |
| | Monitoring R&D System | ····→ |
| | Research Grants (field initiated;directed;unsolicited) | ····→ |
| | Evaluation: DRG Programs | ····→ |
| | Capacity Building Program Evaluations | ····X |
| | R&D Utilization Program Evaluation | ····X |
| | Limited Duration: | |
| | R&D Utilization Program | |
| | Complete projects begun in FY76 | ——X |
| | Complete Projects begun in FY78 | ——X |
| | Study of Education Practice | ——X |

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