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ABSTRACT

A 1971 pilot project was conducted in North Carolina to promote more effective utilization of research and development activities at both State and local levels. The project provided research information on structure and techniques in new programs to educational program decisionmakers prior to the time for decisions to be made on their own new projects. The project's model research dissemination system included three components: (1) intensive field services to five satellite centers, in areas representative of local educational agencies, that developed awareness, interest, and competency in research utilization; (2) the Research and Information Center which solicited, received, and serviced information requests; and (3) a computerized retrieval system that provided speedy searches of the ERIC RIE and CIJE files. Appendixes present sample products developed during the course of the project. (Pages 61-77 have been omitted in the absence of reproduction rights.) (Author/RA)

FINAL REPORT ON

PROJECT NO. 0-0715

GRANT NO. OEG-0-70-4328

DEVELOPMENT OF A MODEL RESEARCH DISSEMINATION SYSTEM FOR STATE EDUCATIONAL AGENCIES

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The work presented or reported herein was performed pursuant to a Gra from the U.S. Office of Education, Department of Health, Education, and Welfare. However, the opinions expressed herein do not necessarily reflect the position or policy of the U.S. Office of Education, and no official endorsement by the U.S. Office of Education should be inferred.

U.S. DEPARTMENT OF
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BUREAU OF RESEARCH

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PART I INTRODUCTION AND OVERVIEW

This past year a pilot project was conducted in North Carolina to promote more effective utilization of research and development activities at both the State and local levels. It provided research information on structure and techniques in new programs to educational program decision-makers prior to the time for decisions to be made on their own new projects.

The project's model research dissemination system included three components. The first provided intensive field services to five satellite centers located in areas representative of local educational agencies in North Carolina. These services developed awareness, interest, and competency in research utilization. Another component, The Research and Information Center, solicited, received, and serviced information requests. The third component, a computerized retrieval system, provided speedy searches of the ERIC RIE and CIJE files.

Entitled "The Development of a Model Research Dissemination System for State Educational Agencies," the project was supported in part by the U.S. Office of Education through the Division of Information Resources of the National Center for Educational Communication.

General Objectives

The general project objectives were as follows:

1. field testing an inverted file computerized retrieval system for searching the ERIC files, including ED and EJ publications
2. soliciting and servicing research and development information needs of educational practitioners
3. providing field services to serve as an interface between information resources and the needs of educational practitioners
4. developing interstate relationships which will enable other states to become part of a research dissemination network

5. developing liaison and feedback relationships with ERIC Central and the ERIC clearinghouses

Specific Objectives

The general objectives were supplemented by more specific process objectives. They were:

- to field test a computer based retrieval system on the ERIC data files in cooperation with the Center for Occupational Education
- to provide intensive field services to three pilot satellite areas comprised of several adjacent local educational agencies. (The intensive dissemination services would assist groups within the satellite areas to define their information needs and to develop strategies toward meeting these needs.)
- to coordinate with other departments in the State Department of Public Instruction to provide more efficient research utilization by State Department staff
- to provide three research retrieval specialists to conduct searches, review the results of the search, and provide the user requesting the search with appropriate forms of information
- to provide computer retrieval services, on a pilot basis, to nearby states that are interested in developing an interstate retrieval service center
- to conduct a conference for dissemination specialists in surrounding states in order to exchange techniques of information dissemination and to plan for continued development of dissemination systems in SEA's
- to provide the ERIC clearinghouses with feedback gained while working with educational practitioners in LEA's

Description and Scope of the Project

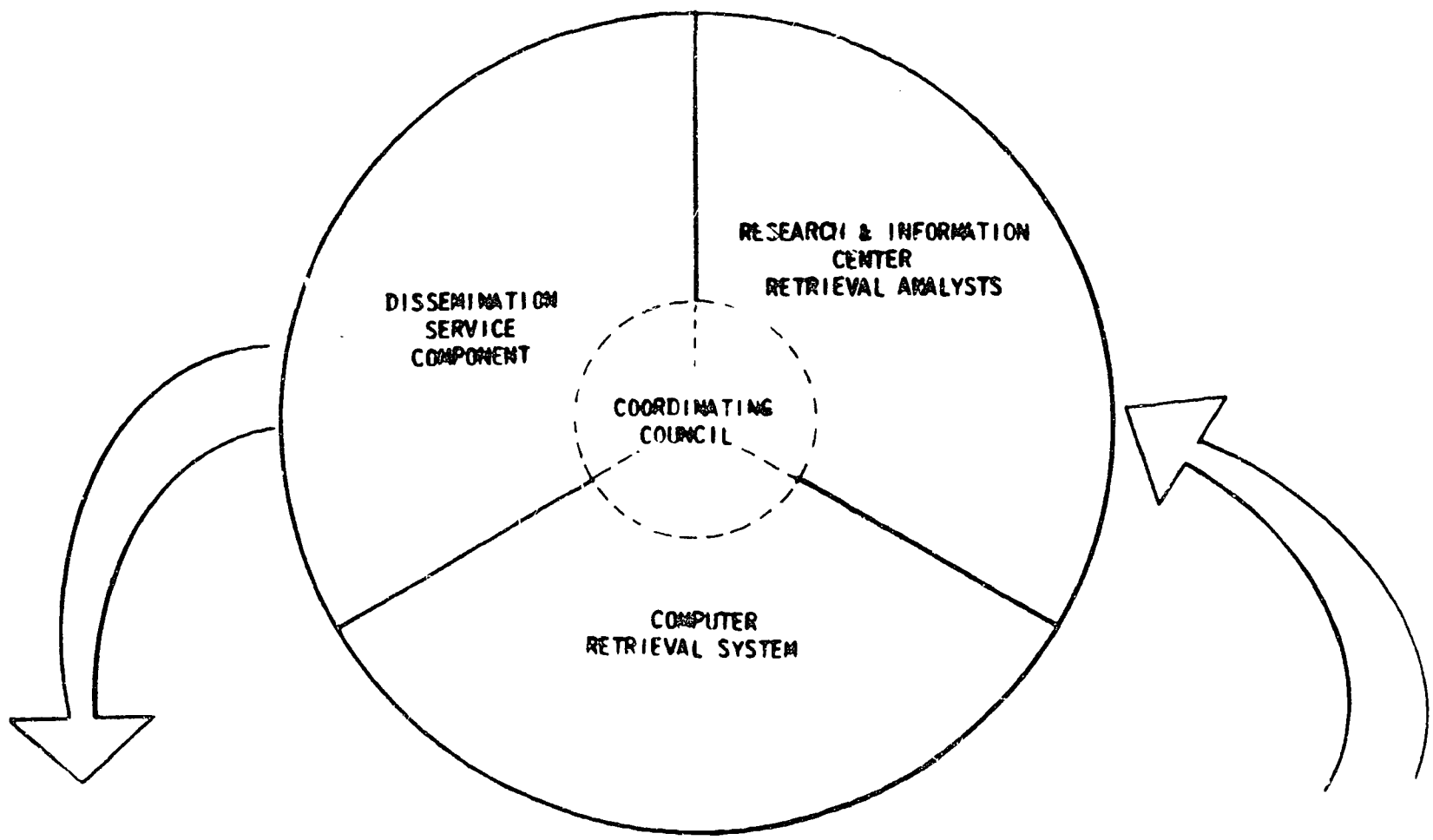
Figure 1 indicates the three distinct components of the Model Information System: The Research and Information Center, the Computerized Retrieval System, and Research Utilization. Each component was independent administratively , but functionally, the components were interrelated in a system through the coordination of their services. For example, after the research utilization services had provided awareness and training, requests for information from the clientele would go directly to the Research and Information Center (RIC). In turn, the staff of the RIC could retrieve information in the requested area by using the computerized retrieval system on the ERIC files.

Five local educational agencies were selected for field testing the dissemination process. An algorithm of innovation proneness was determined and used as the criterion for selection. The local educational agencies selected were representative of various levels of innovation.

The algorithm for innovation proneness assigned a value to each LEA's activity and success in securing Federal and State funds which are distributed on a competitive basis, such as Title III, ESEA. A local educational agency was chosen from each third of a list which ranked the LEA's in innovation proneness. Two LEA's located near the State Capital were added because their proximity would place little additional strain on the field services. Although the two major audiences, decision-makers at the state and local levels, were to receive major emphasis, a sixth and different center was established at a local university toward the end of its spring semester. Since the majority of graduate education classes require their students to prepare term papers, the university center provided the project with fundamental data on the benefit of computerized information retrieval to students.

The utilization of research requires diversity and flexibility in the application of strategies and techniques to meet the information needs of various target audiences. Part II will describe a Model Research Dissemination System -- its background, development, and strategies -- which has proved viable in a State Educational Agency.

MODEL INFORMATION DISSEMINATION SYSTEM



FIELD SERVICES

DEVELOPING AWARENESS
IDENTIFYING USER NEEDS
USER TRAINING
COORDINATION
FEEDBACK

INFORMATION REQUESTS

BRIEF SEARCHES
COMPUTER SEARCHES
COMPREHENSIVE SEARCHES
ANNOTATED BIBLIOGRAPHIES

LINKAGES

STATE DEPT. OF PUBLIC INST.	SATELLITE CENTERS	OTHER LEA'S	OTHER SEA'S
. CONSULTANTS . DIRECTORS . EXECUTIVE STAFF . OTHERS	. TEACHERS . SUPERVISORS . PRINCIPALS . SUPERINTENDENTS	AS TIME AND RESOURCES ARE AVAILABLE, OTHER LEA'S WILL BE SERVED.	. REL'S . LINC . OTHERS

Figure 1
Components of Model Information Dissemination System and Linkages with Various Clientele Groups

PART II DESCRIPTION OF THE MODEL RESEARCH DISSEMINATION SYSTEM

One aim of the model was to establish a direct linkage between people looking for information and those who could provide it. An effort was made to establish linkages between several information files, dissemination specialists, and educational specialists who are responsible for providing advice and information to local policy makers, support personnel, and teachers. The following discussion concerns traditionally provided dissemination services.

Research and Information Dissemination

The Research and Information Center in the State Department of Public Instruction acquires information resources and makes them available to the State Department staff. The Research and Information Center (RIC) was created in 1960 with State funds as a supportive arm of the State Education Agency (SEA) and primarily served the SEA staff. RIC services were provided to other educators as staff resources would permit. The RIC had three staff positions and a part-time clerk at the beginning of the project. Facilities include space for reading, studying, browsing, and reference work. Publications, microform collections, and microform readers were easily accessible to users.

Collections in the RIC encompassed a comprehensive store of research information and resources including:

- Back (microfilm) and current issues of 275 journals -- about half of the journals are included in CIJE
- Selected dissertations on microfilm
- Basic education indexes and abstracts
- Standard references
- Collections of annotated bibliographies
- Complete ERIC dissemination on microfiche and all ERIC products

- Relevant pamphlets and government publications available in vertical files
- Subscriptions to news and research services
- Files on ERIC Clearinghouse activities
- Special files on North Carolina public schools
- Equipment for reproducing materials, copying machine for printed materials, and a reader-printer for documents on microfiche and microfilm

In addition, cooperative arrangements had been made with regional libraries and centers for supplementing the resources of the Research and Information Center.

As an integral part of the State Education Agency, the Research and Information Center provided a wide variety of services:

- Leadership activities enabling SEA personnel and others to become aware of all materials in the extensive collections now available and to use these materials to greatest advantage within the Center itself
- Leadership activities, varied in terms of user needs, in the broad area of education information dissemination
- Leadership activities to keep personnel in the SEA continually aware of specific educational activities, completed and in progress, throughout the State and the nation. These activities placed considerable emphasis on promising innovative practices.
- Execution of policies and processes which result in a centralized ordering and processing system; and a centralized storage, retrieval, and dissemination system for comprehensive materials collections
- Evaluation of all incoming pamphlets, brochures, position papers, government publications, inter-state publications, and the like

Techniques employed in rendering these services include:

- Servicing the requests of State Department of Public Instruction staff for searches and summaries of research studies
- Preparation and distribution of:

  EMPHASIS, a weekly subject listing of current magazine articles and pamphlets too new to be listed in the standard indexes

  ERIC INSTANT RESEARCH, an irregular annotated subject bibliography covering ERIC documents pertaining to topics of current interest in the SEA and elsewhere

  RECENT AQUISITIONS, an irregular publication listing new and/or noteworthy books acquired by the Center

  ANNOTATED SUBJECT BIBLIOGRAPHIES, an irregular publication issued as a result of the ERIC computer searches and comprehensive reviews of literature

  INFORMATION KITS, containing comprehensive information about the State, the SEA, and ERIC program, the Research and Information Center, and other useful information for new staff members
- Computer retrieval of information of specific subjects stored in the ERIC system

(See Part IV for additional details on the operation of the Research and Information Center.)

Computerized Retrieval Services

The development of a model information dissemination system for State Educational Agencies could not have been accomplished without considerable multi-agency cooperation. These agencies, as well as many others, have been used throughout the project in serving a wide variety of information requests from educational practitioners.

The location, development, and operation of the project's computerized information retrieval file required cooperation and collaboration between four different federal and three different state agencies. Through this effort, the project was able to utilize an existent software retrieval system developed for searching the NASA files as the retrieval system for ERIC materials.

The Center for Occupational Education at North Carolina State University financed a minor modification to the software system used by the North Carolina Board of Science and Technology to search the NASA files of some four hundred thousand documents. The ERIC RIE files were supplied from ERIC Central through the North Carolina Research Coordinating Unit. Then, the Science and Technology Research Center (STRC), the operating area of the Board of Science and Technology, was able to produce a one-hundred character title and ED accession number output on the total RIE file during the summer of 1969. This form of output was satisfactory to research-oriented institutions because they had ERIC microfiche and abstract journals on hand. However, this project required an output which had the option of printing abstracts and more complete citations for the LEA's which did not have ERIC microfiche or journal collections. Therefore, the project proposed to support development of these options and the CIJE file with citation output when it became available from the ERIC contractor.

The rest of the SEA had three major means of dissemination. One department dealt with publications and public information in telling the story of education in North Carolina. Working with SEA consultants in meetings or problem-solving sessions was a second and quite popular means of dissemination. Another popular method of dissemination was to mail information such as curriculum guides and newsletters directly to the LEA's.

In summary, the project utilized a library which did not stop at collecting information. This "library" became a research and information center where collating, packaging, and processing were done for the State agency staff.

The dissemination service was available to other educators on a limited basis. Secondly, a computerized information retrieval system for the ERIC RIE file was located within twenty miles of the State Educational Agency. With support and cooperation from several agencies of federal and state government, these services could be improved and made available to educational decision makers in the North Carolina public school system. Finally, other departments of the SEA were found to be disseminating information chiefly through mass distribution and person-to-people "workshops."

Another ingredient required for profitable implementation of a model system was a pervasive philosophy of dissemination. The model's theme and purpose, which follows, was oriented toward people, not mathematical techniques.

Development of a Problem-Solving Approach

The overall purpose of dissemination is to make the consumer aware of a new way of doing something. The process of dissemination, in and of itself, does not purport to effect change in schools but to create widespread awareness of the existence of an "invention." Awareness alone, however, guarantees neither understanding nor action. Increasingly, it is felt that the dissemination activity should go beyond mere information. In fact, if dissemination activities are to be most effective, some system or mechanism must be developed to provide a means whereby awareness and interest in an area can be followed by more and different forms of information resources. The stages which follow awareness are crucial to research utilization and implementation.

Realizing that research alone cannot improve education, it becomes difficult to justify the costs of research if newly produced knowledge is not made available in suitable forms for other researchers, developers, and practitioners. It makes little sense to design, develop, and test new products and processes unless educational professionals are made aware of their availability. Innovative

practices have influence only as effective communication about them is established.

"Messages" or research findings which have been refined are designed to inform, to motivate, and to facilitate; yet, all of these "messages" are extremely difficult to package. In view of this difficulty, the threshold of permissible ignorance has been inexcusably high for too long, with too much dependence on "local wisdom" and "walking books." For the most part, education has not used available information systems, such as those developed by Mental Health, ERIC, Medicine, et al.

Critics of educational research, who claim that much of it has been inert and non-relevant, may, in fact, partially be pleading for improved packaging and dissemination. Effective dissemination of facts and new knowledge should be the basis for intelligent planning and decision making. This very essence of planned educational change is gaining continuously in acceptance.

It is increasingly apparent that educational research needs additional linkages to facilitate dissemination, diffusion, and adoption. The growing demand at the grass roots level for effective dissemination and the acceptance of this concept among educational leaders suggests that we may be entering a new age in education.

Presently, dissemination is regarded as a sending and receiving process. "Messages," as well as techniques for their dissemination, utilization, and evaluation, are being cooperatively determined by sender and by receiver. This people-to-people process is gaining favor as an effective way to bring about a better understanding of dissemination. At the same time, less confidence is being placed in dissemination as primarily a language-media process and as having major interest to the sender alone. In implementing this people-to-people process, personal relationships involving researcher, disseminator, and practitioner will be emphasized as a primary basis for improving educational experiences.

The evidence is quite encouraging that practitioners -- administrators and teachers -- respond positively to the dissemination of promising practices and procedures. This is especially true when the audience is prepared for "messages" and for the implementation of "messages."

Knowledge utilization is a part of the problem solving process which begins with a need and ends with satisfaction of that need. Although there has been little research with the problem solving model, it represents basically a "user-oriented" approach to problems. Five strengths of the problem solving model have been reviewed by Havelock:

- the user's world is the only sensible place from which to begin to consider utilization
- knowledge utilization must include a diagnostic phase where user need is considered and translated into a problem statement
- the role of the outsider is primarily to serve as catalyst, collaborator, or consultant on how to plan change and bring about this solution
- internal knowledge retrieval and the marshalling of internal resources should be given at least equal emphasis with external retrieval
- self-initiation by the user or client system creates the best motivational climate for lasting change

The latter statement is the core assumption of the model Research Dissemination System. Self-initiated change has the most secure motivational basis for maintaining an innovation as part of routine behavior. The educator will be more likely to internalize a change that he sees as his own, something that he has accepted by his own free and deliberate choice to meet his own specific needs, and something that he has worked on himself to adapt to his own specific needs.

Proposed utilization of that which is disseminated often poses a threat to practicing educators; for this reason, every effort possible will be made to assist in the creation of a threat-free atmosphere among practicing educators in

order that meaningful innovations or changes might take place. Increased flow of information into situations in which there is little understanding of how to use this information serves only to deepen resistance to change.

Understanding of disseminated information can be improved only to the degree that a person is able to place the disseminated information into his own environment and to use this information to enhance his own position in the environment. Dissemination that conveys empathy for the worth of the listener is particularly supportive and defense reductive. Reassurance results when a message indicates that the disseminator identifies himself with the receiver's problems, shares his feelings, and accepts his emotional reactions at face value. Differences in talent, ability, status, and power may exist, but the disseminator and receiver must minimize these differences if the educational climate is to be open and non-threatening. In the implementation of the model, every effort was made to emphasize this realistic concept.

Though administrators and teachers respond positively to the dissemination of promising practices and procedures, too often enthusiasm for change is dissipated through apprehension, lack of know-how, lack of personnel, and other real or imagined obstacles. Regard for these facts should be kept constantly in mind as intelligent means are sought in the area of audience preparation.

A number of research studies on small group behavior suggest that the attitudes, beliefs, and knowledge of receivers are keys to effecting change in behavior. For example, if a group is cohesive -- that is, working as a harmonious team -- then dissemination through group leaders can be quick and effective; but if the beliefs and attitudes of a group are incongruous, much more time is required for the individuals to restructure their perceptions.

Research has also shown that the superintendent, for example, is a key person in planned change and therefore a key person in the dissemination hierarchy.

His conversion is worth considerable time and effort, since research indicates that in his legitimate power role he exerts influence over large segments of the community. He can serve either to block or expedite any innovation.

In North Carolina, one missing link to a model system for state educational agencies was a component to provide field services and training to these groups and their leaders in local educational agencies. In projects of a similar nature, this component was replaced with an awareness bulletin to teachers and an increase in staff size for the information center. Another project placed a full-time "change agent" at the local level to help develop awareness and coordinate information requests. There are difficulties and benefits from both these approaches. The first method which parallels the majority of dissemination from state educational agencies has the benefit of being inexpensive but suffers from theoretical problems already described. Operational problems also plague this method which is sender oriented. They are:

- the material is received in a large volume of mail. That is, the distribution of the message often breaks down and personnel who might use the information often do not receive the material.
- the description of research utilization services is often glanced over by chief administrators who perceive the bulletin to describe a library service in which they have little interest
- the approach gives the teacher a feeling of bureaucracy rather than personal responsiveness
- only those teachers and leaders most interested in change will follow up the announcement

The second effort parallels the county farm agent model of dissemination. In this model someone at the local unit daily works on problem solving through awareness and coordination of research utilization. The model has been extremely

effective in agriculture for disseminating information on new research as well as improved practices. Two problems with its use in education are role definition and cost. Many school practitioners are recalcitrant concerning research findings which could be of practical value to them. They do not conceive of the scientific method as having any significance to their work. Hence, a low priority is assigned to the process and utilization of research. These educators are often suspicious, fearful and timid about innovative work done in other states, counties, or even nearby local units. Contrast the attitude toward research utilization in education with that in agriculture. Farmers look to the county agent for the latest information on innovations and improvements in farm practice. They depend on his services in their total management program. With an information specialist at each county, these problems in education might be overcome in a few years. However, associated with the role problem is the very real one of cost. This type individual and his support is expensive. In North Carolina, such an operation all 100 counties would be a multi-million dollar effort.

The model used in this project could be characterized, in some ways, as a compact, economy version of the county agent model. In North Carolina a large portion of educational programs and policies are determined at the local level. There are 152 such administrative units in the State's 100 counties. Research in other states with similar school management organizations shows that the local superintendent and his assistants are the keys to successful innovation and change at the local level. Therefore, a great deal of effort was placed toward working with these chief decision makers and their LEA staff on the benefits which might be realized from the utilization or research information.

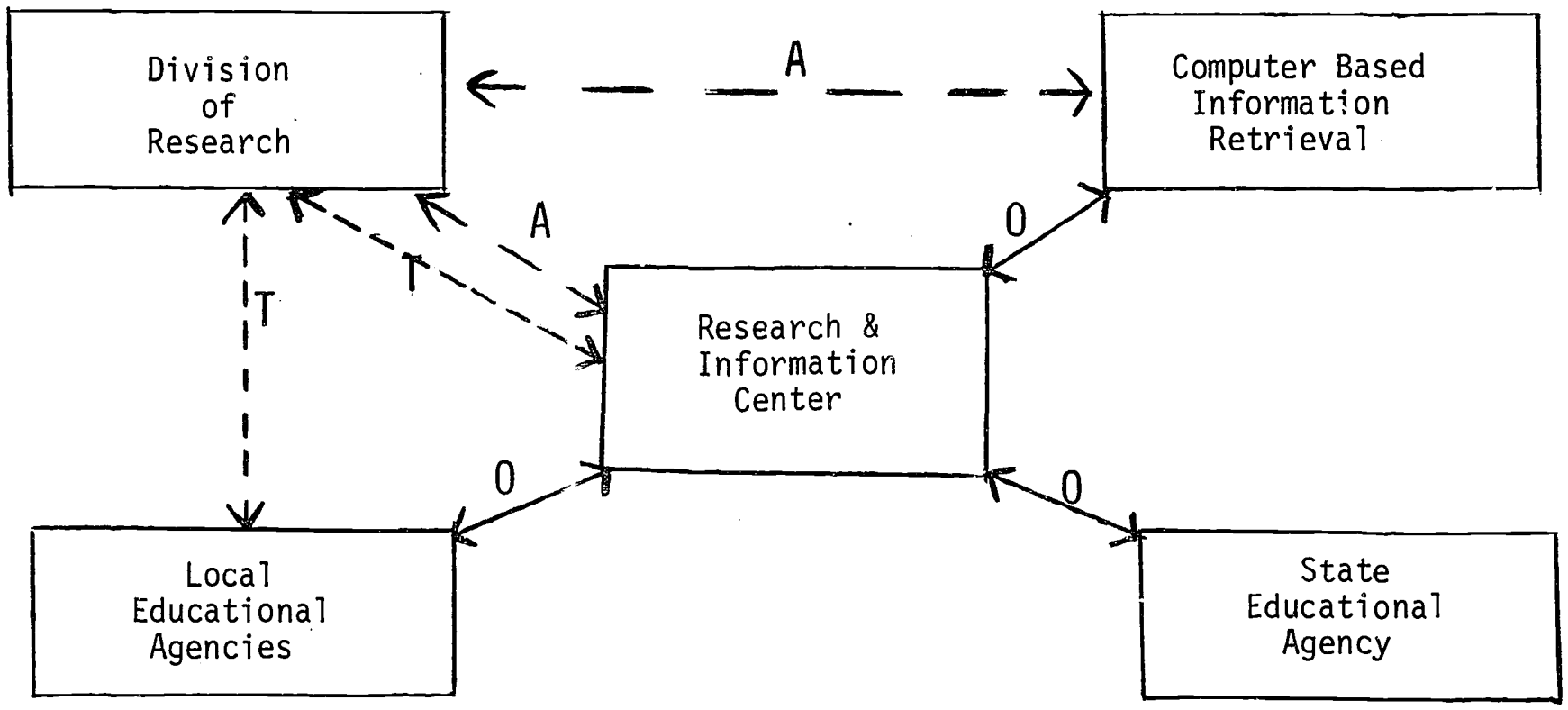
Success in this effort with the superintendent would be followed by joint discussions of two special problems. The first was locating someone on his

staff to act as contact person for processing and coordinating requests for information. This "information specialist" represented the project as a "county agent." Secondly, a time schedule for providing project services to various levels of the LEA organization was discussed. That is, he was asked when his LEA might want to begin services outside the central office staff to the principal and teacher levels.

Thus, the project model called for the local educational agency to designate one of its own staff to be the "change agent" or county farm agent type of individual. Since this person already had a full-time job, the model called for a considerable but not overwhelming effort to help this individual become empathatic with the project and with the leadership role that he would assume.

In order to review the development of the model for this project, note that the basic elements involved an information system in the State educational agency and a field services or dissemination component through the local educational agency. Previous research indicated a need for involvement by LEA decision makers; however, placing an individual on each LEA staff would have caused the model to be cost inhibitive. Therefore, the model in North Carolina added to or changed some of the duties of an LEA staff member in a manner that helped this individual to become a coordinating source for information on research utilization.

In the following chart of the organizational scheme and linkages for the model dissemination project, A represents an administrative linkage; T, a training linkage; and O, an operating linkage.



Basically, the model would operate in this manner for the satellite centers:

- Someone who wanted information (student, teacher, principal, LEA staff, or school board member) would describe this request to the LEA information specialist who would then discuss the information need in some detail and relay the negotiated request to the Research and Information Center in the SEA for processing.
- At the RIC the research analyst would handle the phone or mail request and discuss the question with the original individual by phone if further negotiation was necessary.
- Having completed the necessary negotiation, the research analyst would consult the several resources of the Research & Information Center, the SEA consultant with responsibilities in the area of the request, the computerized ERIC files, or a combination of these resources.
- Finally, a repackaging of these materials which might include copies of articles, bibliographies, ERIC microfiche, and a list of resource people was completed by the research analyst. The package was then mailed to the LEA information specialist.

Responsibilities and Procedures

Before the model system was made operational, a systems analysis for the entire model was conducted to insure the most effective system both in terms of cost and time. From this study, done with the assistance of a professional systems analyst, a procedures manual was developed for the Project Model. (See Part IV for additional details.) The duties and responsibilities of each element of the system were spelled out. The necessary operating procedures and forms for project reporting and evaluation were also developed. While the system

study did delay the beginning of the project's services, it was a significant element in the construction of a model system and the project staff endorse its use to those considering similar endeavors.

The Division of Research was to play the major role in developing the services for the local educational agency as well as overall project administration and training. Implementation of the project's conceptualization of a problem-solving model for research utilization required the development of a series of training packages. The essential purpose of these packages was to enable either research analysts or information specialists to provide information to the person who needed it when he was ready to recognize that need. On-site visitations were conducted to provide awareness of the services available through the project. These visits were intermeshed with the training sessions for the duration of the project.

The Research and Information Center acted as the heart of the operating model. Within its domain fell the responsibilities for preparation and additional negotiation of problems for manual or computerized processing; dissemination of those results which might be of interest and value in the solution of problems; and on-site training or supervision for the research analyst and secretary used in this project. In addition to the secretarial and research assistance, the RIC received a microfiche copier which enabled the requester to receive rapidly a copy of pertinent ERIC documents while leaving the entire collection undisturbed for other requests.

The Science and Technology Research Center (STRC) made certain computer-based information retrieval services available to the project. These services included keeping both ERIC files updated, developing RIE output options of either abstracts or citations, and data processing services, as well as general data management and systems maintenance. These individuals also shared their wealth of experience

in computerized information retrieval and question negotiation which had been developed through the years while working with industrial clients.

The State Educational Agency also operated under a slight modification of services. Prior to the beginning of the project, most RIC requests came from SEA staff. Therefore, it was not necessary for Research and Information Center personnel to interview other SEA consultants since the questioner could locate and discuss his need with them quite easily. However, in order to provide LEA clients with information from this knowledge source, it was often necessary for the research analyst to conduct an interview. After briefly discussing the project, the analyst would describe the information request and the types of information which had been located at the Research and Information Center. Then the analyst would follow up on any information leads or sources the consultant suggested. Often the letter which accompanied the "package" of materials back to the LEA would inform the local educational agency of a resource person who had some interest and expertise in area of their question. A copy of this letter was sent to the SEA consultant to serve as a record of a recent effort on behalf of that LEA in his area of responsibility. Furthermore, the interviews were expected to increase SEA awareness and use of the total resources available through the Research and Information Center.

Strategy for Satellite Center Involvement and Training. Four phases were developed for working with the five satellite centers:

Phase	Activity
I	Plan and conduct first visit with LEA Superintendent
II	Meet with "information specialist" to discuss the project and his role in it. Conduct comprehensive information search using all the resources available within the model as an example of services which could be rendered.
III	Conduct awareness meeting with entire LEA central staff
IV	Prepare for SEA training and conduct follow-up field services

The project director and systems analyst made the initial visit to the Superintendent (Phase I). In the discussion it was stressed that the project would be providing better information to local decision makers through the establishment of satellite centers of the Research and Information Center. Should he be willing to allot the responsibility for negotiating the information requests to a member of his staff, the project staff would assist that "information specialist" with equipment, materials, and training. Furthermore, the project would support the cost of gathering the information from the several resources of the State Educational Agency. The project staff also indicated a desire to see the service provided to those levels of administration (central staff, principal, or teachers) which would have an effect on the greatest number of students. Reaction to the project varied:

- "We will try it for awhile and see if it puts too much work on our staff."
- "One of the best ideas the State Department of Public Instruction has had in years."

All superintendents preferred to work this year with the LEA central staff primarily because (1) they wanted the "information specialist" to get a feel for the work required, and (2) information from the project on system-wide problems would affect more students.

Following their conference with the Superintendent, the project staff began Phase II by meeting with the "information specialist." During the meeting, the following topics were discussed:

- better information could be made available to fellow decision makers through this project
- his support team in the SEA and the resources available to him through this staff
- his present duties and the amount of his time required to help get the information request started

- the procedure for the negotiation of an information request on a topic suggested by the Superintendent was simulated
- the equipment, reference materials, and training he could receive
- plans for a return visit to meet with him and the entire LEA staff if possible

The Director of the Research and Information Center and the new research analyst assisted in a comprehensive search for information on this question in vertical files, books, reference materials such as PREP, research reports, and the ERIC files. State Educational Agency consultants who had expertise in the area were also located and questioned.

The package which was returned to the "information specialist" usually included:

- copies of the better materials (magazine articles, PREP kits, etc.)
- reference to other sources
- pertinent ERIC abstracts (or microfiche)
- names of resource people the LEA might wish to contact

Phase III was a meeting, with as many of the LEA staff as possible. The project's effort to provide them with the best information available through their own "information specialist" was discussed. After reviewing the Superintendent's request and development of an "answer" at the Research and Information Center, other questions were solicited. It was possible to show that most information requests began as rather vague and required ten to fifteen minutes of refining negotiation. The information request form required less than two additional minutes. The LEA staff members were encouraged to:

- discuss their big information needs with the "information specialist"
- mail in their requests
- use the phone whenever they felt the need was great enough
- give a frank appraisal of the usefulness of the service and the "packages" which they received

The entire project staff again worked with the research analysts in locating and repackaging pertinent resources on each topic.

Phase IV included a problem session in the State Education Agency where the satellite information specialist could:

- meet the research analysts and other Research and Information Center staff
- discuss problems with other satellite information specialists
- follow the processing of an information request
- visit and use the RIC facilities and equipment
- obtain any equipment or materials they had not received, such as:
  (1) portable microfiche reader
  (2) a thesaurus of ERIC descriptors
  (3) a frequency-of-terms catalog for the RIE and CIJE files
  (4) ERIC reference materials
  (5) RIC reference materials and forms

After the meeting, the research analysts conducted follow-up visits once every two months to:

- be of general assistance on information problems
- stimulate questions from other LEA staff members
- gently push for the extension of services to principals and teachers

One of the more important goals of this model was providing someone on the LEA central staff, who was seen as an information specialist, with access to a team of individuals and resources dedicated to providing him with the best information available. The project staff prepared a reference manual for him which contained sections on question negotiation, the retrieval system, and ERIC. (See Part IV for further details.) An additional manual was prepared for his use with local school contact persons, should his LEA decide to proceed in the direction of providing services to principals and teachers. (See Part IV for further information.)

The project staff avoided any inclination to hurry the conversion of these "information specialists" into full-time information linkers or change agents. Experiences with similar projects indicated that role changes of this type, in organizations similar to the LEA central staff, are quite individualistic and should proceed as that individual is ready to handle the role. Therefore, it was emphasized throughout the training that the LEA information specialist had an information team behind him as he tried to help the LEA staff solve problems. Should he want to expand the services to the teacher and principal levels, the project staff would willingly assist him with in-service materials and resources.

Strategy for Training of Research Analysts. There were two parts to training the research analyst. The first part involved on-the-job training in the various functions and resources of the Research and Information Center. The second part involved developing knowledge and understanding of the computerized retrieval process, the manner in which the model serviced the LEA's, and the approaches to repackaging information. Training about the RIC was the responsibility of the Director of the Center while training relating to other aspects of the Model was the responsibility of the Division of Research.

The on-the-job experience in the RIC included the opportunity to work with:

- on-site visitors and other SEA clientele
- microform collections
- standard reference and library collections
- extensive vertical file collections
- ERIC products
- news and research services
- evaluation of incoming pamphlets and materials
- preparation of RIC publications like Emphasis and annotated bibliographies
- operation of standard copiers as well as a variety of microform equipment
- acquiring and making information resources available to RIC users

The Director of the RIC supervised the daily procedures of the information analysts and was able to conduct their training at various times during the project.

The Division of Research was responsible for the second training phase which was divided into three sessions. Initially, each analyst was involved in a discussion of the model research dissemination system and his role in it. This discussion was supplemented with a copy of the procedures manual. A follow-up session was held to discuss questions about the model and to introduce the information analysts to the computerized information retrieval system. Several search strategies were prepared and critiqued. Next, the analysts and project staff joined in cooperative efforts on questions generated during visits with the LEA superintendents. The training in this part concerned:

- question negotiation
- interviews with SEA consultants and other experts
- the variety of sources of information available through the RIC, computerized files, business and industry, and other research collections
- repackaging of materials for several audiences when the analyst is not an expert in the question area

The third part of the training was accomplished through a formal presentation, supplemented by a technical reference manual (See Part IV) on computerized information retrieval systems. Comparisons were made between inverted file and linear software systems. The inverted file system which the project used is cost effective and represents an alternative to reduced file coverage as the data files become larger and more expensive to operate under linear searching systems. As a part of this presentation, the form containing the searching logic was physically followed as it went through the steps required for processing and computerized output.

The computerized search went through the following general procedure. The research analyst received a request form with a short sentence or paragraph describing the information need. Hopefully, the sentence had been prepared using

an ERIC thesaurus and contained ERIC descriptors and identifiers. The analyst would then decide whether a new search was necessary by comparing this information need with material on hand and other computerized searches on file.

If a new search was necessary, he would:

- expand the number of related terms using the ERIC thesaurus whenever his experience or the STRC frequency of terms dictionary indicated a small number of documents would be available
- group the related terms together and use the Boolean algebraic expressions for union, intersection, or negation to form a logical equation or search strategy. For example, if the requester wanted materials in vocational education for elementary age children, the analyst would have intersected a group of terms related to vocational education (Group A) with another group of terms related to elementary age children (Group B). The logical equation would have been (A) · (B). Therefore, the computer would have selected only those ERIC reports which had at least one terms from each group in its list of descriptors and identifiers.
- the descriptors and identifiers used for this search were reported on a search strategy form. This form was carried by courier to Science and Technology Research Center located in Research Triangle Park, N.C., for processing.
- the computer output was returned to the analyst who might review all of the "hits" for his search to select those germane to the information request.

During the project's development, the Division of Research continued to work with the analysts on repackaging experiments, site visits to the satellite centers, and solution of problems with any part of the system.

Administration of the Computerized Retrieval System. Although a considerable amount of time was spent working out the cooperative effort which permitted the project to use a very fine software system on one of the world's larger computers, this method was recommended instead of operating a simpler system on State-owned computing systems. The benefits of speed and flexibility were gained and the project was not encumbered with problems of data management, additional personnel, or competition for services from State Government.

The system had proven too expensive for operating in the real time mode. For this reason, remote job entry processing was utilized. Several approaches were tried in processing and sending the search strategy to the retrieval system. The processing primarily involved key punching and program preparation. The best service was provided through a courier service that picked up search strategies at the Research and Information Center and delivered them to the processing center some twenty miles away. The processing center then prepared the computer cards necessary to operate the logic program and the software system. The courier returned the results to the RIC as they were completed. The turnaround time via courier was approximately 24 - 48 hours.

The salient feature of the project's retrieval system was its access to a superior retrieval service via the Science and Technology Research Center. Many problems were anticipated and either avoided or resolved because of their previous experience in searching other data files.

In summary, this section has detailed the responsibilities of each component of the model. Some of the strategies and procedures followed in implementing the model have been described. Furthermore, the general background and development of the model research dissemination system for state educational agencies has been discussed in some detail. The next part will be an evaluation of the model system through an analysis of the services which were provided -- computerized information retrieval, Research and Information Center dissemination, and liaison and research utilization.

PART III EVALUATION OF THE MODEL

The evaluation of the use, service, and response to a sophisticated information dissemination system is dependent upon the several characteristics of the user group and its requirements for information. Therefore, to assess the effects of this project, the evaluation will report those measurement functions of usage and service which are quantitative as well as an assessment of those which are qualitative. The evaluation report will be organized into four studies of the services provided by the operational model. First will be a report on the user group and retrieval function. The next study will report user attitude and response to the dissemination process. The remaining project objectives will be discussed in the third study of liaison and research utilization. Finally, a section on findings and recommendations will conclude the evaluation report.

Computerized Information Retrieval

The first general objective involved field testing an inverted file computerized retrieval system for searching both the ED and EJ ERIC files in cooperation with the Center for Occupational Education.

Three general dates should be remembered in discussing services to the LEA's in general and computerized searches in particular. The first information request from an LEA under this project came in October. The secretary and research analyst with particular responsibilities to the local educational agencies began work in October and November respectfully. The option of abstracts or citations on the RIE file and the ability to use the CIJE file began in November.

The evaluation of the first objective, a summary of the computerized information retrieval statistics, will follow. In addition, a summary of those questions on the User Evaluation Form which relate to computerized output will

be reported. This user evaluation form was mailed to the requester six weeks after the "information package" was mailed from the RIC.

Computer Output. Using the experience of analysts, project staff, and the small number of LEA searches in October, it was determined that the complete abstract output provided superior information to the one hundred character title. That is, each individual interviewed felt he was able to make better decisions on the relevance of a particular ERIC document to his information need by having access to the abstract as a part of this output.

A modification of service was required because the superintendents elected to utilize the services provided by the project within their own LEA staff for this year. Instead of returning only computer searches or materials readily available at the Research and Information Center, the decision was made to offer more comprehensive services for as many of the questions as time and need for the information would permit. The comprehensive service was comprised of computer search, RIC resources, and interviews with experts in the area. Furthermore, the superintendents' decision provided additional time for experimentation with repackaging. Results of these experiments will be discussed in the section on dissemination. This section will first present statistics on services provided and follow that with a cost analysis section.

The services which related to the computerized retrieval on the ERIC files represent only about ten percent of the searches done by the RIC but nearly ninety percent of those provided to the LEA's for their comprehensive packages. The first statistic which may be of interest is a very crude index of visibility which represents the actual number of bibliographies done each quarter for the satellite LEAs and those which were generated by other clientele of the RIC.

Quarter	Satellite LEA's	Other RIC Clientele
2	14	22
3	12	23
4	17	90
Total	43	135

Heavy reliance upon the number of searches is weak as an evaluation device in that it shows neither the end result of the search, the number of times it was used, or the estimated size of the affected audience. The number of times a particular search was used with a different client was difficult to capture in that no effort was made to follow the distribution of "packages" of materials. However, each individual making a request for computerized information retrieval made an estimate of the number of persons who would be directly affected by the information.

Type of Agency Requesting Searches	Range Within Quarters for Average Estimated Number of Persons Affected by Information
Local Educational Agency	68,833 - 92,685
Colleges and Universities	249 - 736
State Educational Agency	242 - 1,892

As can be seen, local educational agency requests are reaching from one hundred to three hundred times as many people as other agencies. What were they doing with the information? The answer was quite individualistic. Some LEA staff members were gathering data for long range planning such as "cost-effective construction and the community school." In one LEA the entire staff was working on tremendous projects in school-community relations and were looking only to the

ERIC searches for ideas. Another LEA was working on integration and human relations through questions on "how to make the school friendly" and "how to make the curriculum and grading relevant to each child." These were questions which affected almost every child in the LEA and required a comprehensive information package from the State Educational Agency.

One factor which led to smaller audiences for the other two groups was the large number of individuals who were using the materials "for personal information." In reviewing the purposes for which the information was to be used almost one half were for "graduates courses I am taking (or teaching)." The other half were for projects being proposed and projects just getting underway. It must be stressed that the questions of service and utilization are quite complicated and individualistic. Thus, an effort was made during the negotiation period to determine the purpose and estimated effect of the information in order to allocate project resources and services more effectively.

The number of individuals in certain positions or occupations who requested services through the RIC changed from the second to the fourth quarter in local educational agencies and satellite centers.

Local Educational Agency Searches

Position	Number Per Quarter		
	2nd	3rd	4th
Superintendent	3	2	
Assistant Superintendent	6	3	1
Supervisor	4	3	7
Project Director	4	2	1
Principal	1		1
Counselor			1
Teacher	1		3
School Board Member			
Other		2	

Although the figures are small, there appears to be a trend toward increased usage by supervisors, teachers and principals and a decrease in usage by superintendents and assistant superintendents.

College and University Searches

Position	Number Per Quarter		
	2nd	3rd	4th
Administrator of Research Programs	2		(5)
Research Associate or Project Director		2	1 (5)
Graduate Research Associate			(7)
University Faculty	2	1	14 (7)
Graduate Student			4 (22)
Undergraduate Student			(1)
Department Head		1	
Library or Other Staff			
Others			
TOTAL	4	4	19 (47)

The numbers in parentheses represent the people requesting services at the sixth satellite center, or university center, during the fourth quarter. "Free" services were provided within the university's education building by a research analyst. This center provided the project with an indication of usage from individuals satisfying term paper requirements and professors developing new courses and projects. As can be seen, they made extensive use of the ERIC files. However, the average estimated audience which would be directly affected was less than ten.

North Carolina State Department of Public Instruction Searches

Area	Number per Quarter		
	2nd	3rd	4th
Executive Staff	4		1
Program Services	9	5	16
Research, Planning, and Development	10	7	18
Administrative Services		1	2
Special Services			5

Note the "doubling" effect between the second and fourth quarters and the characteristic lower third quarter for all areas. The drop experienced in the

third quarter for the period December 1 through February 28 for all three groups is one which the professionals at STRC have also found to occur annually with their industrial clients.

Usage of the computerized retrieval services has been described through counts, affected audience, and type of user. The next element will describe the typical computer search.

The following data represent the average RIE and CIJE computer searches on the total ERIC file. The numbers in parentheses are the range of quarter averages.

Average RIE Search

A. 16 terms (13 - 18)

B. 3100 postings (2781 - 4149)

C. 70 seconds Computer time on IBM 360/75 (67.8 - 71.9)

D. 108 "hits" (101 - 276)

E. 5 - 20 very relevant documents

Average CIJE Search

A. 15 terms (12 - 16)

B. 1300 postings (1228 - 1440)

C. 35 seconds Computer time on IBM 360/75 (31.7 - 37.2)

D. 40 "hits" (37 - 45)

E. 1 - 5 very relevant documents

Postings are the number of ERIC documents in which a term has appeared in the descriptor or identifier list attached to each ED and EJ document. The retrieval program first reduces the total number of documents which must be examined from over forty thousand to 3,100 for the RIE file and 1300 for the CIJE file. The program then solves the logic equation and presents a "hit" list. This "hit" list has reduced the number of documents to be reviewed by another 97%.

The relevancy of this "hit" list was determined through the User Evaluation Form. It was found that twenty percent of these "hits" are very relevant to the information request.

The final parameter of service relative to computerized retrieval which will be discussed before beginning the cost figures is time required for service. The initial interview, negotiation, and forms completion requires three-quarters of an hour on the average with a range of ten minutes to an hour and a half. The amount of time between completion of the search strategy form and return of the computerized output has varied from two hours to one week.

Several components were experimented with during the first two quarters. Transportation, keypunching, and speed of return were arranged in several different ways. These various configurations produced differing amounts of speed, convenience, and cost.

The project's decision to use the courier for transportation and STRC personnel for keypunching was aided by the discovery that while many requesters maintain they need immediate results, they are quite satisfied with results in a two or three day time period. Further study revealed that the majority of these people wanting computer searches were not requesting them for immediate usage such as speeches or interviews, but rather for information or projects they were going to be working on for several weeks or months. Thus, it was evident that a two or three day turnaround on computerized retrieval would satisfy the majority of needs. Prompt service could be arranged through another configuration and produce results within a few hours if the need demanded it.

The time lapse from the formulation of a query to receipt of the information package averaged a week or ten days for phone or mail requests from the satellite centers. It should be remembered that several concurrent activities were accomplished and merged during this period. The actual time spent on any particular question averaged three to four hours for interviews, manual searches, review, and repackaging.

Costs. System costs are available from the Science and Technology Research Center but determining the share to assign this project would have been a complex undertaking. Proration of the initial software development, facilities, and overhead was waived through a cooperative arrangement which allowed STRC to make the ERIC file available to their other clients and allowed the project to use the STRC software system.

CPU time, by itself, is quite misleading. Larger machines simply run faster at a higher rate. The cost formula on the IBM 360/75 changed during the project to one which charged for CPU time, amount of core used, and number of unit record executions. Translating this to a general figure like cost per second of CPU time resulted in costs of 11-13 cents per second for ERIC searches. When error rate and two-part computer paper were averaged over the searches completed, the machine time cost was raised to 13-15 cents per CPU second. Although the two-part paper was more expensive, it proved the cheapest way of providing the Research and Information Center with a file copy of all computer searches.

The cost tables which follow include no personnel overhead and use generalized cost averages in order to keep the data in a realistic framework.

The entry for "programmer cost" includes pickup of the request by the courier, preparation of a load sheet and program cards, review of spelling and postings, keypunching, and pickup and delivery of computer input and output.

Similarly, "computer overhead" covers update cost, disk pack rental, tape conversions, and purchase of magnetic tapes. An annual figure of $1500.00 corresponds to $1.25 in overhead for some 1200 searches completed during the past year by STRC, the Research and Information Center, and the Center for Occupational Education. Actual overhead costs to the project were lower each quarter because ERIC Central provided up-date tapes to the project and the number of disk packs grew from one to five as abstracts and the CIJE file were developed. Thus, for

1200 searches, the $1.25 represents the average-per-search overhead for up-date tapes, updating the system quarterly for both files, five disk packs for one year, tape conversions, and tape purchases.

Cost Information for Computerized Searches

A. One Average RIE Search

1.	Computer time 70 seconds	
2.	Computer cost @ 15¢/second	$10.50
3.	Computer overhead	1.25
4.	Analyst time (for additional negotiation, form completion, etc.) 3/4 hours @ $3.50/hr.	2.63
5.	Programmer cost	1.00
6.	Total	$15.38

B. One Average CIJE Search

1.	Computer time 35 seconds	
2.	Computer cost @ 15¢/second	$ 5.25
3.	Computer overhead	1.25
4.	Analyst time	2.63
5.	Programmer cost	1.00
6.	Total	$10.13

C. STRC Estimates for Computerized Printing of Abstracts and Citations

1.	RIE abstract file	$ .085/abstract
2.	CIJE citations	$ .028/citation

To evaluate the cost aspect of the retrieval system, similar figures would be required from other projects. One figure on CPU time was made available at an ERIC tape users conference held during November in Raleigh. Forty dollars was the average amount described for CPU time using linear searching programs. One project did report a value of five dollars. However, later discussions revealed this search was done on the last year's RIE numbers and that the cost was amortized over the number of copies made of the search. The latter point reflected the finding that many requests are made for the same topic. Therefore, making several copies of a search reduced the per-search-cost to below five dollars. Obviously, more details are required in order to make meaningful comparisons. Another figure, available from STRC, revealed that their analysts, who are professional engineers, take approximately the same amount of

time to prepare search logic steps as the research analyst at the RIC. The engineers earned about three times as much per hour as the analyst. Two favorable comparisons are not enough to draw firm conclusions -- rather, an advantageous trend is suggested. Future reports from other projects must be awaited to affirm or deny this trend.

The evaluation form used with the satellite centers revealed eighty percent of them in strong agreement with statements on "readability," "usefulness," "delivery," and "worth the cost." Fifteen percent agreed with the statements. The remaining five percent were in strong disagreement with the "usefulness" statement. These particular searches, it seems, produced "hit" lists of two hundred or more. The fault lies either with the analyst in negotiation and search logic or with the user in not realizing what he might receive when he asked for information such as "everything on individualized instruction."

Suggestions for modifying the retrieval services are contained in the section on findings and recommendations.

Research and Information Center Dissemination

It should be remembered that a retrieval system is a pointer only, and that the sum total of value tends to zero if the user takes no action upon the results obtained. This section will examine the second objective: soliciting and servicing research and development information needs of educational practitioners. The majority of this effort was accomplished through the RIC Center. After a review of the regular operation and services of the RIC, the discussion will center on the comprehensive search package -- its costs and results. The section will conclude with a report on the results of a special repackaging effort.

Remembering that 95% of all information requests in the RIC are handled manually should assist in putting the operation of the model into perspective. The fact that 90% of the satellite center requests did require a computerized search may reflect the difference between the specific SEA request and the broader

LEA questions. On the other hand, the need for computerized searches by the LEA's may suggest innovative leadership since a new search was not prepared if one was available.

Although the majority of RIC users are SEA members, other educators who are visiting the state department for various purposes often seek information from the RIC. Some of these individuals come to do their own research where facilities and equipment are easily accessible. When RIC staff time is required for visitors or SEA members, the information requests are usually specific enough to be answered in a few minutes. Books, magazines, vertical files, PREP materials, computer search files, and research newsletters are valuable resources for answers to these questions. A few users want reviews of the ERIC files for particular subjects. Materials from Leasco, an ERIC contractor, and ERIC Indices are useful tools for manual searches. The Leasco publications (inverted file printouts) are extremely helpful in locating reports on subjects with few listings in ERIC.

The information below pictures an average month of RIC activity excluding the computerized searches that were described in the previous section. The final entry depicts any use of the ERIC materials for brief manual searching, copying material from microfiche cards, duplicating cards, computer searching, reading reports, or checking out a portable microfiche reader.

Average Per-month Usage of RIC Materials and Equipment

1. 600 requests for non-computerized material
2. 306 pages printed from microfiche-microfilm reader-printer
3. Number of microfiche reproductions
   a. 83 complete reports
   b. 148 microfiche cards were actually duplicated
4. 45 brief manual searches of RIE and CIJE
5. 100 individuals who use the ERIC materials in some manner

The comprehensive search used for most satellite center requests has been described previously. The several resources of the RIC were examined; experts in the SEA and surrounding area were interviewed; and computerized searches of both ERIC files were conducted. The information gathering process having been completed, the repackaging process began. If the request had been initiated by a satellite center, the package might include:

- a reviewed search output
- pertinent microfiche
- copies of articles from journals and research newsletters
- references to books and pamphlets available on loan from the RIC
- names of resource people who might have worked successfully with the same general problem
- names of experts in the SEA, local universities, or private enterprise

When the RIC staff determines a distinct pattern in information requests, they prepare additional "packages." Annotated bibliographies, short summaries of research, and even position papers have been developed for these needs. Major repackaging efforts for the entire SEA also depend on the RIC for a comprehensive information base.

An enormous endeavor was recently completed by a team of SEA experts on individualized instruction which utilized every element of the model research dissemination system in gathering information. This "package" included, among other things, television and radio materials, parental and community materials, teacher resources, and a position paper from the SEA. Threads of the adoption process -- awareness, interest, evaluation, trial, and adoption -- were interwoven with threads representing audiences from the student to the taxpayer. The resultant fabric represented superior utilization of research for decision makers at all levels. Packages of this type are expensive and were beyond the fiscal scope of the project.

The majority of information requests filled by the RIC for the satellite centers were by definition aimed at the need of program planners. Furthermore, the materials in the packages dealth primarily with the "evaluation" and "trial" stages of the adoption process. It should be remembered that these results were obtained by design. The project staff directed its services toward those individuals responsible for effecting change for the greatest number of students -- the central staff of the local educational agency. Nevertheless, the superintendents' decision to control the audience did permit a small experiment in repackaging. Based on the belief that research utilization packages should be developed around the theme of an audience interacting with the adoption process, the decision was made to engage in a different repackaging technique. review of information requests suggested that the community school was an area of major concern.

The "awareness" and "interest" steps of the adoption process were applied to the community school concept for as many audience types as possible. Research materials on the community school were to be interplayed with research on what audience needs are in the process of adopting a change. The particular steps of "awareness" and "interest" were chosen because the project manager felt it was improper for a research analyst to prepare the technical detail necessary for the later steps of "evaluation" and "trial." It is even difficult for an "expert" to prepare topics in a manner which is free of burdensome detail yet contains quantitative data for all levels of audience. Research analysts cannot reasonably be expected to possess such "expert" knowledge; rather, a <u>team</u> of experts and writers is required to perform a comprehensive analysis and presentation of the costs and benefits of a community school. Thus restricted by cost and expertise, the analyst who was to work on this package was explicitly charged to prepare a document on the concept of a community school which could be read by a state legislator or "the man on the street." <u>Any</u> reader was to develop an

awareness [illegible]d interest in this concept. Furthermore, there were to be pointers in the package to more technical references which could be used for attaining improved decision making on the community school.

Costs. As the model was developed, cost analysis components were included for more precise forecasting of fiscal needs in the event that the model were implemented state wide. The next table includes cost for an average information request from a satellite center and cost figures for developing the experimental package on community schools.

Comparative Costs for Two Repackaging Techniques

A. One Average Comprehensive Report

1.	A-6 (RIE Computer)	$15.38
2.	B-6 (CIJE Computer)	10.13
3.	Analyst time for review of computer search, manual search of RIE resources, locating and interviewing human resources 3 hours at $3.50/hr.	10.50
4.	Copy cost	1.50
5.	Total	$37.51

B. Special Repackaging Experiment on Community School

1.	Analyst time in review, text preparation, interviews with experts, photography procurement, and editorial work = 240 hours	
2.	Computer searches	$ 25.00
3.	Analyst Cost 240 hours at $3.50/hr.	840.00
4.	Photographs	70.00
5.	Printing of 300 copies	265.00
6.	Total	$1200.00

Whereas the first package represents an average of over one hundred such packages, the second represents an initial effort by the research analyst. A great deal of time was spent learning the procedural requirements of the SEA for publications and photography. The staff feels that similar efforts would average $800.00 or less.

Results. To determine whether the model system was meeting acceptable standards of quality, the user was queried for an evaluation of the packages he received. The user evaluation form contained sixteen questions. Ten of these are attitudes measured on a five point scale from strongly agree (1) to strongly disagree (5). The summaries below represent returns from forty-two comprehensive searches. It is quite obvious they are favorable to the model system.

Summary Table for User Evaluation Form

	Question	Average Scale Score
1.	The entire search procedure was difficult to use	4.45
2.	The service was slow	4.69
3.	The directions were hard to follow	4.71
4.	The research analyst was interested in helping me	1.05
5.	There was too much paperwork	4.61
6.	I was able to get assistance when I needed it	1.31
7.	The computer output was informative and useful to me	1.75
8.	The microfiche or other non-computerized outputs were difficult to use	4.46
9.	The materials were delivered when promised	1.40
10.	The information was not worth the time and cost to me	4.51

Since these evaluation forms were sent to the user six weeks after his "package," the replies to the next two questions provided information on relevancy, time line, and utility of ERIC reports.

11. Approximately how many of these titles have you looked at in an abstract journal (RIE)?
12. How many titles have you looked at on microfiche or ordered hard copies of?

The analysis shows 20-30 percent relevant and 5 percent very relevant. Almost 20 percent of the users indicated the reading of ERIC reports would be done in the future. Thus there is a clear indication of either an aversion to reading research reports or a lack of commitment to the problem. At the SEA training session for information specialists, the latter element was discussed in detail. At the meeting, the topic of repackaging requirements of an LEA central staff revealed two extremes. One group wanted the analyst to review the research reports and prepare a one or two page summary. The other group did not feel the analyst was qualified to do such work. This group seemed to use the research reports for ideas and were afraid the analyst might dismiss a report using an

innovative technique which had poor results on the sample tested. The first group, who wanted summaries, stressed the limited amount of time which they had for reading microfiche or reports.

Obviously, the basic resource under consideration was the analyst's time: even poorly done summaries take much time. Therefore, the "summary" group realized that if a problem was important enough for them to request a half day's work from the research analyst, then they should be willing to spend at least as long on the information. That is, if a problem really needs research information, then it is worth spending time on that information. The "summary" group also felt they needed their own research analyst to prepare summaries, awareness reports, and technical reports for topics of current interest to their school system.

On the evaluation form, questions 13 and 14 measured the quality of the material in two additional ways. The underlined numbers represent replies from forty two users.

Summary Table for User Evaluation Form (Continued)

13. Based on your experience in this area, circle the degree to which you think the titles from the search are representative of the work done (or being done) in this area.
    a) I do not have enough experience in this area to evaluate the titles 18
    b) Very poorly . . . . . Very well

Scale	1	2	3	4	5	6	7
User responses	0	0	1	1	2	6	10

14. Please circle the degree to which you feel the search adequately met your needs.

Very poorly . . . . . Very Well							
Scale	1	2	3	4	5	6	7
User responses	0	2	3	7	3	8	16

Average = 5.26

Analysis of these questions indicates that about half the people do not feel they have sufficient experience in the question area to evaluate the material. Those who do have this experience have discovered the materials selected by the analyst do a good job of representing the research work in this area.

Question 14 is perhaps the critical question on this form. A response of 7, or a statement such as "it met the need," from an LEA superintendent responsible for the educational program of over 100,000 students represents the strongest support possible. In an era of "the public be pleased," most state departments of education find the response to their services by LEA central staffs to be quite candid. Thus, while not as obvious as a letter to the Governor, these responses reflect support of the highest order. Careful analysis of the evaluation responses containing 2's, 3's, and 4's revealed that there was simply no data at the SEA, RIC, or ERIC that could adequately meet the need.

The underlined numbers or phrases below represent replies from forty two comprehensive searches.

Summary Table for User Evaluation Form (Continued)

15. The service could be made more valuable to you personally by:

0	a) reducing the time between search request and abstract delivery
0	b) reducing the time between document request and delivery
5	c) having field services more often
7	d) having a microfiche reader closer to me
4	e) other <u>more familiarity with the system</u>
	<u>output summarized to no more than two pages</u>
	<u>too much material for me to examine</u>
	<u>more time to experiment with information located</u>

This question suggests that 15% of the users would prefer field services more often. (The majority of these requests came early in the project from one

center. The users were getting back more information than they could use. A meeting was held to talk about ERIC and how to narrow searches on topics well covered by RIE and CIJE.) An additional 15% believe the service to them could be made more valuable by having a microfiche reader closer to them. One satellite center reported: "We have had such a demand on the microfiche reader that we bought another one. This too is inadequate. We'll keep working on getting adequate equipment."

The final statement on the Evaluation Form asked for additional comments. Two representative sets of the data will follow. First will be comments from assistant superintendents in all five satellites.

Very well pleased. The service opens many new avenues to me. Thanks.

I haven't read the output yet. You get an A; I get an F. I'll read them in the spring as the time for decision draws closer.

Job well done.

It has been a joy working with you and your staff. We plan to utilize the service on all future projects.

Thank you very much. This has been most helpful and valuable information.

A representative sampling of comments from the satellite information specialists found:

Our fault that we are not making better use of services offered by RIC

The service has been excellent and hopefully more people will be using the service. Those who have used it have been most complimentary of the efficiency.

I can't tell you how much we appreciate getting the materials that we have had so far. They have been in the hands of many people, and we feel are making a real contribution to us. You are a delight to work with.

The supervisors have used these extensively.

Service was a great help; it was easy to use; and the resulting materials were easy to use.

Based on the User Evaluation Form, the model system has provided the satellite centers with excellent service and a good product. Those few individuals who were

not satisfied with some aspect of the service or package tended to be those who received too much information. There were a few cases where service was excellent, but the package did not satisfy the need. One such question dealt with determining achievement: "Can you show that semester tests, criterion referenced testing, or use of performance objectives affects individual achievement? If so, we want some materials or resources to help our teachers convert their 'grading' procedures." Here the resources available to the analyst simply could not satisfy the need. Most of the material located was philosophy or description rather than facts and figures. That is, awareness and interest rather than evaluative materials. Thus, the decision maker circled a four on the need-satisfaction scale. The important issue appears to be a lack of evaluative materials on certain innovative or "popular" concepts in the ERIC or PREP type publications.

Qualitative assessment of service, training, and satellite center usage was determined through on-site interviews with LEA personnel, research analysts, project staff, and SEA consultants. Only one of the information specialists did not mention the severity of the problems with which they found themselves encumbered. The limiting effect on their project effort did not dampen their enthusiasm. In a reasonable amount of time, the project staff felt three of these satellites would become model centers. As time to work with the materials and system increased, dissemination of service and materials was growing. In short, these information specialists found the model system creditable and planned to extend its use next year.

Training of research analysts was better than that of information specialists. Mistakes with the information specialists were primarily due to limited project resources. Three specialists had more problems than anticipated with the role they were to play. To some of them the use of comprehensive information was foreign to the way their particular LEA solved problems. The SEA training and follow-up

visits helped very much with this problem. Unfortunately, these efforts could not be coordinated until the project had been providing services for one quarter.

Seeing these two aspects of encumbering problems and inefficient methods of problem solving as background interaction, one could more easily understand the precipitation of low (in volume) satellite center usage. The wisdom of the superintendents in requesting that services be limited to system-wide problems is apparent. Feedback on products developed as a result of information from the project revealed the same individuality previously described. Those LEA's that included information gathering as a part of their decision making process used the products to save time and to be a resource of ideas. Others were in a search for pragmatic materials developed by educators faced with similar problems. Some important developments resulted:

- Two centers developed new community relations activities based, in part, on project materials
- A dramatic reorganization of one SEA department resulted, in part, from information gathered in response to one satellite question
- Reorganization of the social studies curriculum K-12 in one LEA was greatly aided by information supplied by the system

In summary, qualitative assessment found the satellite centers put the information provided through the model dissemination system for their problems to good use. Some found those materials rich in ideas most valuable, while others found pragmatic materials like curriculum guides most useful.

Community School Experience. An evaluation of the publication on the community school concept, entitled The Community School Experience, was conducted by a survey of SEA and LEA "experts" on the community school as well as the information specialists in each satellite center. The results, based upon a fifty percent return at the time of this report, were interesting. Opinion was evenly divided

on the comparative value of this publication versus twenty to thirty comprehensive searches. Satellite center evaluators did not feel the publication was worth the cost because it was not directed toward solving a problem which they presently had. Eighty percent felt the publication would be important (30%) or extremely important (50%) in communicating this type concept to lay people. Only sixty percent felt this type package was important in selling the concept to educational decision makers. Comments from the reviewing group suggested that the text and pictures should be reduced while the addition of more facts and charts would be required for selling the concept to educational decision makers.

The purpose for the publication, it should be remembered, was to develop awareness and interest in the concept for a variety of audiences. Each reviewer was asked to check the audiences which he felt could use the publication for three decision points. The first was a decision on creating interest, developing awareness; second, on whether or not to implement; and third, decisions on methods of beginning operation. In the steps of the adoption process, these three decisions correspond to "awareness" and "interest," "evaluation," and "trial." The seven audience types varied from "students" through "other members of voting public." In the opinion of the reviewers, the publication could be useful for making the decision on interest and awareness by 70 - 90% of the audience types. The potential for evaluation decisions was estimated at 0 - 60%, with the majority at 40% of the audiences. Only 0 - 40%, with the majority at 20%, of the audiences were predicted to be able to make the third decision on "trial" methods.

In summary, the reviewers found the publication useful in developing interest and awareness for 70 - 90% of seven audience types. Furthermore, eighty percent of the reviewers found this type publication important or extremely important in communicating this type concept to lay people. Finally, the group was divided on the worth of the product when compared to a dollar-wise equivalent number of comprehensive searches.

The project staff was extremely pleased with all aspects of the review. A research analyst successfully completed the experiment. The package, delimited to a particular element of adoption process interplaying with several audience types, was pronounced successful by the reviews. Furthermore, the cost comparisons revealed the importance of diversified repackaging. Educational decision makers prefer the comprehensive package which the model dissemination project normally produced while other educators had a very definite need for the community school type package. Perhaps a future experiment can compare a technical report prepared by a team for several audiences with a comprehensive package for the educational policy maker. (See Part IV for a copy of The Community School Experience.)

The next section will report on the evaluation of the remaining project objectives. Suggestions for improving the dissemination process will be discussed in the section of findings and recommendations.

Liaison and Research Utilization

The project's effort in developing interstate relationships which would enable other states to become part of a research dissemination network centered on a conference held in Raleigh in September. Eight states in the southeast were represented at a one day Regional Conference on Information Retrieval and Dissemination. The participants heard speeches from ERIC Central, STRC, and private business, and the Division of Research describe ERIC, cost comparisons of computerized retrieval systems, information retrieval, and the North Carolina project. Evaluative comments on the conference varied from "the discussion could prove very beneficial: to "every presentation was highly relevant and well presented; not a moment's lag occurred ... it is not often that meetings are so productive." Three states received a trial computer search and one experimented on a pilot basis with ten additional searches. Follow-up of the meeting included a

management study requested by five of the states. (See Part IV for regional service center costs through STRC.)

Liaison and feedback relationships with ERIC Central were accomplished through standard reporting and supplemental discussions in Washington and Raleigh on state and regional efforts.

A one-day problem session was held with information, dissemination, and "change agent" specialists at the Ohio State Clearinghouse. The discussions dealt with the project's efforts and feedback from its educational practioners. This linkage provided, and continues to provide, valuable theoretical and practical information to the project and the clearinghouse.

Legislative action limited the numbers of research analysts to one rather than three. Two analysts were available for a short period, but the bulk of the services to the satellite centers was provided by one research analyst and the project manager. Thus, it was difficult to prove precisely how well the model system would have performed in its service to the satellite centers with three analysts. Logically, additional field services would have assisted each information specialist in the development of his role within the project. With the joint evidence of time restraints and problem solving within the Central LEA staff, the extent of increased utilization of the project's services could be only speculated.

Findings and Recommendations

The information retrieval system located at STRC provided a dependable, cost-effective operating system for the two ERIC files -- RIE and CIJE.

Dissemination services from the Research and Information Center were proven both credible and expeditious. The special repackaging experiment in providing interest and awareness information to several audiences was deemed successful by a panel of experts. Training of the information specialists, while technically

adequate, suffered somewhat by limited assistance provided for the information-specialists' perception of their roles.

An unexpected finding at most LEA's was the lack of a problem solving approach which included quantitative information seeking. Much research material was found either as a result of informal contact or from readily available books and magazines. There was no formal or well-structured procedure within these LEA's for identification, location, or acquisition of resource documents. In contrast to these units, the information specialist from the LEA in the top third of the "innovative" list had direct responsibility for providing staff members with the best information available.

Recommendations

Progress has been made in the development and operation of a model research dissemination system for state educational agencies. As with the majority of pilot and experimental programs, there are possibilities for improvement in service, training, and operation. The recommendations by the Division of Research are made to assist others in developing similar programs and must be implemented in this state if other improvements are to follow during the past year's effort. The Division realizes fully that changes in or expansion of the model in North Carolina can occur only to the extent that adequate resources are allocated by the people of North Carolina. Therefore, for the reader's convenience, the recommendations are organized by service area rather than by North Carolina priorities.

Information Retrieval

1. Training for research analysts in computerized and manual retrieval of information from books, pamphlets, reports, machines, and experts should be provided by the Research and Information Center. Training materials developed by the project staff on computerized retrieval should make it possible to conduct total training in the RIC.

2. An internship program should be developed with those area universities which provide library science training. The arrangement should be beneficial to both groups through the training possible in the RIC and the benefit these interns could be in providing services to local and state decision makers.
3. The excellent service provided by STRC should be continued. The RIC should develop a system which would make the user aware of the estimated cost of his computerized retrieval before he submits it to STRC. The cost system should include a fixed overhead charge for the computerized retrieval.

Dissemination

1. Training for research analysts should include more interview experience in the SEA. The RIC could provide more service to the SEA by regularly asking these policy makers if RIC could assist them with information needs. This regular communication should provide better information channels for comprehensive searches by other SEA and LEA requesters.
2. Assistance in role development for the satellite information specialists should be provided as they request it. Calls or on-site visits once a month should be of benefit in this effort. The calls might go to the information specialist or a fellow staff member and offer assistance for their information needs.
3. Small information centers in a few experimental units should be established through State assistance. The problem solving process should be improved by these centralized information gathering and resource centers.
4. Other states have found a small writing team preparing multi-audience materials of the awareness and technical type to be extremely useful. When many requests for research information on a particular topic were

received at the SEA, the "team" with "experts" prepared both publications. The State of North Carolina should work with its model system and experiment with a similar writing team located in the Research and Information Center or the Division of Public Information.

Model System

1. The Division of Research is convinced that better information must be made available to the state's schools when they need it. Having proven itself a workable dissemination model with a variety of LEA's, the State should provide $75,000 to expand the model state-wide. These funds would provide the state over one thousand comprehensive searches and training for at least one information specialist in each county. Few people will argue against the value to be realized from such a consolidated information network between SEA services and LEA needs.

PART IV

PROJECT PRODUCTS 1971

D E P A R T M E N T O F P U B L I C I N S T R U C T I O N

STATE OF NORTH CAROLINA RALEIGH

April 2, 1971

Mr. Robert C. Clary
ESEA Director
Roanoke Rapids City Schools
719 Roanoke Avenue
Roanoke Rapids, North Carolina 27870

Dear Mr. Clary:

Your recent request to the Research and Information Center for information concerning accountability and performance contracting has been referred to me for reply.

Enclosed please find the following materials:

(1) "Accountability: An Interlocking Partnership"--Research and Information Center capsule report.
(2) Three (3) journal articles concerning performance contracting.
(3) Two (2) journal articles concerning accountability.
(4) One (1) journal article concerning the testing of accountability.
(5) The information sheet "Effective Utilization of the ERIC System" for your background information.
(6) The Research and Information Center brochure for your background information.
(7) The "Documents Request Record" form. After reading the ERIC computer generated bibliography which I have enclosed, if you wish to obtain some of the listed documents, fill out and return the form.

I hope that you will find the enclosed material helpful. If I may be of further assistance in any way, please let me know.

Sincerely,

Lynn Quisenberry

(Miss) Lynn Quisenberry
Research Analyst
Research & Information Center
Raleigh, North Carolina
Telephone: 829-7904

LQ/bd
Enclosures
cc: Mrs. Gladys Ingle
Mr. Robert Evans

SAMPLE ENTRY
RIE

[illegible]
NORTH CAROLINA SCIENCE AND TECHNOLOGY RESEARCH CENTER

ED001637
[illegible]
SCHOOL FAILURE - A SUMMARY OF RESEARCH STUDIES.
STAFFORD
EDRS PRICE MF-$0.09 HC-$1.03
11P.
DI6667
GRADE REPETITION, PARTICULARLY IN THE EARLY GRADES, NOT ONLY FAILS TO HELP THE MAJORITY OF PUPILS ACADEMICALLY, BUT IN MANY CASES, CREATES ADDITIONAL PROBLEMS. FACTORS INVOLVED IN A STUDENT'S FAILURE VARY FROM SCHOOL TO SCHOOL. THE MAJOR PROBLEMS OF GRADE REPETITION ARE THAT THE STUDENT IS OLDER AND LARGER THAN HIS CLASSMATES, AND THAT HIS ABILITY, INCLUDING HIS LEARNING RATE, IS GENERALLY BELOW THE CLASS AVERAGE. SEVERAL STUDIES HAVE REVEALED DEFINITE RELATIONSHIPS BETWEEN SCHOOL RETARDATION AND DELINQUENCY. FOR YOUTH WHO HAVE ALREADY EXPERIENCED A POOR FAMILY LIFE, SCHOOL FAILURE MAY PROVOKE RESENTMENT. YET IN PARTICULAR SITUATIONS IN THE SENIOR HIGH SCHOOL AND VOCATIONAL PROGRAMS, ARBITRARY MINIMUM STANDARDS MUST BE SET FOR SOME SKILLS TO PROTECT LIFE OR TO MEET SPECIFIC CAREER DEMANDS.
BULL-566
PHILADELPHIA PUBLIC SCHOOLS, PA.

ED003257
24
61
PERSONALITY TRAITS RELATED TO "STRESS TOLERANCE" AS DETERMINANTS OF ACADEMIC ACHIEVEMENT.
KUETHE, JAMES L.
LYR39600
EDRS PRICE MF-$0.09 HC-$1.16
29P.
DI6667
THE PURPOSE OF THIS INVESTIGATION WAS TO ISOLATE PERSONALITY TRAITS THAT ARE RELATED TO ACADEMIC ACHIEVEMENT INDEPENDENT OF CORRELATIONS WITH INTELLECTUAL CAPACITY AS MEASURED BY THE SCHOLASTIC APTITUDE TEST, ACADEMIC RANK AS A HIGH SCHOOL SENIOR, AND TEACHER RECOMMENDATIONS. THIS RESEARCH CENTERED ON THE CAPACITY OF THE INDIVIDUAL COLLEGE FRESHMAN TO FUNCTION IN STRESS SITUATIONS, CONSIDERED TO BE AN IMPORTANT FACTOR IN ACADEMIC ACHIEVEMENT. THE SUBJECTS WERE 351 MALE COLLEGE FRESHMEN. THE PSYCHASTHENIA SCALE OF THE MINNESOTA MULTIPHASIC PERSONALITY INVENTORY (MMPI) AND TWO MEASURES OF THE ACQUIESCENCE RESPONSE SET WERE ADMINISTERED TO ALL SUBJECTS. IN THE OVERALL ANALYSIS GAINED AFTER THE SUBJECTS COMPLETED THEIR FRESHMAN YEAR, CERTAIN RELATIONS BETWEEN THE VARIABLES WERE FOUND TO BE QUITE CONSISTENT. THE CORRELATIONS BETWEEN PSYCHASTHENIA SCORES AND GRADE POINT AVERAGES WERE ALWAYS NEGATIVE. CORRELATIONS BETWEEN ACQUIESCENCE AND GRADE POINT AVERAGES WERE TYPICALLY NEGATIVE, AS WERE THE SIGNIFICANT CORRELATIONS BETWEEN VERBAL APTITUDE AND ACQUIESCENCE. THE ACADEMIC PERFORMANCE OF MOST OF THE SUBJECTS DURING THEIR FRESHMAN YEAR RELATED

OUTPUT

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[illegible]145
AA50[illegible]
69 JAN
GOOD SCHOLARSHIP: DO STUDENTS REALLY CARE?
PARRISH, MARY; WARDY, GILBERT [illegible].
CLEARING HOUSE; 43; 5; 275-279

EJ00[illegible]598
50 06
69 FEB
THE FIRST YEAR OF PASS-FAIL AT BRANDEIS UNIVERSITY: A REPORT
SGAN, MATHEW R.
J HIGHER EDUC; 40; 2; 135-148

EJ004975
AA502105
69 MAY
SCHOOLS AND THE STRATIFICATION PROCESS
HAUSER, ROBERT M.
THIS IS A REVISED VERSION OF A PAPER READ AT THE ANNUAL MEETING
OF THE AMERICAN SOCIOLOGICAL ASSOCIATION (63D, AUGUST
1968).
AMER J SOCIOL; 74; 6; 587-611

EJ005007
AA501698
69 APR
COMPETITION FOR GRADES AND GRADUATE-STUDENT PERFORMANCE
CLARK, D. CECIL
J EDUC RES; 62; 8; 351-354

EJ005342
AA502300
69 W
THE EFFECT OF UNIVERSITY EXPERIENCE ON OCCUPATIONAL CHOICE
AMONG UNDERGRADUATES
HIND, ROBERT R.; WIRTH, TIMOTHY E.
SOCIOL EDUC; 42; 1; 50-70

EJ005873
AA502437
69 SUM
PREDICTION OF ACADEMIC AND NONACADEMIC ACHIEVEMENT IN TWO-YEAR
COLLEGES FROM THE ACT ASSESSMENT
BAIRD, LEONARD L.
EDUC PSYCHOL MEAS; 29; 2; 421-430

EJ006118
AA502371
69 SPR

Research and Information Center
State Department of Public Instruction
Raleigh, North Carolina

March 24, 1971

ACCOUNTABILITY: AN INTERLOCKING PARTNERSHIP
A Capsule by Lynn Quisenberry

An increasing demand for accountability by performance-minded industry and governmental officials, parents and students, and the community in general confronts every educator, and he must be prepared to meet the challenge! Although seven out of ten adults feel that the schools are doing an adequate job of educating our children, two out of every three adults are in favor of greater accountability on the part of teachers and school administrators regarding the progress of the student in the public school.

"What exactly is accountability?" and "accountable for what?" ask educators who, in the face of this growing concern, are swamped with a perplexing number of educational possibilities. Accountability means a constant evaluation and interpretation of the results of education. It means sharing evaluation results with the public and constituencies which need to know. And it means that teachers and administrators are held responsible for the weaknesses as well as the strengths revealed. In other words, accountability means that a set of educational goals is promised and delivered. Evaluation of learning based on what the teacher teaches, how much time is spent on the specific topic, or how much money is involved shifts to evaluation of learning based on how much the student actually learns. Thus, the learning responsibility is moved from the student to the school. No longer can such answers as "disadvantaged background" or "lack of motivation" be accepted as feasible reasons for lack of student learning. Now the school, the teacher, and the administrator must meet

(over)

the individual student where his need exists.

The basic strategy for accountability is to construct and evaluate a workable educative plan, to employ participatory decision-making policy, and to facilitate an open educative process utilizing many professional and nonprofessional resources. In an accountability program, just as in the field of engineering, the educator must be able to specify what he is trying to accomplish. An independent audit of result will then allow taxpayers and their representatives to judge the educational payoff of the program and to decide which programs will bring the most success. Evaluations of this type determine not only the success of a program but also if the allocated funds are to be spent for the purposes intended. It also aids in comparing the resources employed on a specific activity with the dollar benefits obtained, and shows how cost effectiveness designed to measure a specific objective of several alternatives contributes to accomplish the intended objective.

This is not to say that the entire educational process will be "put on a scale and weighed." Needless to say, some areas do not lend themselves to scientific analysis, i.e. creativity or self-image. But concrete explanations of problems and programs, limitations and effectiveness of testing and learning evaluation, and other such data can be invaluable to determine the effectiveness of innovative or traditional programs.

Modern management techniques currently employed in business and industry are utilized in accountability programs. School management must reflect the utilization of the services, pilot programs, and advice of management consultants along with technical and research specialists. New alliances outside of the school must be formed with those who can help develop, manage, and verify new methods for learning. In essence, a framework for feedback must be established between the educators and the community.

Because the accountability program emphasizes teacher responsibility, teachers become accountable for relating process and procedures to results and thus to student accomplishment. Accountability does not mean to imply punishment of inneffective teaching practices. Rather, it is used to locate where children need help, to detect weakness, and to find solutions for them. Don Davies of U. S. O. E. states that accountability will "develop teacher talent, not grade it."

Because the accountability program also emphasizes administrator responsibility, the administrators must use effective tools of management to integrate such factors as finance, organization, social policy, facility and equipment use, parental involvement, and educational manpower into a workable plan to give the teacher assistance.

Providing this increased educational accountability to the public will require new techniques, attitudes and a willingness to innovate. But no matter how the accountability program is achieved its goal remains the educational competence of a trained, young citizenry.

Finally, "who is accountable?" Everyone is! In a pattern of interlocking partnership the total community, guided by the school administration, helps to provide the kind of education that produces rational, responsible, and effective citizens who are able to cope and achieve in today's world.

For further information:

Briner, Conrad. "Administrators and Accountability," THEORY INTO PRACTICE 9:203-206, October 1969.
The concept, basic strategies, and possibilities of accountability, today's "in" term in education, are reviewed.

Darland, D. D. "The Profession's Quest for Responsibility and Accountability," PHI DELTA KAPPAN 52:41-44, September 1970.
The effects of accountability on the teaching profession are explained. Restrictions and explanations of the nature and extent of the new program in education are included.

(over)

Elam, Stanley. "The Age of Accountability Dawns in Texarkana," PHI DELTA KAPPAN 51:509-514, June 1970.
A summary of the Texarkana, Arkansas educational experiment is given. Special features of the experiment, achievement levels of specific programs, and strengths and weaknesses of accountability are included.

Lessinger, Leon M. "Accountability For Results: A Basic Challenge For America's Schools," AMERICAN EDUCATION 5:2-4, June-July 1969.
An analysis of the meaning of accountability for education today is discussed along with steps to implement an accountability program. The urgent need for accountability is also stated.

_____. "Accountability in Education," EDUCATIONAL TECHNOLOGY 11:Entire Issue, January 1971.
Articles concerning all facets of the accountability movement are discussed. Included are: performance contracts, accountability assessment, and special experimental programs.

_____. EVERY KID A WINNER: ACCOUNTABILITY IN EDUCATION. New York: Simon and Schuster, 1970.
This book discusses: (1) educational engineering, (2) the development of capital for the schools, (3) management systems and the technology of instruction, (4) the independent audit, (5) a review of the Texarkana accountability program, (6) the movement for accountability, and (7) the implications of this new movement. An exhibit section is also included.

Nottingham, Marvin A. and Zeyen, Louis D. "Commitment to Accountability--A Case Study," JOURNAL OF SECONDARY EDUCATION 45:3-8, January 1971.
A model plan for implementing an accountability program is reviewed in a step by step analysis. Diagrams of the model are given.

Stocker, Joseph. "Accountability and the Classroom Teacher," TODAYS EDUCATION 60:41-56, March 1971.
A brief analysis of the potential and the controversy surrounding accountability is discussed. A summation of the 1970 national study on accountability by the National Education Association is presented with a summation of the NEA conference itself.

Pages 61-77 have been removed because of the impossibility of securing reproduction rights to these materials which were copyrighted. They consisted of:

Brattan, Dale And Others, "Performance Contracting: How It Works in Texarkana," School Management, August 1970, pp.8-10.

---------- "What Type of Performance Contract Is Best For You?" Education Summary, p.3.

---------- "Performance Contracting Flourishes in Dallas," Report on Education Research, March 31, 1971, pp. 5-7.

Lessinger, Leon M., "After Texarkana, What?" Nation's Schools, v84, n6, December 1969, pp.37-40.

Wik, Harold, "Accountability for Results; A Basic Challenge for America's Schools," June 20, 1969.

Tyler, Ralph W., "Testing for Accountability. Why Criterion-Referenced Tests Are Necessary," The Education Digest, March 1971.

EFFECTIVE UTILIZATION OF THE ERIC SYSTEM

WHAT IS ERIC?

The ERIC (Educational Resources Information Center) program is the brainchild of the United States Office of Education. Its purpose is to make the total educational community aware of what is taking place in education throughout the nation and to provide expedient access to reports, curriculums, and programs. ERIC uses microfiche, a 4" x 6" flat film microform, which can be quickly programmed and sequenced for individualized and specialized materials. ERIC's objectives are:

- To save space to house significant research collections.
- To save time in locating information.
- To save money in the cost of dissemination of information.

Composed of ERIC Central and twenty Clearinghouses, ERIC is the first nationwide comprehensive information system serving American education. All components of ERIC have one thing in common: they exist to bring you the educational information which you need.

RESEARCH IN EDUCATION

Research In Education (RIE), a computer prepared report on educational research and resources, is one of the tools necessary to use the ERIC system. A journal which announces new documents added to ERIC, RIE's monthly, semi-annual, and annual indexes are available from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402 for an annual subscription of $21.00. RIE combines the work of ERIC Central and the Clearinghouses into a journal featuring abstracts and indexes to abstracts. Information may be found by author, subject, and institution.

CURRENT INDEX TO JOURNALS IN EDUCATION

Current Index To Journals In Education (CIJE), the computer generated companion to RIE, contains a main entry section, author index, subject index, and index to source journals. Begun in April 1969, CIJE now lists approximately 500 journals along with indexing additional periodicals in related and peripheral fields of education. A monthly, semi-annual, and annual index subscription is available from CCM Information Corporation, 909 Third Avenue, New York, N. Y., 10022 for a fee of $34.00.

THESAURUS OF ERIC DESCRIPTORS

The Thesaurus of ERIC Descriptors, a standard vocabulary developed by subject experts in various disciplines of education, is used for searching subject indexes of RIE and other ERIC publications for retrieval purposes. The Thesaurus, which serves as an authority list and aid to bring the language of the documents and the language of the search request together, is available from the CCM Corporation for $8.50.

PORTABLE READERS

PMK/50, a lightweight 7 1/2 pound portable microfiche reader, is manufactured by DASA Corporation. PMK/50 has an 8 1/2" x 11" viewing screen and can be plugged into a regular electrical outlet (115V, AC). The focus is controlled by a single fingertip dial and the screen illumination by one on/off button. Distributed by 3M Company, the reader is available for $89.50.

Washington Scientific Industries, Inc. also manufactures a portable microfiche reader with a 9" x 12" viewer screen. Equipped with its own carrying case, the WSI sells for $199.00.

Another reader, the Mascot Microfiche Reader produced by Bell & Howell, sells for $190.00. Weighing 16 pounds, the Mascot has a tinted 11" x 11" screen for easy viewing and a sturdy carrying case.

SERVICES OFFERED BY THE RESEARCH & INFORMATION CENTER

The Research & Information Center (RIC) offers two unique services to educational practitioners: (1) computer generated bibliographies on educational topics and (2) reproduction of ERIC microfiche documents. In order to obtain a computer bibliography of ERIC documents or CIJE journal abstracts, the user should prepare a definitive statement of the problem and a list of key descriptors by using the ERIC Thesaurus. However, if the Thesaurus is not available, the user should provide his own list of relevant terms.

Microfiche reproductions of ERIC documents can be obtained from the RIC for the nominal charge of 10¢ per card. Requests for reproductions must specify the ED number of the document, as well as the number of copies desired.

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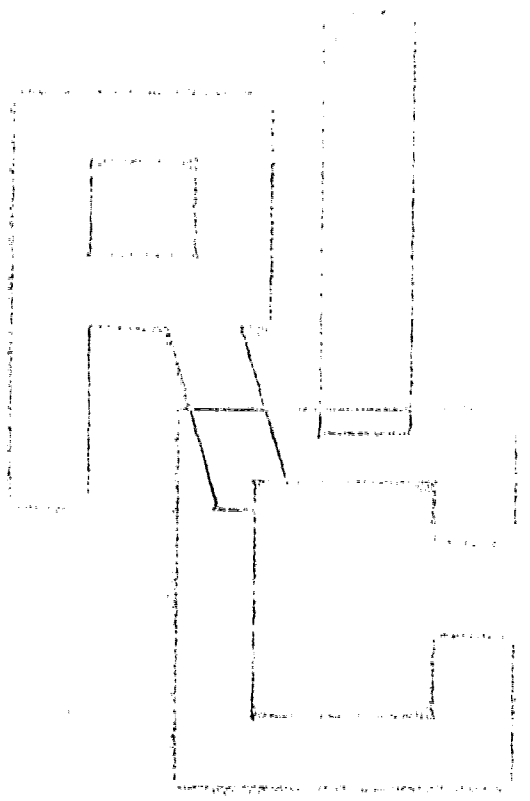
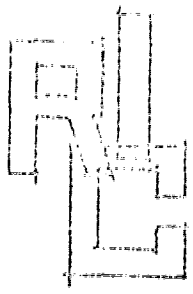
FOR FURTHER INFORMATION CONTACT:

Mrs. Gladys Ingle, Director
Research & Information Center
Raleigh, North Carolina
Telephone: (919) 829-7904
North Carolina State Department of Public Instruction





Are you [illegible]

Looking for new ideas?

Searching for research results?

Planning a new curriculum?

Interested in exemplary programs?

And are you [illegible]

Having difficulty finding information?

Unable to sort the significant out of the trivia?

Unable to read reports once you learn of them?

Then the Research and [illegible] Information Center [illegible] can be your solution! [illegible]

If you need information and need it now, the Research and Information Center (RIC), with the largest and most comprehensive store of educational information in North Carolina, has at its fingertips the resources to solve your information problems and to solve them quickly. To keep pace with the ever-changing and expanding volume of information affecting education, the RIC and its comprehensive resources, including the unique document bank—ERIC—are at your service.

What is ERIC? [illegible]

ERIC (Educational Resources Information Center) is the brainchild of the United States Office of Education. ERIC uses microfiche, a 4" x 6" flat film microform, which can be quickly programmed and sequenced for individualized and specialized materials.

RIC's objectives are [illegible]

To save space in housing significant research collections.

To save time in locating information.

To save money in the cost of disseminating information

Scope of RIC [illegible]

The Research and Information Center's purpose is twofold. First, to make the total education community aware of what is taking place in education nationwide. Second, to simplify retrieval techniques, enabling educators and others to obtain a report, curriculum information, or other research in minimum time. A highly specialized information base is maintained, which includes the entire ERIC system, ERIC Clearinghouse, products, computer generated bibliographies, an extensive collection of abstracts, indexing services, professional books and journals, news and research services, annotated bibliographies, extensive holdings of pamphlets and government documents, and the North Carolina State Department of Public Instruction historical collection. The Reading Resources Network Center, a reading information center, is an adjunct of RIC.

Unique services [illegible]

The Research and Information Center offers you three unique services related to the ERIC system:

- Computer retrieval of all titles and ERIC documents numbers on specific subjects with or without abstracts.
- Reproduction of the microfiche cards containing the full text of the document.
- Computer retrieval of all CIJE titles and accession numbers on a specific subject with or without abstracts. CIJE is the *Current Index to Journals in Education*, a computerized index to over 500 journals.

The Research and Information Center also has the capability of reproducing or copying many other resources for dissemination to the user without a request for return of the materials. For a nominal fee, your information needs can be quickly and effectively met.

[illegible]

[illegible] 1971

[illegible] 0219 [illegible]

[illegible] Bibliography

[illegible]

Mr. Robert C. [illegible]

ESEA Director, Roanoke Rapids City Schools

719 Roanoke Avenue, Roanoke Rapids, N. C.

FOR PROJECT USE ONLY

PLEASE SEND ME THE FOLLOWING:

ABSTRACTS		MICROFICHE		DOCUMENTS	
[illegible]ssion Number	Date Sent	Accession Number	Date Sent	Accession Number or Title	Date Sent

Send all abstracts · Send all microfiche

Return to: (Research Analyst's Name), Research & Information Center, State Department of Public Instruction, Raleigh, North Carolina 27602

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RESEARCH & INFORMATION CENTER: AN OVERVIEW

Prepared by the *RIC* Staff
April, 1971

Research & Information Center
N. C. State Department of Public Instruction
Raleigh, North Carolina 27602

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RESEARCH & INFORMATION CENTER: AN OVERVIEW

"People come first" is the motto of the Research & Information Center *(RIC)*, and people--both those who use the Center and those who staff it--have made the *RIC* a big success. Created in 1960 with State funds as a supportive arm of the *SEA* and serving only *SEA* staff, the *RIC's* activities have expanded, with the aid of Federal funding, to incorporate the information needs of the entire State as well as those of numerous out-of-State users. The *RIC* operates as an independent component under the Assistant Superintendent for Planning, Research, and Development. By maintaining a comprehensive store of research and other educational information for dissemination, the *RIC* assists educators in keeping abreast of new developments in education as well as providing them with brief or in-depth information as required on almost any educational topic.

Facilities include areas for reading, studying, browsing, reference work, research, *ERIC* documents and hardware, processing and the Reading Resources Network Center. Housed in a complex of six large rooms, the *RIC* operates on the cluster concept, *i. e.*, each area is used for a specific purpose. One room houses reference materials; special collections and processing are located in another; the *ERIC* collection and other microforms are stored in another. Current periodicals and information files are maintained in a room which is also used as a reading and study area. The Reading Resources Network Center, a satellite of the *ERIC/CRIER* Clearinghouse, has been allocated one large room with a full-time professional staff member. The sixth room serves as the Director's office. Total personnel of the Center now includes seven full-time staff members. Coordination and supervision of the Center's activities are guided by the Director who serves in an administrative and consultative role. The Library Assistant conducts the library operations

of the Center. All *ERIC* requests as well as any other type of information request that is generated by *LEA* or *SEA* personnel is handled by the Director and the three retrieval specialists. A secretary and clerk complete the staff.

The Research & Information Center places a comprehensive store of research information and resources at the disposal of the user. Collections maintained include the following:

- 5,000 professional books - Books may be checked out for a three-week period and may be renewed. No overdue fines are charged.
- 300 current periodicals - Back issues to 1960 are maintained on microfilm (3/4 of these are indexed in *CIJE)*
- Basic education indexes and abstracts
- Standard references
- Relevant pamphlets and government publications
- Subscriptions to national and State newspapers
- Special files on North Carolina public schools
- Subscriptions to many research services and educational associations
- Collections of annotated bibliographies for distribution - These are generated upon request or by staff anticipation of user needs
- Selected dissertations on microfilm
- Cooperative research projects on microfilm
- North Carolina historical collection - Publications of the State Department of Public Instruction dating back to 1850
- Vertical information files on almost any educational topic - These files include pamphlets, bibliographies, relevant articles, research studies, and other materials from many different sources, including memberships in numerous educational associations

- Collection of all North Carolina basal textbooks for both the elementary and secondary levels
- The *RIC* is the depository for all *PREP* dissemination. *PREP* materials are disseminated on microfiche
- Special collection of the North Carolina Attorney General's rulings on education dating back to 1942
- Files on *ERIC* clearinghouse activities
- Complete *ERIC* collection and all *ERIC* products
- Special equipment: 1 copying machine, 1 microfiche reproduction machine, 2 microfilm-microfiche reader-printers, 1 microfiche reader-printer, and 1 microfiche reader (on loan to another building), and 1 *DASA* portable microfiche reader

The *RIC's* holdings and facilities are utilized by over 500 educators monthly. For example, in February and March 1971, total requests numbered 713 and 756 respectively. Of this number, 181 were specifically using the Center's *ERIC* program in February and 184 in March. Users of the Center's resources can be broken down into five large groups: *SEA* personnel, *LEA* personnel, college and university faculties and students, other State agencies, and out-of-State agencies. Users request information by telephone, letter, and on-site visitation of the Center. The *RIC* prides itself on the fact that all requests are received pleasantly and expedited quickly.

As an integral part of the State Education Agency, the Research & Information Center provides a wide variety of services:

- Leadership activities enabling *SEA* personnel and others to become aware of all materials in the extensive collections now available and to use these materials to greatest advantage within the Center itself.
- Leadership activities, varied in terms of user needs, in the broad area of education information dissemination. These activities include those requested and those initiated by the staff in anticipation of user needs.
- Leadership activities to keep personnel in the *SEA* and other educators continually aware of specific educational activities, completed and in progress, throughout the State and the nation. These activities place considerable emphasis on promising innovative practices.

- Execution of policies and processes which result in a centralized ordering and processing system; and a centralized storage, retrieval, and dissemination system for comprehensive materials collections

- Evaluation of all incoming pamphlets, brochures, position papers, government publications, inter-state publications, and the like

Techniques employed in rendering these services may be listed as follows:

- Circulates books and materials

- Provides current awareness services to the *SEA* and others so that they may become aware of the large volume of information available and utilize it more effectively

- Provides ready reference services

- Prepares annotated bibliographies on request and in anticipation of user needs

- Prepares information packets for dissemination for use in conferences, workshops, in-service programs and the like

- Promotes promising innovative educational practices throughout the State and nation, both completed and in progress, by making *SEA* personnel and others aware of them

- Provides cooperative agreements with regional libraries and centers for supplementing the resources of the *RIC*

- Handles all North Carolina Association of Educators' requests for educational information

- Provides both computer and manual retrieval of information in the *ERIC* and *CIJE* system

- Serves in a consultative capacity to *SEA* and *LEA*

To the extent possible, information packages are tailored to meet the needs of the requestor. Any or all of the following repackaging techniques might be employed in supplying information to the user:

- Literature searches of books, pamphlets, periodicals and the like

- Computer or manual searches of the *ERIC* system

- Basic unannotated bibliographies

- Annotated bibliographies

- Reprints of relevant documents or articles
- Reproduction of *ERIC* microfiche
- Written reviews
- Capsule reports on educational topics
- Summaries and precis of selected documents
- Information dissemination by telephone, letter, or in person

Current awareness services include the preparation of several publications which are disseminated throughout the educational community. At present, the Center's mailing list number 375 and is by request only.

- *EMPHASIS*, a weekly subject listing of current magazine articles and pamphlets too new to be listed in the standard indexes
- *ERIC INSTANT RESEARCH*, a regular annotated subject bibliography covering *ERIC* documents pertaining to topics of current interest
- *RECENT ACQUISITIONS*, an irregular publication listing new and/or noteworthy books acquired by the Center
- *EDUCATOR'S BOOKSHELF*, a regular publication consisting of annotated subject bibliographies issued as a result of *ERIC* computer searches and comprehensive reviews of the available literature
- *INFORMATION KITS*, containing comprehensive information about the State, the *SEA*, the *ERIC* program, the Research & Information Center, and other useful information for new staff members.
- *See Appendix for a comprehensive list of current products disseminated by the Center*

The Center staff is also available to the teacher education institutions and *LEAs* for preservice and inservice training in the use of educational resources.

The advent of *ESEA* opened new vistas and Title V funds were made available to implement the *ERIC* program on a limited basis, to purchase needed equipment, and to secure additional personnel. The *ERIC* program is an integral part of the Center's operation. Until 1969, all retrieval of the *ERIC* system was performed manually. In October of that year, the

RIC gained computer capabilities through a cooperative arrangement with the Science Technology Research Center *(STRC)*. Seventy-five computer searches were generated by the *RIC* from October 1969 to September 1970. With the inception of the Model Information Dissemination System project *(MIDS)* and the predicted expansion of computer services, new personnel was added to the *RIC* staff to handle requests. From September 1970 to March 1971, 74 computer searches have been processed--29 by the *MIDS* project and 45 by the *RIC*. The *MIDS* project has been influential in working for a more sophisticated search output. Before the project began, computer output contained only *ED* numbers and titles. Presently, complete abstracts of *ERIC* documents are received. The computer now has the capability to search the *Current Index to Journals in Education (CIJE)* file also, which it could not do a year and a half ago. In spite of computer capabilities, searching of the *ERIC* system is still performed manually for current awareness, reference, and brief information requests.

The work of the *RIC* staff on an *ERIC* request does not stop upon receiving the computer output. The output is evaluated for relevance and outstanding reports are copied or the microfiche reproduced to be sent to the user. The *RIC*, realizing that *ERIC* is only one of many research tools, always combs the other resources available in the Center to supplement the search output. Information is then incorporated into an information package to be sent to the user. A typical package might contain the following: computer output, microfiche reproductions, copies of relevant articles, and bibliographies. When possible, a list of resource persons who may be contaced for further information on the topic is appended.

In addition to increasing the volume of *ERIC* requests and providing

an additional staff member, the *MIDS* project has furnished the Center with a microfiche reproduction machine. Reproductions of *ERIC* microfiche are usually a part of the total information package sent to the user. However, a large number of reproductions have been disseminated to out-of-State users such as the South Carolina Department of Education and the Tennessee *RCU*. In the months of February and March 1971, 339 *ERIC* documents were reproduced and disseminated by the Center. Three microfiche reader-printers are available for use in the Center. Very popular with *SEA* personnel is the portable *DASA* microfiche reader which was supplied by the *MIDS* project. The *DASA* reader is loaned out to staff members overnight so that those who do not have the opportunity to utilize the Center's *ERIC* facilities during the working day may do so at their leisure and in the comfort of their own home or office.

It should be noted that those requesting use of the *RIC's* computer services are not the only people who are using the Center's *ERIC* program. The Center also has many on-site visitors. Some come only to read one *ERIC* document, some come to research a topic thoroughly, some browse through the indices to see what has been put into the system on their topic, and some come to follow-up on their computer output. In February and March, approximately 365 people were served by the Center's *ERIC* program. The Center remains open 24 hours a day for the convenience of the *SEA* personnel so that research may be carried on after normal working hours.

Little formal publicity has been given to the *RIC*. Gradually, however, news of its holdings and services has spread throughout the State, and more and more educators are requesting use of its services. Users of the Center have been its best advertisement to date. Future plans for the Center are concentrated on expanding current awareness services. The following is a

list of projected activities already in the planning stage:

- Preparation of a canned slide-tape presentation on the *ERIC* program which can be utilized by local educational agencies and teacher education institutions. This presentation, now in the initial stages, will be ready for distribution in the near future and if experiments with it prove successful, five duplicates will be made for circulation to *LEAs*

- Preparation of a colorful succinct brochure, *Introducing the RIC*

- A continuing awareness program for informing school library supervisors, media specialists, superintendents, and deans of schools of education in an effort to acquaint them with the services rendered by the Center, particularly the *ERIC* program

- Preparation of a feature article *(on the Center and ERIC program)* to appear in the *North Carolina Public School Bulletin*

- Preparation of a review of *ERIC* and other sources on differentiated staffing and other priority topics for general distribution

- More emphasis on Center staff visiting *LEAs* and teacher education institutions to involve them in the use of *RIC* resources

Through the years, the value of the services and resources of the Research and Information Center has been realized; resulting in increased funding, personnel, and space. Comments by visitors and users in both in-State and out-of-State indicate that the Research and Information Center is likely one of the most advanced and comprehensive among State agencies.

RIC Staff: Mrs. Gladys G. Ingle, Director
Mrs. Susan G. Wellborn, Assistant Director
Miss Lynn Quisenberry, Retrieval Specialist
Mrs. Barbara Crevar, Retrieval Specialist
Mrs. Signa Evans, Library Assistant
Miss Brenda Davis, Secretary
Miss Ruby Jones, Clerk

Appendix B

To: Dr. H. T. Conner
From: Mrs. Gladys Ingle

N. C. State Department
of Public Instruction

Research & Information Center Monthly Report
February 1-March 1, 1971

Total Requests: 713

ERIC Requests: 181

Non-ERIC Requests: 532

I. Computer Searches Completed - 17

1. Paraprofessionals in Reading Programs
2. Competitive Funding
3. Dissemination of Educational Information
4. Laboratory Training for Vocational Education Directors
5. Cooperative Programs
6. Grading and Motivation
7. Innovative Instructional Technology Programs
8. Evaluation of Occupational Education Programs
9. Curriculum Theory in Home Economics Education
10. Reading Research
11. Nonverbal Communications
12. Role Theory, Conflict, and Perception of Vocational Directors and Administrative Personnel
13. Occupational Home Economics
14. Effect of Group Guidance on Vocational Choice of Emotionally Disturbed
15. Organization of Summer Institutes or Workshops
16. Science Instruction in Two-Year Colleges
17. Innovative Elementary Teacher Education Programs

II. Bibliographies Completed and Ongoing - 7

1. Independent Study
2. Inquiry Method
3. Community School
4. Supplement to Middle School Bibliography
5. Instant ERIC Research
6. Environmental Education (ongoing)
7. Differentiated Staffing (ongoing)

III. Special Projects Completed and Ongoing

1. Community School Booklet (ongoing)
2. Educational Definitions for Vocational Education
3. College Enrollment and Admissions Policies
4. Educational Leadership
5. Community School: A Capsule Report
6. Effective Utilization of the ERIC System (handout)
7. Computer Searches Completed and On File (handout)

8. Slide/Tape presentation of ERIC and RIC (ongoing)
9. RIC and ERIC Brochure (ongoing)
10. Comparative Study Analysis of RIE (ongoing)
11. Packages of Materials Disseminated by Request:
    1. Year-Round Schools
    2. Open Door Community Colleges
    3. Portland, Oregon Community School
    4. Drama Clubs
    5. Upward Bound
    6. Accountability
    7. Humanizing the High School
    8. Computer Assisted Instruction
    9. Integration in the Secondary Schools
    10. Nongraded System
    11. Word Lists
    12. Middle Schools
    13. Criterion-referenced Testing
    14. Testing
    15. Funding for Federal and State Programs
    16. Environmental Education
    17. Performance Contracting
    18. Day Care Centers
    19. Student Involvement in Decision Making
    20. Teacher Evaluation
    21. Corporal Punishment in the Public Schools
    22. Differentiated Staffing
    23. Student Suspension and Expulsion
    24. Biology and Chemistry Curriculum
    25. Project Head Start
    26. History of Education 1870-1914
    27. Mathematics Curriculum, Grades 10-12
    28. Semantic Differential
    29. Reading Programs for Slow Learners
    30. Summer Institutes
    31. Nine Month School Fund
    32. Television in Education
    33. High Interest, Low Vocabulary Books

IV. Non-ERIC Requests (informally totaled) - 532, e.g., selected materials on differentiated staffing, interlibrary loans, ready reference, and distribution by request of non-ERIC products.

ERIC User Report

		Total
Local Education Agency:		
	Superintendent	7
	Assistant Superintendent	9
	Principals	3
	Supervisors	22
	Teachers	3
	Students	2
State Education Agency:		
	Superintendent	2
	Assistant Superintendent	11
	Division Directors	14
	Consultants	60
	Others	5
Researchers:		5
College and Universities:		
	Students	13
	Professors	8
Other State Agencies:		10
Out-Of-State:		7
Other:		0
	TOTAL	181

Number of Prints Made - 458

Clients	445
RIC Staff	13

Microfiche Reproductions Made

Cards	275
Documents	164

Computer Searches - 17

RIC	14
Project	3

Microfiche Used

Titles	309

To: Dr. H. T. Conner
From: Mrs. Gladys Ingle

N. C. State Department
of Public Instruction

Research & Information Center Monthly Report
March 1-April 1, 1971

Total Requests: 756

ERIC Requests: 184

Non-ERIC Requests: 572

I. Computer Searches Completed - 25

1. Effects of Counseling on Adjustment of Elementary Pupils
2. Science Courses in High School
3. Inservice Education Instruction in Utilization of Media and Technology
4. Instruments to Measure Leadership
5. Occupational Cluster Concept, Grades 9-12
6. Evaluation of Teacher Abilities
7. Recent Research in Reading
8. Recent Research in Language Arts
9. Team Training in Non-graded Schools
10. Curriculum Reforms in Physical Education
11. Reading for the Mentally Retarded
12. Vocational Education
13. Studies in Oral Language Development (Elementary)
14. Test Construction for Environmental Education
15. Creative Dramatics
16. Verbal Development
17. Training of Volunteers in the Library
18. Job Classification for Library Aides
19. Teaching of Biological, Physical, and Natural Sciences
20. Statistical Studies of Team Teaching, Individualized Instruction, and the Non-graded System
21. Library Technicians
22. Grouping for Instructional Purposes
23. Heterogeneous Grouping
24. Values of the Teaching of English
25. Transition Grades

II. Bibliographies Completed and Ongoing - 7

1. Differentiated Staffing (ongoing)
2. Accountability
3. Criterion-referenced Testing
4. Geoboards
5. Slow Learners (update)
6. Teaching Reading to the Culturally Disadvantaged
7. Environmental Education

III. Special Projects Completed and Ongoing

1. Slide/Tape presentation of ERIC and RIC (ongoing)
2. Brochure on RIC
3. Introduction session for Model Dissemination Center Participants
4. Community School Publication (ongoing)
5. Center visits, preparations, and written reports
6. Comparative Study Analysis of RIE
7. Feasibility Studies on Teacher Education
8. Capsule of Accountability
9. Packages of Materials Disseminated by Request:
    1. Educational Secretaries
    2. Year-Round Schools and Extended School Year
    3. Dropouts
    4. Student Involvement
    5. Classroom Management
    6. Mathematics for the Slow Learner
    7. Accreditation
    8. Dr. Charles E. Drew (for Governor Scott)
    9. Team Teaching
    10. Environmental Education
    11. Technology in Teaching
    12. Teacher Supply and Demand
    13. Teaching Reading to the Culturally Disadvantaged
    14. Teacher Aides
    15. Cluster Concept
    16. Team Teaching
    17. Paperback Books
    18. Unethical Marketing Practices of Instructional Media
    19. Training of Library Aides
    20. Job Classification of Library Aides
    21. Heterogeneous Grouping Saturation Level
    22. Transitional Grades
    23. Instructional Centers
    24. Criterion-Referenced Testing
    25. Mini-course Organizations and Curriculum
    26. Inservice Technology
    27. Reading
    28. Language Arts
    29. Physical Education for Mentally Retarded
    30. Reading for Mentally Retarded
    31. Differentiated Diploma
    32. Testing for Environmental Education

IV. Non-ERIC Requests (informally totaled) - 572, e.g., selected materials on differentiated staffing, interlibrary loans, ready reference, and distribution by request of non-ERIC products.

ERIC User Report

	Total
Local Education Agency:	
Superintendent	7
Assistant Superintendent	5
Principals	2
Supervisors	21
Teachers	9
Students	5
State Education Agency:	
Superintendent	5
Assistant Superintendent	3
Division Directors	4
Others	21
Consultants	38
Researchers:	8
College and Universities:	
Students	9
Professors	19
Other State Agencies:	20
Out-Of-State:	9
Other:	8
TOTAL	184

Number of Prints Made - 403

Clients	360
RIC Staff	43

Microfiche Reproductions Made

Cards	292
Documents	175

Computer Searches - 25

RIC	17
ERIC	8

Microfiche Used

Titles	584

Appendix C

CURRENT RESEARCH & INFORMATION CENTER PRODUCTS

Single copies are available free of charge from the Center

Research & Information Center, N. C. State Department of Public Instruction, Raleigh, North Carolina

TITLE	TYPE	DATE
Auxiliary Personnel in Education	Annotated Bibliography	3/70
Career Development	Annotated Bibliography	3/69
The Community School	Annotated Bibliography	2/71
The Community School	A Capsule Report	2/71
Computer Searches Completed and on File	Information Sheet	2/71
Data Processing in Education	Unannotated Bibliography	2/69
Differentiated Staffing	Unannotated Bibliography	6/70
Education for Survival	A Capsule Report	11/70
Education in the Future	A Capsule Report	11/70
Effective Utilization of the ERIC System	Information Sheet	2/71
Emphasis	Weekly Product	----
Environmental Education	Annotated Bibliography	3/71
Flexible Scheduling	Unannotated Bibliography	6/70
High School Student Unrest	Annotated Bibliography	7/69
Independent Study	Annotated Bibliography	2/71
Individualized Instruction in the Elementary School, K-8	Annotated Bibliography (Literature only)	9/70

(OVER)

TITLE	TYPE	DATE
Individualized Instruction in the Elementary School, K-8	Annotated Bibliography (ERIC & Literature)	12/70
Inservice Education	Annotated Bibliography	6/69
Instant ERIC Research	Weekly Product	----
Keys to ERIC: The Clearinghouses!	Information Sheet	9/70
Kindergarten Evaluation	Annotated Bibliography	2/70
Locations of ERIC Microfiche Collections in N. C.	Information Sheet	10/70
The Middle School	Annotated Bibliography	6/70
The Middle School--Supplement to June 8, 1970 Bibliography	Annotated Bibliography	2/71
The Nongraded System	Annotated Bibliography	5/70
Occupational Education in the Middle Grades	Annotated Bibliography	12/69
People as Educational Resources	Annotated Bibliography	12/69
PREP--From Research to You	Information Sheet	3/71
Research and Information Center	Information Sheet	1970
Role of the School Board and Administrators in School-Community Relations	Annotated Bibliography	4/70
Selected Readings for the Elementary School Principal	Unannotated Bibliography	2/68
Selections for the Reading Teacher in the Elementary School	Unannotated Bibliography	2/68
Student Unrest	Annotated Bibliography	12/70
Titles to Broaden Individual Horizons	Unannotated Bibliography	9/70
Team Teaching	Unannotated Bibliography	6/69

Apperdix D

ERIC INSTANT RESEARCH

EFFECTIVE UTILIZATION OF THE ERIC SYSTEM

WHAT IS ERIC?

The ERIC (Educational Resources Information Center) program is the brainchild of the United States Office of Education. Its purpose is to make the total educational community aware of what is taking place in education throughout the nation and to provide expedient access to reports, curriculums, and programs. ERIC uses microfiche, a 4" x 6" flat film microform, which can be quickly programmed and sequenced for individualized and specialized materials. ERIC's objectives are:

- To save space to house significant research collections.
- To save time in locating information.
- To save money in the cost of dissemination of information.

Composed of ERIC Central and twenty Clearinghouses, ERIC is the first nationwide comprehensive information system serving American education. All components of ERIC have one thing in common: they exist to bring you the educational information which you need.

RESEARCH IN EDUCATION

Research In Education (RIE), a computer prepared report on educational research and resources, is one of the tools necessary to use the ERIC system. A journal which announces new documents added to ERIC, RIE's monthly, semi-annual, and annual indexes are available from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402 for an annual subscription of $21.00. RIE combines the work of ERIC Central and the Clearinghouses into a journal featuring abstracts and indexes to abstracts. Information may be found by author, subject, and institution.

CURRENT INDEX TO JOURNALS IN EDUCATION

Current Index To Journals In Education (CIJE), the computer generated companion to RIE, contains a main entry section, author index, subject index, and index to source journals. Begun in April 1969, CIJE now lists approximately 500 journals along with indexing additional periodicals in related and peripheral fields of education. A monthly, semi-annual, and annual index subscription is available from CCM Information Corporation, 909 Third Avenue, New York, N. Y., 10022 for a fee of $34.00.

THESAURUS OF ERIC DESCRIPTORS

The Thesaurus of ERIC Descriptors, a standard vocabulary developed by subject experts in various disciplines of education, is used for searching subject indexes of RIE and other ERIC publications for retrieval purposes. The Thesaurus, which serves as an authority list and aid to bring the language of the documents and the language of the search request together, is available from the CCM Corporation for $8.50.

PORTABLE READERS

PMR/50, a lightweight 7 1/2 pound portable microfiche reader, is manufactured by DASA Corporation. PMR/50 has an 8 1/2" x 11" viewing screen and can be plugged into a regular electrical outlet (115V, AC). The focus is controlled by a single fingertip dial and the screen illumination by one on/off button. Distributed by 3M Company, the reader is available for $89.50.

Washington Scientific Industries, Inc. also manufactures a portable microfiche reader with a 9" x 12" viewer screen. Equipped with its own carrying case, the WSI sells for $199.00.

Another reader, the Mascot Microfiche Reader produced by Bell & Howell, sells for $190.00. Weighing 16 pounds, the Mascot has a tinted 11" x 11" screen for easy viewing and a sturdy carrying case.

SERVICES OFFERED BY THE RESEARCH & INFORMATION CENTER

The Research & Information Center (RIC) offers two unique services to educational practitioners: (1) computer generated bibliographies on educational topics and (2) reproduction of ERIC microfiche documents. In order to obtain a computer bibliography of ERIC documents or CIJE journal abstracts, the user should prepare a definitive statement of the problem and a list of key descriptors by using the ERIC Thesaurus. However, if the Thesaurus is not available, the user should provide his own list of relevant terms.

Microfiche reproductions of ERIC documents can be obtained from the RIC for the nominal charge of 10¢ per card. Requests for reproductions must specify the ED number of the document, as well as the number of copies desired.

CALL ON THE RIC — YOUR ONE-STOP INFORMATION CENTER!!

FOR FURTHER INFORMATION CONTACT:

Mrs. Gladys Ingle, Director
Research & Information Center
Raleigh, North Carolina
Telephone: (919) 829-7904
North Carolina State Department of Public Instruction

Appendix E

Excerpt from: A Program to Provide for Increased Communication Among Educational Information Centers. Final Report by C. Neil Sherman et. al. (Falls Church, Virginia: System Development Corporation), 1970.

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RESEARCH AND INFORMATION CENTER
NORTH CAROLINA STATE DEPARTMENT OF PUBLIC INSTRUCTION

Room 252, Education Building
Raleigh, North Carolina 27602

Affiliation: Division of Planning, Research, and Development, North Carolina State Department of Public Instruction

Director: Mrs. Gladys G. Ingle

History and Scope

The Research and Information Center was created in 1960. Its purpose is to maintain a comprehensive store of research and other educational information for dissemination to State Department personnel, as well as to other school personnel and educators throughout the State. Special emphasis is given to providing information to personnel who are in the process of planning new programs; to collecting and disseminating information about experimental programs within the State and elsewhere; and to assisting personnel at the local school level in establishing and using information centers. Ninety-five per cent of the Center's budget comes from the State; the remainder is Title V, ESEA funding.

Staff

The current Center staff numbers four: the Director, with background and experience in education, library science, and administration; a research information specialist; a library assistant; and a part-time clerk. The Director has been with the Center since it began.

Facility and Special Equipment

The center has five rooms occupying 1,200 square feet of space. One room houses the ERIC products and all microform materials and another, the reference collection; one contains the North Carolina Historical collection and is also used for processing; journals and files are placed in the reading and study room; and one is the Director's office.

Equipment that is available for use at the Center includes one 3-M 400 reader-printer with microfilm and microfiche attachments; one 3-M Executive I reader-printer; one DuKane reader; one 3-M 209 photocopying machine; and IBM Executive dictation equipment. The Center has access to an NB printing and processing microfiche reproducer. Costs for operating the equipment are 10¢ per sheet for the reader-printer, 5¢ per sheet for the microfiche reproducing machine, and 5¢ per page for photocopying.

Information Resources

In addition to the complete ERIC microfiche collection, the Center's holdings include back microfilm and current issues of 275 journals, selected doctoral dissertations on microfilm and microfiche, basic education indexes, abstracts, and standard references, over 3,000 professional books, a large pamphlet and government publication file, selected subscriptions to news and research services, North Carolina public schools files, all PREP materials, selected dissertations on microfiche, and files on ERIC Clearinghouse activities. Publications of an about the State Department of Public Instruction dating back to 1850 are maintained, as are the North Carolina Public School files of evaluations, publications, special programs, handbooks, and special surveys. The acquisitions budget for fiscal year 1969-1970 was $11,166.)

Services and Products

The Center staff provides various information services to Department personnel and others in the educational community. Information products are prepared regularly on topics of current interest to the State educational community: future information needs are anticipated whenever possible in the selection of topics. Literature searches are conducted through the ERIC products, as well as their own reference collection. For some requests, a computer search of material will be performed. From the resulting list of titles, the most pertinent ones are retrieved on microfiche for further examination.

To the extent possible, packages prepared are tailored to the needs of the requester. These might contain any or all of the following forms of information: basic bibliographies, annotated bibliographies, reprints of relevant articles and documents, in their entirety, for the State Department and the local educational agency personnel; reproduced ERIC microfiche; written reviews; summaries and precis of selected documents; and formal reports.

Several types of products are prepared by the Center staff. "Emphasis" is a weekly subject listing of current magazine articles and pamphlets too new to be listed in the standard indexes; "ERIC Instant Research" is an annotated subject bibliography covering ERIC documents pertaining to topics of current interest in the State Department and elsewhere; and "Recent Acquisitions" is a publication listing new and/or noteworthy books acquired by the Center. Annotated subject bibliographies resulting from ERIC computer searches and comprehensive reviews of the literature are issued on an irregular basis. Kits containing comprehensive information about the State, the Department, the ERIC program, the Research and Information Center, and other useful information for new staff members are also distributed.

Information requests are received by telephone or letter, and in person. During the month of April 1970, approximately 175 clients were assisted by the Center.

Internal Procedures

The Center employs conventional library procedures for the acquisition and circulation of materials. The Library of Congress system is used for cataloging and processing books. Statistical reports are prepared for acquisition, circulation, finances, users, and ERIC searches. Most of these procedures are handled by the library assistant and part-time clerk.

User Information

Users served include college and university students and faculty, public school personnel, the Research and Development Department staff, other State agencies, and some out-of-state educational personnel. The Center receives feedback on some of the disseminated products, such as the "ERIC Instant Research." However, no formal survey has been conducted.

Involvement of Users and Parent Organization

The involvement of the State Department staff is actively sought in the acquisition of materials and in the identification of the user needs. Personal contacts are made to learn individual professional needs.

Cooperative Efforts with Other Information Centers

Services are provided for the Regional Educational Laboratory, the North Carolina State Library, the University of North Carolina Library, North Carolina State University Curriculum Center, the Learning Institute of North Carolina, and the South Carolina Department of Education. The Center, in turn, borrows books and reference materials from these agencies.

Keys to Success

The staff believes that the attitude of the people providing services determines how they are used. Foremost, they strive to serve people pleasantly. In performing searches, all available resources are exhausted. The Center is open 24 hours a day and no rules and regulations for borrowing or circulation have been established, nor are there time limits or fines. People to people contacts are emphasized.

Special Problem Areas

The present shortage of personnel and space is a limitation in the services that could be provided. The staff frequently contends with a considerable backlog of requests, in addition to the urgent requests for on-the-spot or 24-hour responses

Future Plans

Plans for expanded service are being made with the allocation of additional State and Federal monies. The facility will be increased and three additional professional personnel will be hired. In addition to expanding the present services, the Center is proposing several new activities, including the following: testing of a computerized retrieval system for the ERIC files; development of a systematic statewide (and regional) ERIC dissemination program; provision of consultative services on dissemination to State Education Agencies in the region; and work with teacher training institutions in increasing prospective teachers' awareness of the information resources available. Underlying this growth of services is a broadened base of users to be served.

Appendix F

Research & Information Center
State Department of Public Instruction
Raleigh, North Carolina 27602

Educators' Bookshelf
April 27, 1971

INFORMATION DISSEMINATION AND RESEARCH UTILIZATION
A Selected Bibliography

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* Denotes documents on microfiche in the ERIC (Educational Resources Information Center) collection.

Prepared by: Mrs. Susan G. Wellborn

Procedures Manual for Operation

of

Model Dissemination Center

prepared by

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Procedures Manual for Operation of Model

Dissemination System

I. Introduction

The purpose of this procedures manual is to provide an instrument by which the operation of the Model Dissemination System may be effected and monitored. It is expected that the organizational structure, procedures, and forms will be flexible and subject to modifications as the operation of the system matures and the personnel responsible for providing these services gain experience and knowledge. As a consequence, all copies of this procedures manual are numbered and provisions are numbered and provisions are made for changes through the use of dated Revision Notices prepared and distributed by the Office of Project Management.

It must be noted that this project is funded as a research contract. Therefore, sufficiently detailed records must be maintained, not only as a mechanism by which the work is directed, but as a means of recording those data essential to program review and evaluation. Furthermore, and even though the organization of the Model System outlined in the proposal is quite similar to the "Theory Y" organization championed by Townsend, Up the Organization (1969), it is recognized that a strong leadership function is essential in these initial phases. To this end, a functional organizational pattern, as shown in Figure 1, is to be adopted.

II. Organization

Project Management shall be the responsibility of the D' ision of Research. This office will be charged with the maintenance and

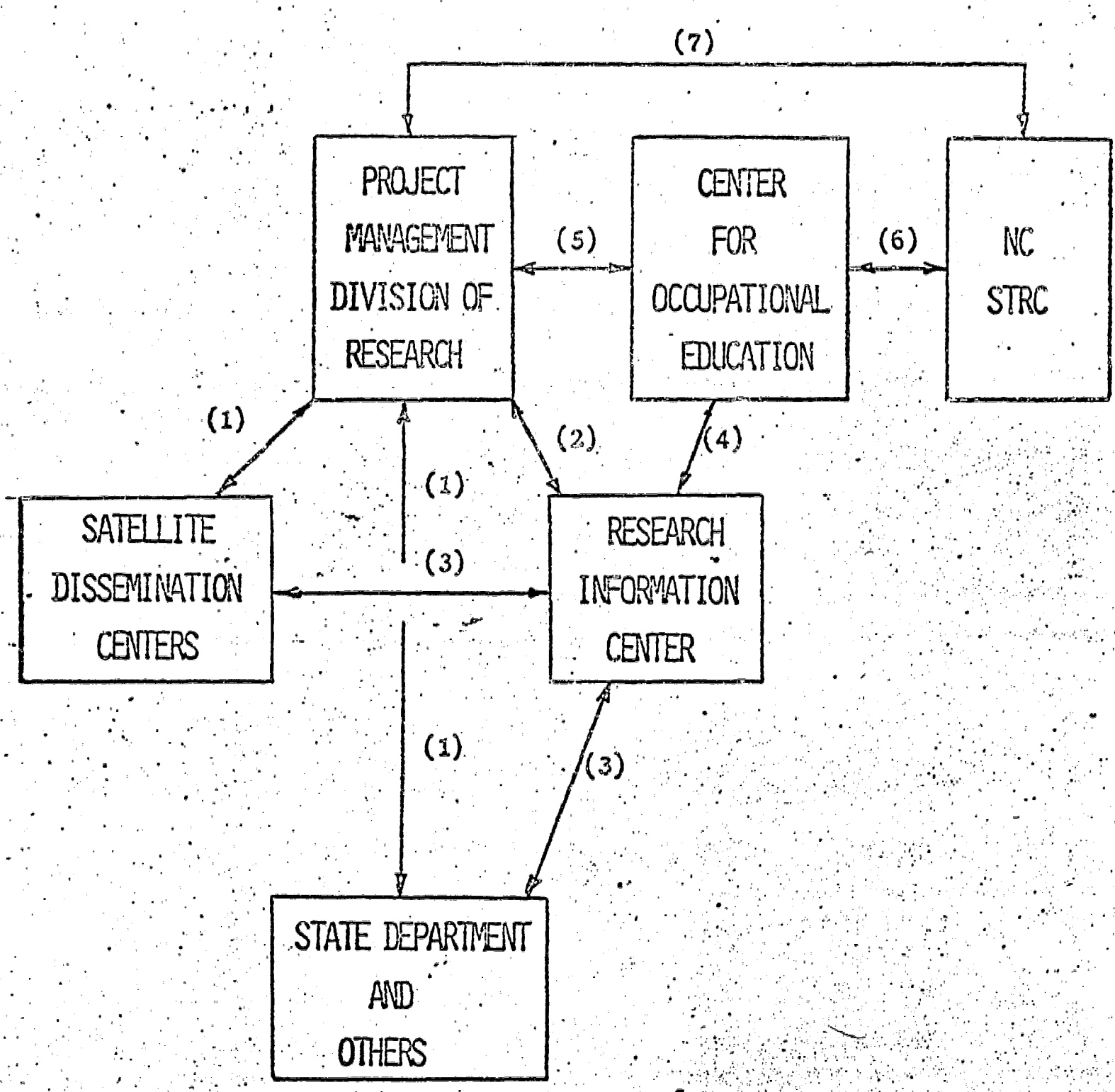


FIGURE 1

FUNCTION ORGANIZATION CHART - MODEL DISSEMINATION SYSTEM

distribution of this manual and with coordination, training, and initial direction of the efforts of other agencies involved in the program. These other organizations are:

- Research Information Center will be responsible for effecting the Information Retrieval functions, will prepare retrieval questions for computer or manual research processing, and disseminate and distribute to user groups and individuals those research results, reports, memoranda, and articles which are indicated to be of interest and value in the solution of problems.
- Center for Occupational Education will be responsible for processing of retrieval questions by computer and other contractural obligations specified elsewhere.
- North Carolina Science and Technology Research Center will provide assistance as requested by the Project Management and as practicable to the maintenance and improvement of computer-based information systems.

The communication links specified in Figure 1 are to function as follows:

Link Number	Principle Functions
(1)	The Project Management is to determine the criteria for selection of Satellite Centers, and suggest methods of organization and operation. Once these Centers have been defined, the Project Management is to provide instructions and guidance to member personnel in the use of sophisticated information retrieval techniques, encourage their cooperation and activity in the use of services offered by this project, and the evaluation and

development of reports essential to its operation and evaluation.

(2) This link provides for communication between the Division of Research and the Research Information Center. Principle operatives within the Research Information Center will be the Research Analysts. Project Management will be responsible for instruction of the Research Analysts in the full uses of computer based information retrieval techniques and assist them to become expert in the full capabilities of the system. They will be responsive to user requests for information services, will prepare computer or manual searches as the needs of the user dictate, and will distribute research reports to them as a dissemination activity.

(3) This is the principle communication link within the organization, for it is through this channel that the retrieval/dissemination function occurs. Its effectiveness will be determined to a considerable degree by the successfulness of links (1) and (2) and the function of the Satellite Centers and the Research Information Center as they seek to implement the organization outlined above.

(4) Computer based research requests are to be filed along this path. Search statements will be submitted to the Center for Occupational Education where they will be processed and submitted to the computer, and the results returned to the Research Information Center.

(5) This link provides for communication between the Project Management and the Center for Occupational Education for purposes of maintaining the performances of the Center and its use of the computer based retrieval system and other contractural obligations of the Center to the Division of Research.

(6) Requests for computer based searches are submitted from the Center for Occupational Education and are monitored by Science and Technology Research Center which is responsible for system maintenance and operation. (Searches are processed on the IBM S/360-75 of the Triangle Universities Computation Center.)

(7) An additional link is maintained to the Science and Technology Research Center for purposes of coordinating system changes and improvements in file content and research output.

Forms and Procedures. It is essential that the communication links shown in Figure 1 be formalized and reinforced through the use of prescribed forms and procedures. The basic means for control and report generation will be a General Ledger. This ledger is to be maintained by the Project Management for purposes of study and evaluation of the performance of the several communication links and project units. It will not serve as a mechanism for cost control or reporting in the sense of a financial ledger. Ledger entries will be used to maintain records of bibliographies, searches, search requestors, bibliographic content, information dissemination and document distribution, and general man hour and machine time requirements. The ledger will be used as a key to data generated by the project, and will serve as the key to the file of bibliographies from which evaluation and report findings are to be drawn. Each bibliography is to be considered as a separate file. All forms, letters, comments relevant to preparation of the bibliography are to be retained in this file as a permanent record.

Form MDS-1, Statement of Research Question is the primary instrument through which the user presents his request for information services. It is through this means that the project obtains the necessary statistics concerning the user: Who is he?, where is he located?, what is his background?, what is the reason for his requesting retrieval services? When this form has been satisfactorily completed, the Research Analysts should have a clear and concise statement of the research question submitted by the user. This form serves to enforce the communication between the Satellite Centers and the Research Information Center and functions primarily in support of link (3) in Figure 1. Certain of the information from this form, in particular the principle statistics concerning the

Control Ledger. This form, when completed, becomes the first formal entry into the file for this bibliography. Form MDS-1 is provided in three separate units; MDS-1.1, MDS-1.2, and MDS-1.3, depending upon the originating source of the request. MDS-1.1 is to be used by members of the Local Education Agencies and the Satellite Centers. This form is on canary paper. Form MDS-1.2 is to be used by colleges and universities and is on green paper. Form MDS-1.3 is to be used to process State Department requests and is on blue paper.

Form MDS-2, Search Strategy. This form is to be used, in the main, by the Research Analysts in the Research Information Center for purposes of transmitting the formal search strategy to the Center for Occupational Education. It should be noted that more than one Search Strategy may be submitted for a bibliography, and it is certainly expected that this will occur. In addition to the search statement, this form will be used as a means of obtaining search statistics, labor, and computer time required to complete the problem. As a consequence, this document may also be considered as the principle means of support for a simple job-cost system which will be used to provide data for cost and timing studies. This form is on white paper.

Form MDS-3, COE Computer Search Journal. This is a simple journal to be used within the Center for Occupational Education. A record is to be kept of all problems submitted to the computer. This record will include date received, date submitted, and date the problem was returned to the Research Analyst who requested the computer run. Certain statistics concerning computer cost and labor will also be maintained.

Form MDS-4, Response and Document Transmittal. After the research problem has been returned from the computer and has been reviewed to the satisfaction of the Research Analyst, a copy of the computer output along with this form will be presented to the person who made the original request. He will then use this form to request abstracts, documents, microfiche, or, in some cases, further revisions of the research statement. It is by this means that control is maintained and records provided concerning documents and material sent from the center to the user. This form reinforces communication link (3), and is on buff-colored paper.

Form MDS-5, General Bibliographic Ledger. This ledger is an instrument by which control is maintained over search requests, document orders, and research analyst's time within the Research and Information Center.

Form MDS-6, User Commentary. Upon successful (or, as the case may be, unsatisfactory) processing of the research questions and review of literature and materials received from the Research Information Center, the one who requested the search will give written comments concerning his opinions of the manner in which the problem was handled, the quality of the material received, and any points which he feels might serve to improve any future operations. It is anticipated that this form may be completed in a personal interview, but, barring this, it may be considered as a quantitative and qualitative questionaire by which the users reaction to the program are obtained. This form is on cream-colored paper.

IV. Priorities and Packaging Guidelines

Priority Definition All searches submitted through the MDS network will be given equal priority in terms of processing and will be handled, insofar as

is practicable, on a first in-first out basis. Exceptions to this general rule will be made upon mutual agreement between MDS Project Management and RIC Supervision. Priority of searches submitted to the RIC outside the MDS structure will continue to be set in accordance with RIC normal operating procedures.

Packaging of Research Material One of the principle advantages of this program is the freedom to improvise, experiment, and present research material in various ways. Consequently, Project Management shall have as one of its primary functions the authority to prescribe packaging format for research material primarily as a result of contact with members of the Satellite Centers. In this same vein, it will be the responsibility of Project Management to analyze and report the results of such packaging. It is anticipated that the normal packaging of searches will follow the lines set forth in the Search and Document Request Forms presented elsewhere in this manual.

APPENDICES

I. Operational Procedures Applicable to Research Information Center

II. Cost Accounting and Report Generation Procedures

III. Structural and Procedural Organization of Satellite Centers

APPENDIX I

The Research and Information Center

I. Introduction and General Description

A general description of and services offered by the Research and Information Center are presented in Exhibit A. This informal brochure relates a brief historical and operational view of the Center and is distributed to State Department staff and other users as part of a general information packet.

The Research and Information Center is an organic member of the North Carolina State Department of Public Instruction, and is under the Department of Planning and Research. It provides access to reference and informational materials along two principal lines - a standard reference library supported by subject and informational files and an information service based upon reference material and indices provided by the Educational Research Information Center (ERIC).

II. Staffing and Organization

Staff positions are designed to support these services; a functional organization chart is shown in Exhibit B. Staff responsibilities are along functional lines, with overall responsibility for operation of the Center being that of the Director.

Exhibit A

Research & Information Center

State Department of Public Instruction / Raleigh, N. C.

Background . The Research & Information Center was created in 1960 with State funds as a supportive arm of the SEA and served SEA staff only. Later, federal funding (NDE , Title III) made possible the expansion of the Center's facilities and its holdings. The advent of ESEA opened new vistas, and Title V funds were made available to implement the ERIC program on a limited basis, to purchase needed equipment, to add professional materials, and to secure an additional staff member.

Little publicity has been given the Research & Information Center; gradually, however, news of its services, facilities, and holdings has spread throughout the State and more and more educators are requesting use of its services and facilities. Users of the Center have become its best advertisement.

Facilities . Presently the Center's facilities, holdings, and services are used by approximately 400 educators monthly. Clients include staff members of the SEA, public school personnel, college and university faculties and students, and personnel from other State Agencies. The mailing list, formulated in terms of requests only, now totals 375 in- and out-of-State users of the dissemination activities generated by the Center.

Personnel . Total personnel of the Center now includes three full-time people and a part-time clerk. Facilities include areas for reading, studying, browsing, reference work, research, ERIC documents and hardware, and processing--a total of five average size rooms.

Collections . Collections maintained encompass a comprehensive store of research information and resources including:

- Back (microfilm) and current issues of 275 journals
- Selected dissertations on microfilm
- Basic education indexes and abstracts
- Standard references
- Collections of annotated bibliographies

- Complete ERIC dissemination on microfiche and all ERIC products
- Relevant pamphlets and government publications
- Subscriptions to news and research services
- Files on ERIC Clearinghouse activities
- Special files on North Carolina public schools
- Equipment for reproducing materials: copying machine for printed materials and a reader-printer for ERIC documents on microfiche and for microfilm

In addition, cooperative arrangements have been made with regional libraries and centers for supplementing the resources of the Research & Information Center.

Services . As an integral part of the State Education Agency, the Research & Information provides a wide variety of services:

- Leadership activities enabling SEA personnel and others to become aware of all materials in the extensive collections now available and to use these materials to greatest advantage within the Center itself.
- Leadership activities, varied in terms of user needs, in the broad area of education information dissemination. These activities include those requested and those initiated by the staff in anticipation of user needs.
- Leadership activities to keep personnel in the SEA and other educators continually aware of specific educational activities, completed and in progress, throughout the State and the nation. These activities place considerable emphasis on promising innovative practices.
- Execution of policies and processes which result in a centralized ordering and processing system; and a centralized storage, retrieval, and dissemination system for comprehensive materials collections.
- Evaluation of all incoming pamphlets, brochures, position papers, government publications, inter-state publications, and the like.

Techniques . Techniques employed in rendering these services include:

- People-to-people contacts within the Center--individual and small group--for purposes of orientation and information, with appropriate use of A-V aids, demonstrations, and discussions

- Face-to-face consultative services; to the degree possible, with personnel in public schools, colleges and universities, and educational organizations, relative to the administration and organization of the Center and the ERIC program in particular

- Preparation and distribution:

  EMPHASIS, a weekly subject listing of current magazine articles and pamphlets too new to be listed in the standard indexes

  ERIC INSTANT RESEARCH, an irregular annotated subject bibliography covering ERIC documents pertaining to topics of current interest in the SEA and elsewhere

  RECENT ACQUISITIONS, an irregular publication listing new and/or noteworthy books acquired by the Center

  ANNOTATED SUBJECT BIBLIOGRAPHIES, an irregular publication issued as a result of ERIC computer searches and comprehensive reviews of literature

  INFORMATION KITS, containing comprehensive information about the State, the SEA, the ERIC program, the Research & Information Center, and other useful information for new staff members

- Computer retrieval of information on specific subjects stored in the ERIC system

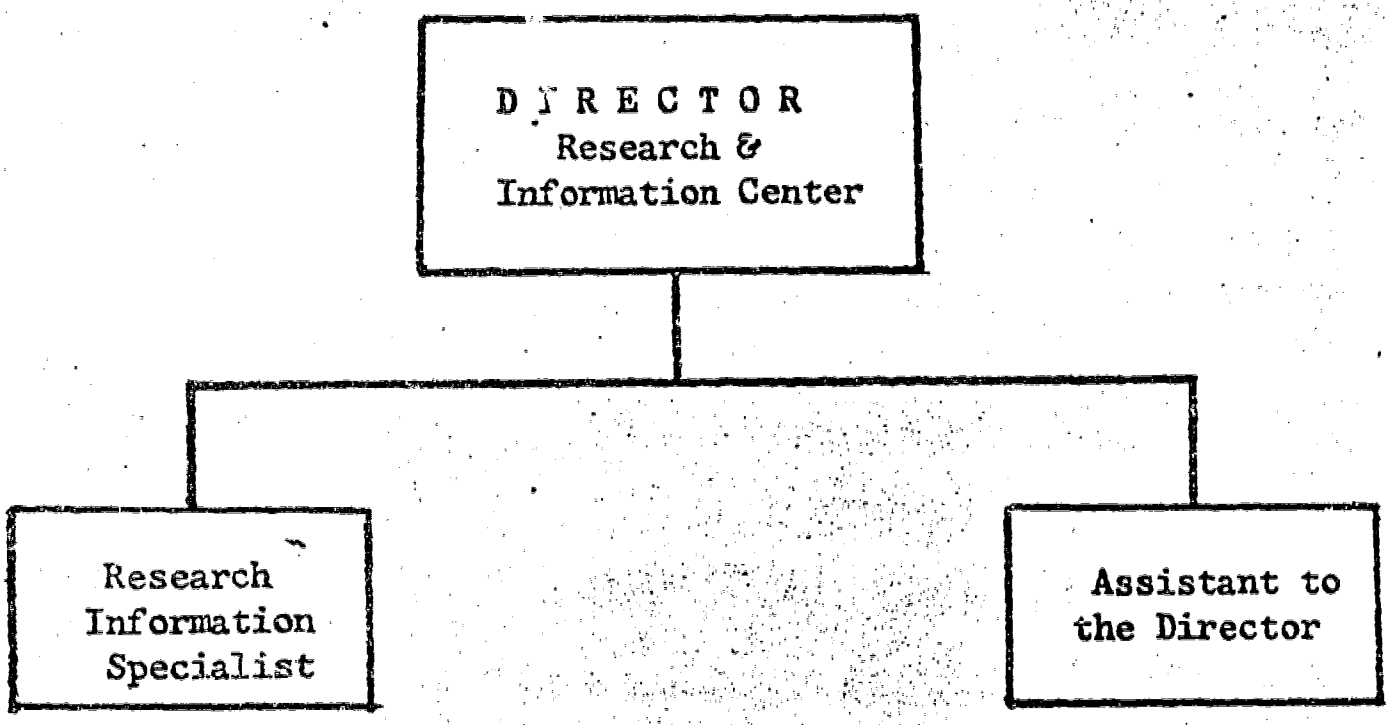
- Research on educational topics with preparation of precis

- Information dissemination by letter and telephone

Not only are these services recognized for their intrinsic individual worth, but in totality they tend to serve as a unifying force among personnel within the SEA in terms of purpose, relevance, and accountability.

STAFF: Mrs. Gladys Ingle, Director
Mrs. Barbara Crevar, Assistant to the Director
Mrs. Susan Wellborn, Research & Information Specialist
Miss Ruby Jones, Clerk

PHONE: 919-829-7904



F U N C T I O N A L O R G A N I Z A T I O N C H A R T

The Research & Information Center

Exhibit B

III. Holdings and Reference Collections

The Center's reference materials are arranged into two essentially independent file - the ERIC material and the Professional Reference and Journals File. Access to the ERIC collection is provided by the Research Information Specialist who furnishes indices, microfiche, and prepares computer-based literature search services to State Department personnel. Access to the Professional and Journal files, including "vertical information" files relating to pamphlets, etc., is through the Assistant to the Director. Standard reference library procedures are in use to permit checkout of books and pamphlets. Journal files are for use in the Center only.

Acquisitions are budgeted and selected by the Director. Because of the limited number of staff personnel, it is essential that duties and responsibilities be shared. The functional chart shown in Exhibit A is not rigid, but is flexible insofar as circumstances will permit.

IV. Publications and Informational Material

The Research and Information Center provides annotated bibliographies and other reference material on regular and non-regular basis. These are:

- Research and Information Center Emphasis: an annotated bibliography of Subjects of Interest to Educators available through the Professional and Vertical file.
- Instant ERIC: an irregularly published annotated bibliography of recent materials available through ERIC.
- Educator's Bookshelf: an annotated bibliography of recent Educational Topics, combining Emphasis and Instant ERIC.

- Recent Acquisitions
- Educational Newsletter: an educational research service published by the Director on an irregular basis.

APPENDIX - II

COST ACCOUNTING AND REPORT GENERATION PROCEDURES

I. Definition of Cost Components

The principal cost unit of this project is a bibliography which contains the initial request statement, computer-based searches, and the citation data, abstracts, microfiche, hard copy reports and resumes required to satisfy the user's request. In many cases one computer run will provide sufficient information to enable an acceptable b. liography to be pre-pared, but this will not always be the case.

There are four essential components involved in definition of costs for processing of computer-based searches.. They are:

1) direct computer costs for processing searches either individually or in batch. The direct computer cost per search is dependent upon the number of terms, the sum of postings, search logic and depending upon the type of output desired, the number of output hits. When possible, the com-puter cost will be taken directly from machine output. If more than one search is submitted in a batch run, then the time per search is the batch time divided by the number of searches per batch.

2) Computer Overhead Costs are those costs incurred in development of search and bibliographic files. This involves manipulation of the RIE and CIJE files as received from the clearinghouse and their restructuring into formats compatible with STRC-IVS. Other overhead costs are rental or computer storage media such as magnetic disk and tape. All overhead costs should be amortized over the total number of searches run during the year.

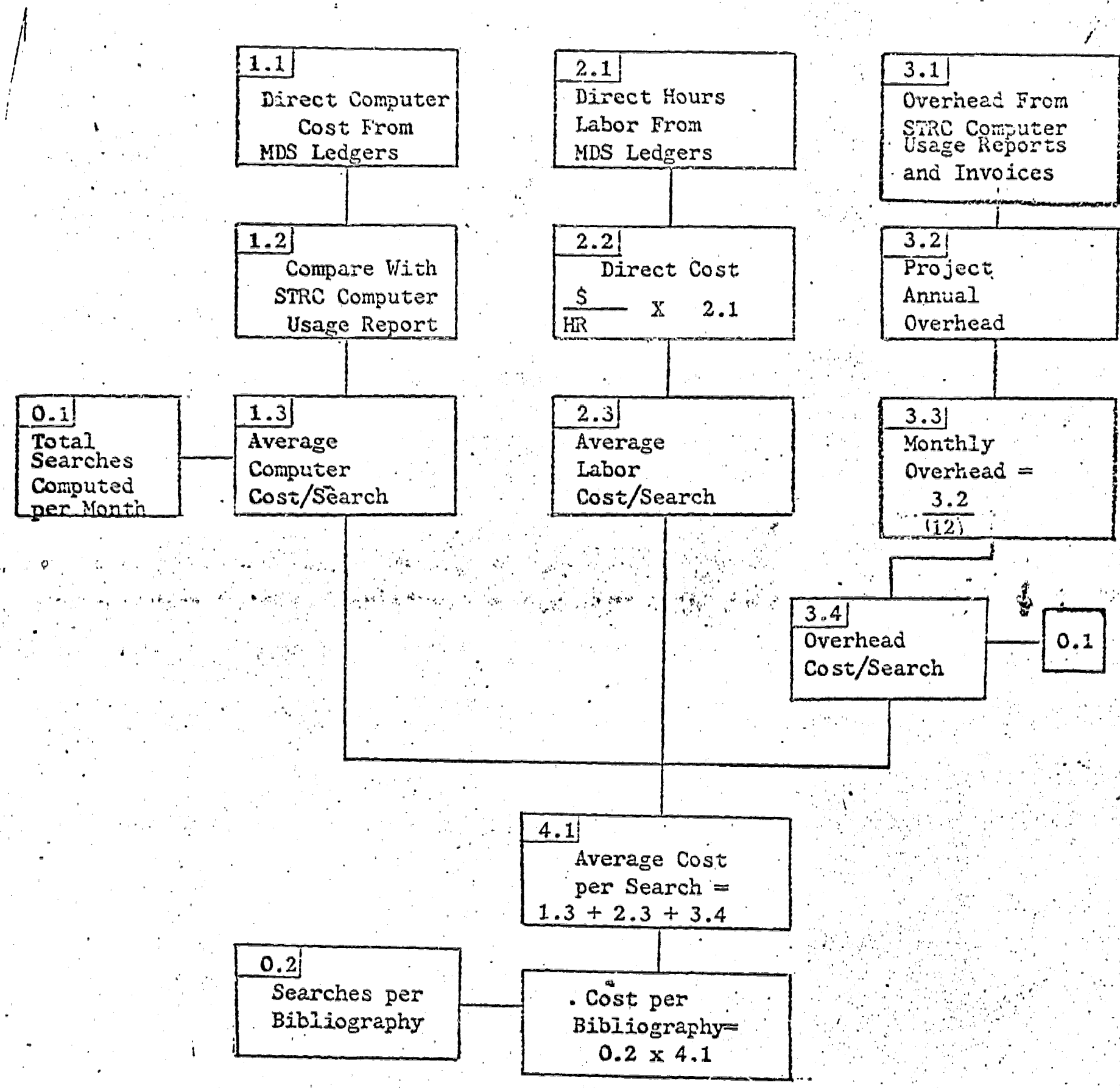


EXHIBIT A

PROCEDURE FOR COMPUTATION OF AVERAGE SEARCH AND BIBLIOGRAPHY COST

3) Labor Costs incurred by Research Analysts and other Project employees involved in development of computerized search statements, editing search output, writing search resume, copying microfiche, and conducting manual searches. These costs are direct only and do not include supervisory costs. For purposes of this project, there are essentially two types of labor associated with preparation of computer searches and compilation of bibliographies. These may be classified roughly as analysis time and clerical time - though the possibility exists that any one analyst may perform both kinds in the normal course of his duties.

Analysis time is that time spent in the analysis of user requests, either in personal conversation or review of written requests; preparation of search logic statement, review of output, and report resume. The time spent in analysis is to be reported on Form MDS-2.

Clerical time is that time spent in such activities as pulling microfiche from files, replacing them, copying microfiche, and typing from prepared manuscripts. Clerical time will be reported in Forms MDS-3 and MDS-4.

It is essential that we have a break down of the amount of time spent in each activity.

In line with standard cost computation within government agencies, no overhead costs are to be assigned for office usage, supplies, etc.

4) Copy Costs are those costs incurred in the reproduction of hard copy from microfiche, reproduction of the complete microfiche itself, or reproduction by some other means such as Xerox, 3M, etc. Copy costs will be taken from the document records listed as Form MDS-4.

II. Location of Cost Components

The forms provided in the main body of this report include space for notation of direct computer costs and labor costs, which are to be summarized in the ledger. Other cost reporting instruments to be used are the computer usage invoices prepared by STRC from reports obtained from the Triangle Universities Computation Center. These reports provide information concerning breakout of overhead costs and direct costs. (The total of all direct costs obtained from MDS forms should equal that obtained from the STRC reports.) Other overhead costs are obtained from invoices from vendors which supply magnetic disk and tape. Magnetic disks are billed on a rate-per-month basis whereas magnetic tapes are purchase items. Both are to be included as overhead cost elements.

III. Projection of Overhead Costs

Most of the overhead costs can be projected readily since rental fees for storage space is fixed, and the cost per update of the files is relatively constant. Consequently, if the number of updates per year per file is known, then, barring unforeseen difficulties, projection of overhead costs should be a simple matter.

IV. Computation of Search Costs and Preparation of Reports

Computation of Search Costs, including projection of overhead, is the responsibility of Program Management. This section presents the procedure by which costs are to be determined and the manner by which costs are to be summarized and reported. Search costs will be computed each month in accordance with the chart shown in Exhibit A. No distinction will be made between searches run on the RIE or the CIJE files for costing purposes.

Computation of average Bibliography Costs will be made based upon the number of computer or manual searches per bibliography plus labor, overhead, and reproduction. Monthly summary reports will be prepared which indicate the average cost per month and the cummulative averages as shown in Exhibit B.

APPENDIX III

SATELLITE CENTER ORGANIZATION

It is anticipated that the organization of the Satellite Centers will be flexible from the point of view of Project Management. The purpose of this appendix, then, is not to lay out specific organizational details, but to indicate general guidelines by which relationships among the Office of Project Management, the Research and Information Center, and the Satellite Centers may be directed.

Project Management will encourage each Satellite Center to appoint one person as Center Coordinator and to act as the capacity of an Information Officer. This person will serve as a means of contact between the Program Management and the several members of the Satellite Centers for scheduling of training sessions and discussions; and the Research and Information Center for purposes of transmitting and, at times, receiving search and document requests. Therefore, it would seem logical that the party described above would have an office and have access to secretarial help.

One other requirement is that the Satellite Centers have access to centrally located office and library space for storage and use of the microfiche readers. It would be advantagious if this location were in or near a library in which other reading matters and research literature were available.

AN INFORMATION RETRIEVAL

OPERATIONS MANUAL

FOR

RESEARCH ANALYSTS

Dennis M. Phillips
Systems Consultant

Robert C. Evans, Jr.
Educational Research Coordinator

MODEL DISSEMINATION CENTER
N. C. STATE DEPARTMENT OF PUBLIC INSTRUCTION
DIVISION OF RESEARCH
RALEIGH, NORTH CAROLINA

November 6, 1970

MDC Research Analyst Operations Manual

I. Introduction to The Model Dissemination Center

II. Introduction to Information Retrieval
   A. The Language of Retrieval - Vocabulary
   B. Logical Statement of Retrieval

III. The Psychology of Retrieval
   A. Understanding the User
   B. Understanding the User's Problem

IV. Introduction to STRC-IVS
   A. System Design, Structure and Use
   B. System Capabilities and Limitations

V. Evaluation of the Retrieval Function
   A. Review of Search output in terms of the User's Question
   B. Review of Abstracts and Literature in light of the user's needs

An Information Retrieval Operations Manual

For Research Analysts

I. Introduction to the Model Dissemination System

The purpose of this manual is to provide Research Analysts and other interested parties with an introduction to the operation of computer based retrieval systems. Although an attempt is made to keep the focus broad and to avoid focusing upon our particular retrieval system or file; the nature of the study contract under which this system operates makes it imperative that direct attention be given to the information system developed and in use at the North Carolina Science and Technology Research Center (STRC) and to the Educational Research Information Center (ERIC) files: Research in Education (RIE) and current Indexes to Journals in Education (CIJE).

The principal thrust of the Research Analyst position is to respond in a timely and productive manner to requests for information generated written the State Department, the Local Education Agencies, and the students and faculty at Colleges and Universities who have a need and authority to use the system. Appropriate procedures and forms have been adopted and approved for use in the operation of the system and are to be used in lieu of all preceding focuses and procedures. It should be taken very much to heart that the problem of information collection and distribution can be solved efficiently and effectively if, and only if, one uses the proper tools and instruments. The basic tool for operation of the dissemination effort is the retrieval system. The instruments are the forms contained within and described

by the Procedures Manual. This point is even more heavily emphasized by the fact that the retrieval system resides in a computer - strict adherence to proper operational techniques is absolutely essential if this system is to be used properly. Furthermore, the objective of this study is to provide information to people - large numbers of people with many and diverse backgrounds. The only way in which we can assure ourselves and administrators that the needs of these people have been responded to is by the written record. This is especially the case when one is involved in a project with a research orientation. We do not expect that all services will be satisfactory. We do not expect to meet everyone's needs. But we do require written evidence which will enable us to determine quantitatively as well as subjectively the degree to which problems have been resolved and the extent to which educational needs, whatever they might be, have been met. To continue - this project is intended to serve as a model for extended development. If this point is to be satisfied, accurate and complete cost records are mandatory. Cost records can only be obtained if proper attention is given to completion of operating forms and instruments.

II. Introduction to Information Retrieval

The term, "information retrieval", is something of a retreat into jargonism. Any library or research center operation is an exercise in information retrieval. We specifically imply by the term "information retrieval" the use of computer based and published indices in order to obtain a list of documents, research reports, books, periodicals, etc. which are relevant to a stated need for documentation to support work or to enlighten requestors in a specific

interest area. In this context, we might well refer to the operation of a document retrieval system. The computer is an index to documents and reports, just as are the published indices. Nothing in the RIE or CIJE files which is not covered in the published indices is available from the computer. The documents themselves are not stored in the computer, but are stored in trays and on shelves in the form of microfiche and hard copy. To this extent, the computer based part of the system can be considered as a very complete and flexible index to the documentation available in these forms. It is true that certain bibliographic data are obtainable from the computer, but the principle output is a list of ED numbers which lead to the specific microfiche to be used. The effective use of this index is dependent upon the technique and expertise of the Research Analyst. These techniques are not overly complex, and the level of individual expertise required is not great -- it can be considered almost entirely a matter of attention to detail.

A. The Language of Retrieval-Vocabulary

The RIE and CIJE files contain tens of thousands of documents which report work done in almost every conceivable phase of educational research. Without some structured form of indexing, the problem of identifying a few reports or journal articles from this vast array would be insurmountable. For this is not really unlike the problem of finding a needle in a haystack; but is more like the problem of finding one particular straw from among the pile of straws which make up the haystack. The problem is one of description of specific identifying characteristics, and then of structuring those descriptive identifyers in such a way as to specify completely the nature of the document (straw) which we need to find. This first part deals with the language or vocabulary of retrieval - the next part describes the structure of the language and the way the vocabulary is used in order to 'retrieve' a list of relevant documents from the file.

The basic philosophy used to create the index to the ERIC files is that of 'concept coordinate indexing'. All this means is that words (descriptors) are selected from the ERIC Thesaurus, see page 5, as being those which most nearly describe the ideas and contents of a paper or report. This is done manually at the ERIC Clearinghouses by people who read the report and then select appropriate thesaurus terms to describe the paper. There may be as few as one or two such terms per report or there may be as many as twenty or thirty. Two separate groups are chosen - one group which are taken directly from the ERIC Thesaurus and another (identifiers) which are not found in the thesaurus but which constitute an open list of terms and

usually denote items of specific interest to the paper at hand. Research Analysts working with the retrieval system developed at STRC do not need to concern themselves with these differences since the computer system groups each set of terms to create one list of keyterms; all of equal significance. (This is not, however, the case insofar as the published indices are concerned. Read the instructions printed at the beginning of the published RIE and CIJE indices for instructions on their use.) In addition to the Thesaurus, STRC provides a list of authorized descriptor terms, sometimes called the STRC Dictionary, along with the number of reports in the file which have been indexed under those terms. These terms appear in alphabetical order, and are not presented in the structured thesaurus form. It is this list which must be used to prepare requests for computer searches. An example of this is shown on page 7.

The descriptor terms were chosen from the ERIC Thesaurus. Some discussion is indicated concerning the nature of this thesaurus and how it may be used. The procedure is based upon the idea that indexers will select those terms from the thesaurus which describe most specifically what the document is about. A Thesaurus is a closed, structured vocabulary. It is closed in the sense that newer words may not be added at the indexer's descretion, but only after a study group has determined that this newer word does in fact constitute a component of the educational vocabulary. It is structured in the sence that each term is keyed to others through a "hierarchical relationship." This hierarchical relationship, sometimes called the generic structure, is presented vertically and horizontally. The vertical structure implies that a word

Thesaurus of ERIC Descriptors
CCM Information Corporation
1970

DESCRIPTORS

ABBREVIATIONS 080
UF Acronyms
RT Mnemonics
Orthographic Symbols
Stenography
Writing

ABILITY 010
UF Low Ability
NT Academic Ability
Cognitive Ability
Creative Ability
Intelligence
Language Ability
Nonverbal Ability
Predictive Ability (Testing)
Psychomotor Skills
Reading Ability
Student Ability
Verbal Ability
RT Ability Grouping
Ability Identification
Achievement
Aptitude
Aspiration
Complexity Level
Gifted
Handicapped
Mechanical Skills
Performance
Productivity
Slow Learners
Talent
Talented Students
Vocational Aptitude

ABILITY GROUPING 280
BT Student Grouping
RT Ability
Ability Identification
Homogeneous Grouping
Low Ability Students

ABILITY IDENTIFICATION 010
BT Identification
RT Ability
Ability Grouping
Critical Incidents Method
Identification Tests
Probationary Period

ABLE STUDENTS 380
SN Ability to perform or absorb education at a specified level
UF Capable Students
BT Students
RT Academic Ability
Academic Achievement
Advanced Students
Average Students
Gifted
Superior Students

Abnormal Psychology
USE PSYCHOPATHOLOGY

Abreaction
USE CATHARSIS

Absenteeism
USE ATTENDANCE

Absolute Humidity
USE HUMIDITY

Absolute Pressure
USE PRESSURE

Abstract Bibliographies
USE ANNOTATED BIBLIOGRAPHIES

ABSTRACTING 330
BT Writing
RT Abstracts
Annotated Bibliographies
Documentation
Indexing

ABSTRACTION LEVELS 420
SN Levels of abstract reasoning reached in the process of developing successively broader generalizations reflected in language usage
UF Levels Of Abstraction
RT Abstraction Tests
Abstract Reasoning
Cognitive Processes
Comprehension
Conservation (Concept)
Language Learning Levels
Learning Processes
Semantics

DICTIONARY FOR THE ERIC CIJE FILE (THROUGH JUNE 1970) 8/13/70
PREPARED BY THE NORTH CAROLINA SCIENCE AND TECHNOLOGY RESEARCH CENTER

KEYTERM	NO. POSTINGS
ABSTRACTION LEVELS	9
ABSTRACTION TESTS	4
ABSTRACTS	7
ABT ASSOCIATES, INC.	1
ABU	1
ACADEMIC ABILITY	34
ACADEMIC ACHIEVEMENT	386
ACADEMIC ACHIVEMENT	1
ACADEMIC APTITUDE	18
ACADEMIC ASPIRATION	20
ACADEMIC EDUCATION	19
ACADEMIC ENRICHMENT	6
ACADEMIC FAILURE	12
ACADEMIC FREEDOM	60
ACADEMIC FREEDOMREELOMB ABU	1
ACADEMIC PERFORMANCE	100
ACADEMIC PROBATION	1
ACADEMIC RANK (PROFESSIONAL)	11
ACADEMIC RECORDS	3
ACADEMIC STANDARDS	28
ACADEMICALLY HANDICAPPED	5
ACADEMY OF INSTRUCTION	1
ACCELERATED COURSES	3
ACCELERATED PROGRAMS	6
ACCELERATION	9
ACCIDENT PREVENTION	12
ACCIDENTS	4
ACCOUNT APPROACH	1
ACCOUNTANTS	4
ACCOUNTING	28
ACCREDIATION (INSTITUTIONS)	1
ACCREDITATION (INSTITUTIONS)	24
ACCULTERATION	1
ACCULTURATION	27
ACCURACY	1
ACHIEVEMENT	111
ACHIEVEMENT ANXIETY TEST	1
ACHIEVEMENT GAINS	9
ACHIEVEMENT NEED	15
ACHIEVEMENT RATING	28
ACHIEVEMENT SCALES	1
ACHIEVEMENT TESTS	85
ACHIEVER PERSONALITY SCALE	1
ACHIM VON ARNIM	1
ACIDS	1
ACIR	1
ACL	2
ACLU	1
ACOUSTIC INSULATION	1
ACOUSTIC PHONETICS	7

conveys an idea or concept which is a member of some larger, or smaller group.

For example, the term READING CLINICS is given on page 341 of the Thesaurus of ERIC Descriptors, 1970 edition. This term is a Broader Term (BT) to the term REMEDIAL READING CLINIC, and a Narrower Term (NT) to the term CLINICS. This is seen below.

↑ BT	CLINICS		
NT	READING CLINICS	BT	↑
	REMEDIAL READING CLINIC	NT	

Subject specificity increases as one goes down (BT → NT) the hierarchical structure, and becomes more broad as one goes up the chain (NT→BT).

The lateral chain is shown in the Related Term (RT) structure. For example. READING is a Related Term to READING CLINICS, and vice versa.

READING ←(RT)→ READING CLINICS

The USE and USE FOR references are primarily intended to assist the user in the selection of authorized terms from among a list of synonyms. A complete description of the ERIC thesaurus, and instructions for its use, is on page 1 of the 1970 edition.

The Thesaurus does not include all of the authorized keyterms in use, because terms are added at a more frequent rate than publication. The STRC Dictionary should be consulted for the most recent list of authorized terms and postings.

As examples of the process of indexing, read the short poems and note the descriptors keyterms which have been selected. Notice that each entry to the file has an identifying number, a title, and an author. This group of information is sometimes referred to as citation data. Complete citation

data would include not only this list, but an abstract and information which would help one to find the full text. Notice that two sets of keywords accompany each entry - descriptors and identifiers. The descriptors are preceded by an asterisk (*) which sets them apart as being of primary importance. The document is listed under these "starred descriptors" in the published subject indices. Not all descriptors are used in this way - only the most important ones.

DP001001 Title: Early Marriage and Educational Development

Author: Peter P. P. Eater, Ed.D

Peter Peter Pumpkin Eater.
Had a wife and couldn't keep her
So he dropped her in the well.

Descriptors	Identifiers
Heterogeneous Grouping	Marital Difficulties
Water Resources	
*Student Behavior	
*Student Reaction	
*Family Relationship	
*Marital Instability	
*Marital Status	
Rural School Systems	

DP001002 Title: A Program with Primary Focus on the mentally handicapped Adult

Author: O. M. Hubbard

Old Mother Hubbard
Lived in a cupboard
Eating her curds and whey.
She stuck in her thumb,
and pulled out a plum,
and said, "what a good boy am I."

Descriptors
*Role perception
*Mental Health
Middle Aged
*Low Rent Housing
*Senior Citizens
Housing Opportunities
*Lunch Programs
Antisocial Behavior
Adult Education Programs
Parent Attitudes

DP001003 Title: A Short Comment on the Environmentally Oriented Ecosystem

Author: P. O. Possum

How pierceful glows the Hazy Yon.
How Myrtle-petaled thou.
For spring hath sprung
The cyclotron
How High Browse thou, Brown Cow?

Descriptors
Simulated Environment
Sciences
Reading Clinics

Identifiers
Hazes
Cyclotrons
Cows
Libraries

DP001004 Title: Agriculture Management and Commodity Distribution
Author: H. R. H. O.K. Cole

Baa! Baa! Black Sheep
Have you any wool?
Yes Sir! Yes Sir! Three Bags Full.
One for my Master,
and one for my dame,
and one for the Director of Research and Planning.

Descriptors	Identifiers
Supervised Farm Practices	Commodity Distribution
Part-time jobs	Wool
*Research	Master
Rural School Systems	Dame
School Administration	Director of Research & Planning
Parent Attitude	
Parent Child Relationship	
Farm Management	

DP001005 Title: Achievement Intervals and Differences within Closely-knot Social Groups
Author: T. L. Piggy, IV, Ed.D

This little piggy went to UNC
This little piggy stayed home
This little piggy was a drop-out
This little piggy was an over-achiever
and got his Ed.D

Descriptors	Identifiers
*Low Ability Students	Over-achiever
Students	Student Behavior
Cultural Conflict	Student Reaction
*Rehabilitation	
*Able Students	
*Graduate Students	
*Slow Learners	
*Dropouts	
*Mental Retardation	

DP001006 Title: Contributed Reflections

Author:

"The Time has come," the walrus said
"To talk of many things,
Of ungraded schools and T & I,
and whether pigs have wings!"

Descriptors	Identifiers
Aviation Technology	Ships
*Vocational Schools	Marine Science
*Audience Participation	Animals
*Guidance Counseling	
*Counselor Role	
*Communication (Thought Transfer)	
*Instruction	
*Inservice Education	

B. The Statement of Retrieval Questions

Once the appropriate descriptors and identifiers have been chosen and the computer file developed, the problem becomes one of obtaining, or retrieving, those documents of interest to us from that file. Remember that we do not know specifically which documents are in the file - we have only a subjective statement from the requestor concerning his problem. The hope is that there will be something relevant to his question in the file. We must now state his problem in such a manner that it will be acceptable to the retrieval system. As yet we have been unable to develop a computer system which will respond to a direct question: "Give me those documents which contain research information on students who are slow learners, have dropped out of school or have had slow progress." To be able to operate a machine system like this would be quite handy, and would simplify the analyst's job somewhat. But there are other ways to state this question, which, to a certain extent, are more effective than the subjective statement written above.

The objective of the information retrieval effort is to obtain a list of document numbers, citation data, abstracts and eventually, documents which contain information on the subject of interest to the person who requested the search. We must state the user's questions in specific terms acceptable to the system. The basis for statement of the retrieval question is the indexing technique which was used to put documents into the system. The problem is to restate the question in terms of the authorized descriptors using logical operators. There are essentially three such operators, called "logical" and '(intersection)', "logical or" (union), and "logical not" (negation).

Logical Intersection

Here is how they work. Assume that we want to restate the subjective question at the beginning if this sentence in logical terms. What are the concepts of interest? Look in the thesaurus for the terms

Slow Learners

Dropouts

which describe the idea of the sentence. Now we want all documents which contain information on both these topics. This may be stated in another way: We want all documents which have been indexed under both Slow Learner and Dropouts. This may be written symbolically

(Slow Learners) · (Dropouts)

Where the dot (·) indicated the operation of 'logical intersection'.

A quick scan through our file shows that document number DP001005 meets this requirement.

Another way to write this would be in equation form:

A Slow Learners

B Dropouts

Logic Equation: A · B

Logical Union

Now let's pose another question. Suppose we were interested in student-parent relationships, but not specifically related to any particular aspect

of this relationship. We would find in the thesaurus such terms as:

Parent Attitudes

Parent Child Relationship

Family Relationship

Now we want all documents on either Parent Attitudes or Parent Child Relationship or Family Relationship. This could be written:

(Parent Attitudes) + (Parent Child Relationship) + (Family Relationship)

Where the plus sign (+) indicates the operation of logical union. This might be written in equation form

A Parent Attitude

B Parent Child Relationship

C Family Relationship

Logic Equation: A + B + C

A quick examination of our files would show that documents number DP001001, DP001002, and DP001004 would satisfy the equation. However, we can also see that DP001001 does not concern itself with parent-child relationships, but is a paper on marriage relationships, so we should discard it as being not relevant. Had Mr. and Mrs. Eater had children, this might not have been the case.

Logical Negatives

It would have been possible to state the question on parent-child relationships in such a way as to exclude from the hit-list any documents which, although they were indexed under Family Relationship, were concerned with Marital Status or Marital Instability. To restate the problem, we want all documents on parent-child relationships but not on marital relationship. We would have then written the logic statement as:

(Parent Attitudes) + (Parent Child Relationships) + (Family Relationship) - (Marital Status)

The minus sign (-) indicates logical negation. This might have been written as:

A Parent Attitude

B Parent Child Relationship

C Family Relationship

D Marital Status

Logic Equation: A + B + C - D

It is possible to combine intersections, unions, and negatives all into one statement: List all documents on Slow Learner and Dropouts or Parent Child Relationship but excluding Marital Relationships

(Slow Learners) · (Dropouts) + (Parent Attitudes) + (Parent Child Relationship) + (Family Relationship) - (Marital Status)

This could have been written:

A Slow Learner

B Dropouts

C Parent Attitudes

D Parent Child Relationships

E Family Relationship

F Marital Status

Logic Equation: A · B + C + D + E ⊖ F

III. The Psychology of Retrieval

A. Understanding the User

You will notice that a considerable amount of space has been given in the Search Request Form provided in the Procedures Manual to the description of the person also in asking the question, his background, and his reasons for requesting retrieval services. The point is that in order to respond positively to the user's question; it is most helpful to understand the user, to have some idea of his position, responsibilities and duties, and to gain perspective on the way in which the information provided to him by the system will be put to use. Prior to development of any retrieval question, it is recommended that the information requested of the user concerning his background and use of the system be obtained and considered as a basis for any further discussion.

B. Understanding the User's Problem

The reason to try to gain an understanding of the user, be he in the LEA, State Department, or University, is to gain a better knowledge and understanding of his problem. For the most important task facing the Research Analysts is to be able to restate the user's question in specific terms acceptable by the retrieval system. You must enlist his aid in translating his problem; which will be presented to you in his own subjective terms, into these specific terms found in the thesaurus or list of authorized terms. Furthermore, you must be able to structure this list of terms into a logical statement which you understand and which will be acceptable to the computer.

The best way to do this is to have direct contact with the user. Do not hesitate to suggest words, word lists, or ideas which come to light as a result of studying the thesaurus. This particular approach will not only help you to understand his problems within the context of information retrieval, but will oftentimes enable him really to come to grips with his problem on a specific basis - sometimes for the first time. This "added attraction" of the retrieval function is often overlooked in favor of the volume of literature which is provided in response to a question, but the fact is that effective problem solving begins with a definitive problem statement. An effort to state a problem in specific and concise terms can be of considerable help in this regard.

If direct contact is not possible, it may be of benefit to contact the user by mail in order to get clarification on any concept you are not certain of. Barring this, your own research and study, are the best that can be obtained.

The retrieval function is neither one-way nor is it a cut-and-dried process of "put the question in the machine and accept what comes out." The retrieval system is designed to permit the analyst to interact, to change question statements, and to respond to system output before delivery of abstracts, etc. to the user. On some occasions it may be possible to obtain all that is needed with one computer run. This should not be taken as the order of the day. Use the system, and don't be afraid to try again if the first question statement failed to deliver relevant materials.

IV. Introduction to STRC-IVS

A. System Design, Structure and Use

STRC-IVS is the name of the information retrieval system designed, implemented, and in operation at the North Carolina Science and Technology Research Center (STRC). The system operates at the Triangle Universities Computation Center IVM S/360-75 computer; and may be accessed from terminals which are supported by TUCC, such as the IBM S/360-40 at North Carolina State University. Although the retrieval system was originally designed to process the National Aeronautics and Space Administration (NASA) files, it also has capability to process several other files - such as ERIC. In addition to the ERIC and NASA files, STRC-IVS provide retrieval services for the Department of Defense Unclassified - Distribution file, the Institute of Textile Technology file, and several smaller files. These files are described in the brochure from STRC which is included as an appendix.

It is not necessary for the Research Analyst to know or understand the inner workings of the computer system. But it is essential that you know the limitation which exist within the system and the maximum possible capabilities available from the system. These will be revealed as we provide through a step by step analyses of how an ERIC Search might be prepared.

How to Write and Submit an ERIC Search Request for STRC-IVS
(subtitle: The Research Analysts Handy Dandy Search Guide for Fun and Aggrandizement)

Proper processing of a search request begins with the proper execution of search writing procedures and execution of forms. These forms, descriptions, and procedures for their use are given in the Procedures Manual. This training manual gives the specific details on their completion and use.

The first form, MDS1.1, 1.2, 1.3, is used to obtain information about the user and to help the Analyst understand him and his problem. A sample completed copy is included here. The form begins, naturally, with identification of the user. Completion of the first items should take no more than four to five minutes, but should help you to get the conversation started and directed towards a definitive statement of his problem. Once this has been completed, the problem shifts to the user of the thesarus and dictionary.

These searches have been submitted to create a bibliography on the subject of "Community Support". Two computer searches are shown here - one for the RIE file and one for the CIJE. This is necessary since the two files are separate and distinct. The vocabularies should be the same for both files since they are both indexed in accordance with the ERIC thesaurus,

but this may not be the case as word usage and terminology can be expected to vary from the report to journal literature. The only way to check vocabulary consistency is to use the STRC Dictionary to make sure. Checking the dictionaries for both files is necessary anyway, since one needs to use these books to determine the number of postings listed under each term. The number of postings is used in several ways, one of which is to estimate the number of hits which might be obtained from a search. If the number of postings under a term is 10, then a single term search using that term will produce 10 documents or ("bits"). They are also used to predict the total computer time required to process a search - the more postings (usually) - the more time required.

Notice that the logic equation is arranged into three separate "groups." These groups are indicated by the use of left-right parenthesis. A group which contain only one term does not require parenthesis. The sample searches have three groups, but a given logic equation may have many more. STRC-IVS limits the number of groups per equation to 30. This and other limitations are shown in the following table:

Maximum Groups per Equation	30
Maximum Terms per Group	75
Maximum Characters per Term	30
Maximum postings per group	54,000
Maximum number of hits (at any time during search processing)	54,000

The machine will not process any search in which the limits specified in this table are exceeded. One can write an equation in which there are as many as 30 groups and 25 terms per group which means that as many as 2250 terms may be used in an equation. Another use of the number of postings for the STRC Dictionary is to arrange all terms within a group so that the number of postings increase from the first term to the last term in a group.

The last parameter in the table is difficult to explain and even more difficult to predict. The number of accumulated hits at any time during a search cannot exceed 54,000. Probably the best way to ensure that this parameter is not exceeded is to guess at the maximum value of each term and group operation and be sure that the maximum is less than 54,000. The method of arriving at an estimate of the number of hits in an intersection or union has already been discussed. Although the method can only be described as a wild guess in some cases, it will keep hits below the 54,000 mark. The only time to worry about this last parameter is when unions of terms with very high postings appear in an equation:

$$(A+B+C) \cdot (D+E+F+G+H)$$

Postings $\leq$ 54,000 Postings $\leq$ 54,000

Intersection

Postings $\leq$ 54,000

One restriction that is not in the Table is the position of the negation operator. If the negation operator ("NOT" or "-") is used in an equation, it can only appear in front of the last logical groups as a group operator. It cannot be used as a term operator in any case. This is shown as:

$$(A+B+C) \cdot (D+E+F) - (G+H)$$

There will probably be very few times that one will ever have to worry about these restrictions; but he should be aware that they exist if the occasion should arise.

With these limitations in mind, the Research Analyst proceeds to select appropriate terms and postings from the thesaurus and STRC dictionary. The example searches was taken from Mr. Puff N. Blow of the Polyp County Public School System. He is an assistant superintendent and is concerned about the lagging community support for the school system in Polyp County.

The question has been posed to the computer in the form of a logic equation which requests those documents dealing with Community-School Relations and bond issues and tax support. As an added bonus, all documents dealing with Public Support are requested since there are only a few of these. Note that terms within groups are arranged so that the numbers of postings increase from the first term to the last in a group. (This has nothing to do with statement of the logic equation, but helps to reduce computer time required to process the search.)

Once the Research Analyst has prepared the search, it is transmitted to the COE at North Carolina State for further processing, and is returned

from there to the RIC. Search output is in two parts - the RIE and CIJE - as is the search input statement. Note that the RIE output is limited to ED number and 100 character title while the CIJE output contains ED number, title, author, a short bibliographic note, and the document source.

RIE documents are available from the microfiche file, but CIJE documents and articles may only be found in the journal cited. Certain of these are in the Center, but others must be obtained from other libraries or files.

STATEMENT OF RESEARCH QUESTION

Local Education Agencies and Satellite Centers

(1-5) Bibliography Number 0001
(6) Research Analyst DP
(7-9) Date Received Sept. 31, 1970

For Project Use Only

10-30) Name (Last name - Initials) Blow, Puff N. (31-36) Date Sept. 31, 197

37) Is this a restatement of a previous question? no (38) Number -

39-40) Administrative Unit Polyp County Public School System

41) This information will be chiefly used in which of the following functions?

(1) Project or proposal research

(2) Thesis or dissertation research

(3) To assist in literature review for a course I am taking

(4) General or personal information

(5) Need for instructional materials

(6) Demonstration of the system

(7) Administrative or managerial assistanc

(8) Other (please specify)_____

42) The information will be chiefly used in which of the following positions or occupations

(1) Superintendent

(2) Assistant Superintendent

(3) Supervisors

(4) Project Director

(5) Principal

(6) Counselor

(7) Teacher

(8) School Board

(9) Other Please specify)_____

(45) An acceptable response time would be:

(1) one day

(2) 2 - 3 days

(3) one week

(4) 2 - 3 weeks

(5) 4 - 6 weeks

(6) Other (please specify) _____

(46) Which of the following files would you like the search to cover?

(1) ERIC Research in Education (RIE) Computerized

(2) ERIC Current Index to Journals in Education (CIJE) Computerized

(3) Both RIE and CIJE Computerized

*(4) Manual search of non-ERIC files

*(5) Comprehensive search of ERIC and non-ERIC files

(47) Which of the following outputs would you like to receive?

(1) Accession number and a one-hundred character title Computerized

(2) Complete abstracts Computerized

*(3) Research analyst selected abstracts

*(4) One to two-hundred word summary

*(5) Research analyst selected microfiche

*(6) All microfiche

*(7) Annotated bibliography

*(8) Five to fifty page summary

*(9) Other (please specify)_____

(48) The number of persons who will be directly affected (teachers, pupils, staff) by this information.

(1) My own personal information

(2) Less than 10

(3) 11 - 35

(4) 36 - 200

(5) 201 - 500

(6) 501 - 2000

(7) 2001 - 10,000

(8) 10,001 - 50,000

(9) Over 50,000

*The availability of these services is dependent upon staff workload

Problem Statement. Be as specific as possible. If an ERIC thesaurus of descriptors is available, it should be of assistance in wording your problem. Best results are obtained by not being too specific in areas where little has been written and being rather specific in areas where a lot has been written. Give as much information as possible.

List of documents which show questionnaire, and describe active programs and methods used by public school systems to gain community support.

:t one of two

SEARCH STRATEGY

:CH TITLE Blow, P.N. - Community Support
LAST NAME, INITIALS - DESCRIPTIVE TITLE

. YOU PICK UP YOUR SEARCH no PHONE
.ING ADDRESS

. SEARCH TO Polyp County Public School System

YOU USE THE ERIC THESAURUS? X STRC DICT.? X

.SE RUN ON: RIE FILE X, CIJE FILE ____, BOTH ____
.SE SEND ME: TITLES ____, ED NUMBERS ONLY ____,
ABSTRACTS ____.

Bibliography Number OOOP1
Research Analyst
Time & Date Received 0861, Sept. 31, 1970

Initialized	Action	Time	Total Time
Research Analyst	Interview	0.5	
	Forms Comp.	0.7	
	Transportation	0.2	
Programmer	Key Punch	0.7	
	Transportation	0.5	

Total Number of Postings 3593
Total Number of Terms 20
Total Number of Groups 3
Total Number of Intersections 1
Estimated Number of Hits (100) 2
Time to Run
Total Number of Hits
Batch Num r 1
Number of Questions in Batch 1

FOR PROJECT USE ONLY

OGIC CODE	DESCRIPTOR TERM	NUMBER OF POSTINGS
A	Public Support	32
B	Community Support	63
C	Community Relations	69
D	Parent School Relationship	112
E	Public Relations	148
F	Community Involvement	268
G	School Community Relationship	354
H	Local Issues	14
I	School Budget Elections	17
J	Racially Balanced Schools	25
K	Bond Issues	29
L	Tax Support	43
M	Community Education	50

LOGIC EQUATION:

123 9/28/70

t 2 of 2

SEARCH STRATEGY

CH TITLE _____
LAST NAME, INITIALS - DESCRIPTIVE TITLE

, YOU PICK UP YOUR SEARCH _____ PHONE _____
ING ADDRESS _____

_____

, SEARCH TO _____

_____

_____

YOU USE THE ERIC THESAURUS? ____ STRC DICT.? ____

SE RUN ON: RIE FILE ____, CIJE FILE ____, BOTH ____
SE SEND ME: TITLES ____, ED NUMBERS ONLY ____,
ABSTRACTS ____.

Bibliography Number _____
Research Analyst _____
Time & Date Received _____

Initialized	Action	Time	Total Time
Research Analyst	Interview		
	Forms Comp.		
	Transportation		
Programmer	Key Punch		
	Transportation		

Total Number of Postings _____
Total Number of Terms _____
Total Number of Groups _____
Total Number of Intersections _____
Estimated Number of Hits (100) _____
Time to Run _____
Total Number of Hits _____
Batch Number _____
Number of Questions in Batch _____

FOR PROJECT USE ONLY

OGIC CODE	DESCRIPTOR TERM	NUMBER OF POSTINGS
N	Community Surveys	70
O	Racial Attitudes	75
P	Community Attitudes	129
Q	Parent Attitudes	241
R	Innovation	252
S	Changing Attitudes	312
T	Questionnaires	1290
		3593

OGIC EQUATION: (A+B+C+D+E+F+G) · (H+I+J+K+L+M+N+O+P+Q+R+S+T) + A

9/28/70

t 1 of 2

SEARCH STRATEGY

JOB TITLE _____
LAST NAME, INITIALS - DESCRIPTIVE TITLE

YOU PICK UP YOUR SEARCH _____ PHONE _____
ING ADDRESS _____

SEARCH TO _____

YOU USE THE ERIC THESAURUS? ____ STRC DICT.?____

SE RUN ON: RIE FILE____, CIJE FILE X, BOTH____
SE SEND ME: TITLES____, ED NUMBERS ONLY ____,
ABSTRACTS X.

Bibliography Number 00OP1
Research Analyst _____
Time & Date Received 0830, Sept. 31, 1970

Initialized	Action	Time	Total Time
Research Analyst	Interview		
	Forms Comp.		
	Transportation		
Programmer	Key Punch		
	Transportation		

Total Number of Postings 1113
Total Number of Terms 21
Total Number of Groups 3
Total Number of Intersections 1
Estimated Number of Hits (100) 1
Time to Run _____
Total Number of Hits _____
Batch Number 1
Number of Questions in Batch 1

FOR PROJECT USE ONLY

OGIC CODE	DESCRIPTOR TERM	NUMBER OF POSTINGS
A	Community Support	10
B	Community Relations	13
C	Public Support	22
D	Public Relations	51
E	Parent School Relationship	57
F	Community Involvement	122
G	School Community Relationship	131
H	Racially Balanced Schools	3
I	School Budget Elections	5
J	Local Issues	6
K	Community Education	10
L	Community Surveys	12
M	Bond Issues	17

OGIC EQUATION: _____

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:t 2 of 2

SEARCH STRATEGY

RCH TITLE _____
LAST NAME, INITIALS - DESCRIPTIVE TITLE

L YOU PICK UP YOUR SEARCH _____ PHONE _____
LING ADDRESS _____

L SEARCH TO _____

YOU USE THE ERIC THESAURUS? ____ STRC DICT.? ____

ASE RUN ON: RIE FILE ____, CIJE FILE ____, BOTH ____
ASE SEND ME: TITLES ____, ED NUMBERS ONLY ____,
ABSTRACTS ____.

Bibliography Number _____
Research Analyst _____
Time & Date Received _____

Initialized	Action	Time	Total Time
Research Analyst	Interview		
	Forms Comp.		
	Transportation		
Programmer	Key Punch		
	Transportation		

Total Number of Postings _____
Total Number of Terms _____
Total Number of Groups _____
Total Number of Intersections _____
Estimated Number of Hits (100) _____
Time to Run _____
Total Number of Hits _____
Batch Number _____
Number of Questions in Batch _____

FOR PROJECT USE ONLY

OGIC CODE	DESCRIPTOR TERM	NUMBER OF POSTINGS
N	Community Attitudes	23
O	Tax Support	24
P	Racial Integregation	46
Q	Racial Attitudes	49
R	Innovation	57
S	Parent Attitudes	100
T	Questionnaires	173
U	Changing Attitudes	182
		1113

LOGIC EQUATION: _____

9/28/70

STRC -- IVS

BLOW, P.N. COMMUNITY SUPPORT

SEARCH NUMBER 000201

COMPANY CODE ORU

PREPARED BY

CHILDERS

9/31/70

QUESTION 1 CONTAINS 22 TERMS AND 3 GROUPS

TOTAL NUMBER OF POSTINGS FOR THIS QUESTION = 3593

GROUP 1 CONTAINS 7 TERMS

COMMUNITY SUPPORT	OR	3	COMMUNITY RELATIONS	OR	3
PUBLIC SUPPORT	OR	3	PUBLIC RELATIONS	OR	3
PARENT SCHOOL RELATIONSHIP	OR	3	COMMUNITY INVOLVEMENT	OR	3
SCHOOL COMMUNITY RELATIONSHIP	AND	3			

* * * AND * * * *

GROUP 2 CONTAINS 13 TERMS

LOCAL ISSUES	OR	3	SCHOOL BUDGET ELECTIONS	OR	3
RACIALLY BALANCED SCHOOLS	OR	3	BOND ISSUES	OR	3
TAX SUPPORT	OR	3	COMMUNITY EDUCATION	OR	3
COMMUNITY SURVEYS	OR	3	RACIAL ATTITUDES	OR	3
COMMUNITY ATTITUDES	OR	3	PARENT ATTITUDES	OR	3
INNOVATION	OR	3	CHANGING ATTITUDES	OR	3
QUESTIONNAIRES	OR	3			

* * * OR * * *

GROUP 3 CONTAINS 1 TERMS

COMMUNITY SUPPORT 3

* * * * * *

EJCCCC15
AASCCC28
69 FEB
ONE SUPERINTENDENT'S ANSWER TO A CITY'S EDUCATION PROBLEMS
EAIR, MEDILL
GRADE TEACHER; 86; 6; 274-279

EJCCCC42
AASCC776
69 JAN
LEARNING THE ART OF CONFRONTATION
UNRLF, ADOLPH
PEABODY J EDUC; 46; 4; 235-237

EJCCC165
FESCCC11
69 W
ADBODY'S HERO: A PRESIDENT TALKS TO HIS FACULTY
BABBIDGE, HOMER D., JR.
REMARKS MADE AT THE FACULTY CONVOCATION OF THE UNIVERSITY OF CONNECTICUT, OCTOBER 24, 1968.
EDUC REC; 50; 1; 32-36

EJCCC765
AASCC797
69 JAN
A TIME FOR BOLDNESS-EAST SAN JOSE SAYS "YES?" TO EDUCATIONAL PARK CONCEPT
JENSEN, HENRY C.
J SECONDARY EDUC; 44; 1; 31-35

EJCC1360
EMSCCC32
69 FEB
A COMPREHENSIVE MATHEMATICS PROGRAM.
ERCLSSARD, VERNON;AND OTHERS
AUDIOVISUAL INSTR; 14; 2; 43-4,46

EJCC1651
AASCC472
69 FEB
THE STRUGGLE FOR POWER IN THE PUBLIC SCHOOLS.
MEYER, AGNES E;AND OTHERS
EXCERPTS FROM THE PROCEEDINGS OF THE ANNUAL CONFERENCE OF THE NATIONAL COMMITTEE FOR SUPPORT OF PUBLIC SCHOOL (6TH, MARCH 1968), PATRICIA WAGNER EDITOR
TEACHERS COLL REC; 70; 5; 387-393

JCC1679
ASCCC27

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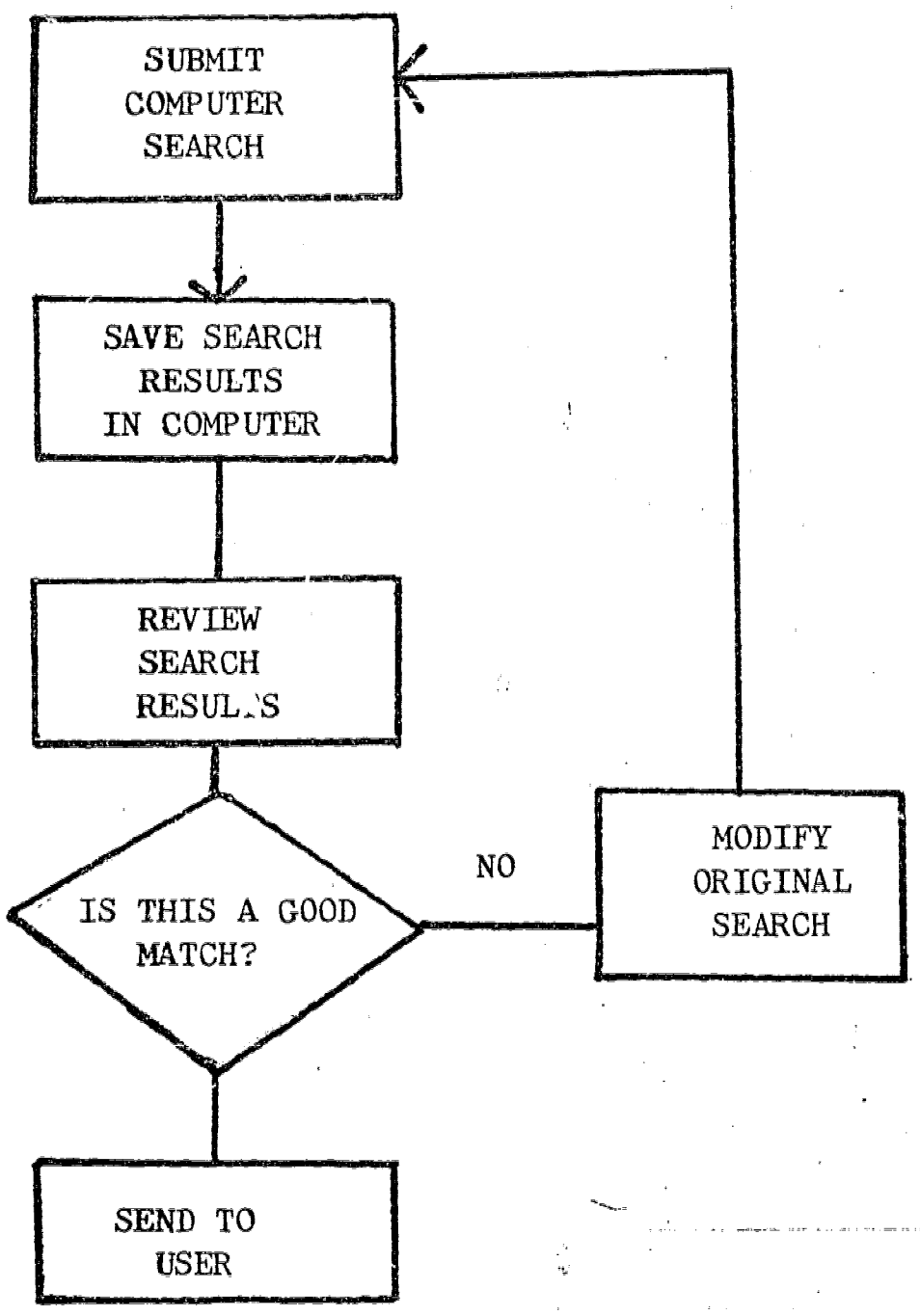
V. Evaluation of the Retrieval Function

A. Review of Search Output

As we have tried to emphasize, the computerized retrieval system is a tool, an aid, to assist the Research Analyst in the search for documents and materials which are relevant to the user's question. It is an imperfect tool, and cannot be considered to be infallible - remember that all documents have been entered into the system based upon qualitative judgement made by the indexers. Furthermore it is very difficult to present the retrieval problem to the computer <u>exactly</u> as posed by the user. Although the use of Boolean logic in statement of the question permits considerable flexibility and specificity, there is no capability in terms of syntax. For example, the intersection of terms BLIND and VENETIAN could retrieve documents referenced under either Blind Venetians or Venetian Blinds - two different topics altogether. Not all of the documents retrieved from a search can be considered to be relevant to the user's question, and we must review the search output to make sure first of all that the question as posed does in fact relate the user's question to the machine. Remember that the problem is to state the user's question in those terms used by the indexer to put the document into the system. This may take some study of the problem before writing a computer search, and most certainly will require work after the <u>first</u> search run has come back from the computer. On some accasion, it may be necessary to re-submit a search to the computer to get the corrent documents. The system is designed to help you do this simply. Let's assume that a computer search has been submitted and the list of documents received is on the order of 500 long. This is obviously a

poorly executed search, because the computer system is supposed to provide a list of reasonable length of relevant documents. What should the Research Analyst do then? The following chart will help.



The first block needs no explanation - this is the first step in the computer-search process. The "Save-Search" process is not complicated since we normally "save" ERIC searches (ED numbers) and use them to retrieve titles and bibliographic data. But there is an additional feature which should be emphasized and that is that the saved results can be used exactly as if they were the ED numbers listed under an authorized term in the STRC dictionary.

In the case of the 500-hit search, we would use the results of this first search as input into the next search. This would enable us to use the first results profitably and prevent our having to re-run the first long search all over again.

This can be shown another way. Assume that the first search logic was a string of logical unions:

First Logic: (A + B + C + D + E + F + G + H + I + J + K + L)

Let's call the output answer string of ED numbers search term F. Then, we can run a second search simply by using this term -

Second Search Logic: (F) · M

This procedure can be continued indefinitely. However, a limitation exists in that only 900 hits can be saved from any single search.

B. Review of Abstracts and Literature

The steps involved in the evaluation of search output are essentially these:

(1) Review of search output - ED numbers. Is this too many; too few?

(2) Do the titles and citation data indicate that the search question was properly stated?

(3) Review abstracts and resumes for those titles which appear to be most relevant

(4) Send abstracts and, if review of abstracts indicate a high level of relevancy, microfiche or hard copy.

This process is not necessarily sacred. It should be considered as a guide simply from the point of view that this is a logic procedure and an orderly way to approach the problem.

Appendix A

Handy Hints for Research Analysts

or

What to do when Everything Goes Wrong

There are any number of tricks of the trade for setting up searches. Most of these are specifically related to the Research and Information Center, but many are more or less general in nature.

For instance, the RIC maintains a "Vertical Subject File" which contains very good information on any number of subjects which can be used to provide the Research Analyst with a reasonable background to help her in writing a search. It's a good rule of thumb to say that time will be saved in preparation of a search if one will look in this Vertical File before starting to write up the search.

Another good approach is to use the EIJ and CIJE published abstracts before starting a search. Abstracts have been printed under specific subject categories which are given by the most significant (starred) descriptors. A search can be started by finding a few relevant abstracts in the published journals and then reading the descriptors and keyterms under which that abstract has been indexed.

If these approaches have been tried and if there still isn't enough information to permit a search to be written, call someone. There are consultants and specialists of every kind (relevant to education) within the State Department. These people constitute an "information resource on the hoof" and should be used when necessary.

Sometimes it's difficult to start a search or to get relevant documents because the problem has not been stated properly or adequately. When this is the case, call the person who requested the search and talk the problem over with him. This might help him to further clarify his problem and give you a better starting point.

Now a few words concerning search writing:

(1) The greater the number of relevant terms which can be used in union, the greater the number of search hits.

(2) The maximum number of hits in a union is the sum of postings of the union.

(3) The number of documents retrieved by a search decreases as the number of intersections increases. For instance:

A + B + C + D	Many hits
(A + B + C + D) · G	Not so many hits
A · B · C	Very few, if any hits
A · B · C · D	Hardly any at all

(4) Negations are generally fruitless unless you can be reasonably assured of remaining a significant number of documents from the hit list. It's usually better to intersect the results with a more specific term.

(5) As the Research Analyst gains experience, he is able to write a good search using a relatively small number of searches. An unexperienced search writer should not hesitate to use as many terms as he feels is necessary.

(6) Search writing is not an exact science - it is an art. Search writing can be learned in a reasonable length of time. However, to most people, search writing is a new thing, and some time is required before she becomes skillful at the job.

(7) Don't be afraid to ask questions. A mistake isn't all that drastic.

(8) The system won't support logic statements with imbedded parenthesis like:

$$(((A + B) \cdot C) \cdot (E + ((F + G) \cdot H))) \cdot (I + J)$$

It's a good thing, because statements like this are hard to set up correctly, and usually aren't worth the trouble.

(9) Another very good resource material to be used in getting a search started is the Leasco publication ERIC Descriptors - Term Usage Postings and Term Usage Statistics. This is a published inverted file which lists document ED numbers which have been indexed under authorized descriptors. In addition to the ED number listings, these are tables on numbers of documents indexed under descriptor terms.

(10) The following is a list of questions and suggestions which will be a help to you in working with system users.

INTERVIEW SUGGESTIONS

1. Obtain a brief description of the search topic. (During this description listen for key technical terms)

2. What are the important technical subject terms (key words) related to this topic? or If you were looking in the subject card catalogue what terms would you look under?

3. Is there a special part of this subject that is of particular interest? At this point a preliminary judgment must be made -- i.e.
-- this subject is too broad --
-- this subject is too narrow --
-- this subject appears proper for a search --
If you cannot make a judgment, an alternative is to ask all the questions below.

   A. If subject is too broad:
      1. Is there a specific part of this subject which is of special interest to you?
      2. Is there a particular technical process or reaction in this area which is of special interest?
      3. Can you be more specific?

   B. If subject is too narrow:
      1. Can this technique or process be expressed in a more general way?
      2. Are there any areas where you know this has been applied or that relate to this subject?
      3. Are you interested in this topic or part of a more general subject?

4. Provided a suitable topic is chosen you proceed to look up one of the key terms. List that term if it is in the thesaurus. Look at broader terms, narrow terms and related terms or let the user look at them and see if these other terms bring any response.

5. Proceed with this process until all terms which cause response by the user are exhausted or until you feel a sufficient number of terms are available to you. If you have lots of terms try to have the user chose the most pertinent ones.

6. Are there any of these terms which very specifically apply to exactly what you are interested in? (if there are -- note these)

7. Propose a logic statement. (i.e. let's take all of the postings under this and this and let's cross this group with this group)
NOTE -- If a particular term was chosen under 5 above try to use this as a complete term unless it has two many postings.

8. User will ordinarily help organize logic once a proposal has been made.

9. Ask the user if search seems logical to him.

10. Look up the postings for each term here. Logic may need to be revised based on the number of postings and the generality of the searchers interest.

Information Sources

Listed below are six services which may serve as sources of information relevant to problems faced by educators. A letter to any of them will result in some reply which may or may not be helpful. Merely state the problem for which information is needed, being as precise as possible.

1. ERIC (Educational Resources Information Center)

ERIC Clearinghouses are a network of information or documentation centers for a national information system designed to serve educationa by making available reliable, current educational research and research-related materials. Each of the clearinghouses focuses on a specific field of education.

The addresses of all the ERIC Clearinghouses are listed below. The change agent and his clients may seek assistance through their local clearinghouse, or through one whose area of special interest coincides with the particular problem area of the client system.

KEYS TO ERIC: THE CLEARINGHOUSES

ADULT EDUCATION Syracuse University 107 Roney Lane Syracuse, N.Y. 13210	The Clearinghouse is responsible for documents on formal and informal adult and continuing education in all settings.
COUNSELING AND PERSONNEL SERVICES 611 Church Street Ann Arbor, Michigan 48114	The Clearinghouse is responsible for documents in the area of educating and supervising counselors and other personnel workers at all educational levels and in all settings.
DISADVANTAGED Teachers College Columbia University New York, N. Y. 10027	The Clearinghouse is responsible for documents on the educational, psychological, social, and general development of urban children and youth who are socially, economically, or culturally disadvantaged.
EARLY CHILDHOOD EDUCATION University of Illinois 805 West Pennsylvania Avenue Urbana, Illinois 61801	The Claringhouse is responsible for documents on the physiological, psychological, social, and cultural development of children from birth through primary grades.
EDUCATION ADMINISTRATION University of Oregon Eugene, Oregon 97403	The Claringhouse is responsible for documents dealing with the organization, leadership, and administration of educational programs and organizations, and with the preparation of educational administrators.

EDUCATIONAL FACILITIES

This Clearinghouse has been terminated. It has been incorporated into the ERIC Clearinghouse on Educational Administration.

EDUCATIONAL MEDIA AND TECHNOLOGY
Institute for Communication Research
Stanford University
Stanford, California 94305

The Clearinghouse is responsible for documents on the instructional uses of educational equipment, materials, and nonprinted resources for programmed instruction, instruction through audiovisual media, and instruction through broadcast media.

EXCEPTIONAL CHILDREN
National Education Association
1201 16th Street, N.W.
Washington, D. C. 20036

The Clearinghouse is responsible for documents on educating children and youth who require special services - those who are gifted, mentally retarded, visually impaired, deaf, hard of hearing, physically handicapped, emotionally disturbed, or speech-and-language-impaired.

HIGHER EDUCATION
George Washington University
Washington, D. C. 20006

The Clearinghouse is responsible for documents on higher education, including graduate and professional education.

JUNIOR COLLEGES
University of California at
Los Angeles
405 Hilgard Avenue
Los Angeles, California 90024

The Clearinghouse is responsible for documents about public and private community and junior colleges, including studies on students, staff, curricula, programs, libraries, and community services.

LIBRARY AND INFORMATION SCIENCES
American Society for Information Science
1140 Connecticut Avenue, N.W.
Suite 804
Washington, D. C. 20036

The Clearinghouse is responsible for documents on the operation of libraries and information centers, the technology used to improve their operations, and the education and training of library and information specialists.

LINGUISTICS
Center for Applied Linguistics
1717 Massachusetts Avenue, N.W.
Washington, D. C. 20036

The Clearinghouse is responsible for documents on linguistics and related language sciences, and languages not commonly taught in the United States; that is, all except French, Italian, German, Spanish, Russian, Latin, and classical Greek.

READING
Indiana University
204 Pine Hall
Bloomington, Indiana 47401

The Clearinghouse is responsible for documents on all aspects of reading behavior, with emphasis on the physiology, psychology, sociology, and teaching of reading.

RURAL EDUCATION AND SMALL SCHOOLS
New Mexico State University
Box 3AP, University Park Branch
Las Cruces, New Mexico 88001

The Clearinghouse is responsible for documents on organization, administration, curriculum, instruction, innovative programs, and other aspects of small schools and rural education in general, as well as outdoor education, Migrant Education, Indian Education, and Mexican-American Education.

SCIENCE AND MATHEMATICS EDUCATION
Ohio State University
1460 West Lane Avenue
Columbus, Ohio 43221

The Clearinghouse is responsible for documents on all levels of science and mathematics education, and on adult and continuing education in science and mathematics.

SOCIAL SCIENCE EDUCATION
University of Colorado
Boulder, Colorado 80302

This Clearinghouse has only been recently established. It is responsible for documents on all levels of social science education.

TEACHER EDUCATION
1156 15 th Street, N.W.
Washington, D. C. 20005

The Clearinghouse is responsible for documents on the preparation of school personnel, nursery school, elementary, and secondary, as well as the preparation and development of teacher, recruitment, selection, life-long personal and professional development and teacher placement.

TEACHING OF ENGLISH
National Council of Teachers of English
508 South Sixth Street
Campaign, Illinois 61820

The Clearinghouse is responsible for documents on teaching of skills and content of English, and on the methodology of teaching English at all instructional levels.

TEACHING OF FOREIGN LANGUAGES
Modern Language Association of America
62 Fifth Avenue
New York, N.Y. 10011

The Clearinghouse is responsible for documents on teaching French, German, Italian, Russian, Spanish, Latin, and classical Greek.

TESTS, MEASUREMENT, AND EVALUATION
Educational Testing Service
Princeton, New Jersey 08540

This Clearinghouse has only been recently established.

VOCATIONAL AND TECHNICAL EDUCATION
Ohio State University
980 Kinnear Road
Columbus, Ohio 43212

The Clearinghouse is responsible for documents in the general field of vocational and technical education, which includes many specific sub-fields such as agricultural education and trade and industrial education.

2. EPIE (Educational Products Information Exchange)

EPIE is a non-profit professional cooperative that conducts impartial studies of educational products. Each monthly newsletter, the EPIE Product Report, reviews a single educational "product" (e.g., black and white TV receivers, secondary social studies materials, school guidance programs). Subscription to this publication, something on the order of a Consumers Report is quite expensive; but copies of relevance to a particular innovation under consideration might be located through ERIC. Subscription information may be obtained by writing:

EPIE Institute
386 Park Avenue, South
New York, New York 10016

3. RIS (Regional Information System)

RIS is a model for a regional information linkage system. It is intended to be a 'one-stop' tool providing current awarenesses and reference services for all of the Michigan-Ohio Regional Educational Lab projects. MOREL, which for the present time is not being funded, was originally set up to determine the regional needs as expressed by local public school educators, college and university personnel, state departments of education, research organizations and people from the business community, and to service such needs. RIS is now taking over these functions and is also extending them. Printed materials are made available through its Referral Library which contains indices, directories, bibliographies, documents, abstracts, materials on specialized information systems and current periodicals and publications of the Research and Development Centers and the Regional Educational Laboratories. The Resource Bank, an added feature of this system, provides information about people and programs in different areas of education. RIS is in operation in three locations and under three different names:

(1) MOREL's Information Center
3750 Woodward Avenue
Detroit, Michigan 48201

(2) Association Referral Information Services (ARIS)
is part of the Ohio Education Association
225 East Borad Street
Columbus, Ohio 43215

(3) Activities to Support and Stimulate Innovation'
in Schools Today (ASSIST)
Director, Dr. S. Mangione
Wayne County Intermediate School District Assist Center
33030 Van Buren Road
Wayne, Michigan 48184

4. SRIS (School Research Information Service)

SRIS is an information service sponsored by Phi Delta Kappa to serve its members and any other interested educators or educational institutions. Its primary aim is to diffuse information developed by schools themselves in their own research and innovative projects. Through the volunteer efforts of members of Phi Delta Kappa, SRIS retrieves research reports and descriptions of innovative activities from school systems and school study councils. These are indexed and abstracted using ERIC procedures, and are available on microfiche (25/fiche) or regular size (10¢/page + postage). WRIS cooperates with ERIC to minimize duplication of efforts, and it will include with the material sent in response to requests, a list of relevant ERIC material.

School Research Information Service
Phi Delta Kappa Research Service Center
Eighth and Union Streets
Bloomington, Indiana 47401

Director: Dr. William J. Gephart

5. National Referral Center for Science and Technology

The National Referral Center for Science and Technology may be described most simply as the "information desk" of the scientific and technical community. Operating in the Library of Congress with the support of the National Science Foundation, the Center is designed to provide a single place to which anyone with an interest in science and technology may turn for advice on where and how to obtain information on specific topics.

The Center does not provide technical details in answer to inquires, nor does it furnish bibliographic assistance. Functioning as an intermediary, it directs those who have a question concerning a particular subject to organizations or individuals with specialized knowledge of that subject.

The Center is concerned with all fields of science and technology; the physical, biological, social, and engineering sciences, and the many technical areas relating to them. Similarly, it is concerned with all kinds of information resources, wherever they may exist: in government, in industry, and in the academic and professional world.

Referral services is available without charge to any organization or individual working in any field of the physical, biological, social, and engineering sciences. No special forms are required, but the following information will enable the Center to make its replies more effective:

Precise Statement of the Information Desired.
A request submitted in clear, precise terms will make it possible to select the most specifically pertinent resources. Referral service is speeded up if each request is limited to a single topic.

Statement of Information Resources Already Contacted.
To avoid being referred to resources already known to him, the inquirer should tell the Center what resources he is already familiar with.

Statement of Special Qualifications.
Participation in a government contract, affiliation with a recognized research project, or membership in a professional society sometimes entitles an inquirer to use resources otherwise not open to him. Any such qualifications should be indicated.

Referral requests may be made by calling area code 202, 967-8365, by writing to the Library of Congress, National Referral Center for Science and Technology, Washington, D. C., 20540, or by visiting the Center on the fifth floor of the Library of Congress Annex, Second Street and Independence Avenue SE.

6. State Research Coordinating Units

Most of the states have Research Coordinating Units (RCU) serving vocational-technical education. The RCU often serves as a most helpful source of information. The location of the RCU is your state can be obtained from a VO-tech State Supervisor or Teacher Educator.

North Carolina Science and Technology Research Center

RESEARCH TRIANGLE PARK, N. C. 27709

P. O. Box 12235

Telephone: (919) 549-8291
TWX Number: 510-927-1804

CURRENT INFORMATION RESOURCES - NOVEMBER 1, 1970

THE NASA INFORMATION FILE (NASA), dating from 1962, contains about 450,000 documents, and grows at a rate of approximately 70,000 per year. It is composed of only 16% NASA-generated reports, the balance being reports, published and unpublished, collected from world-wide sources deemed pertinent to any phase of the aerospace program. Two journals abstract these varied articles and are published semi-monthly - International Aerospace Abstracts (IAA) and Scientific and Technical Aerospace Reports (STAR). Services available: RS, CA (see note, bottom of page)

THE DEPARTMENT OF DEFENSE FILE dates from mid-1964 to the present, and contains approximately 104,000 unclassified documents collected by the Defense Documentation Center (DDC). Beginning in October 1970, file coverage was broadened to include all reports abstracted in U.S. Government Research and Development Reports (USGRDR). This adds reports from all federal agencies and increases the monthly volume by approximately 30 per cent. Services Available: RS, CA

THE INSTITUTE OF TEXTILE TECHNOLOGY FILE (ITT) contains approximately 50,000 documents from 1966 to the present. Articles are abstracted in Textile Technology Digest, which is published monthly with about 1,000 abstracts in each issue. About 70% of the coverage is journal literature; about 30% is patent coverage, both from world-wide sources. Services available: RS

ENGINEERING INDEX (EI), dating from January 1968 to the present, is a monthly review of over 3,500 technical journals published both in the United States and abroad. The plastics and electrical/electronics sections of the index cover approximately 350 journals with over 6,000 plastics abstracts and 12,000 electrical/electronics abstracts annually. Services were expanded January 1970 to contain all accessions abstracted in the Engineering Index Monthly. Services available: RS, CA, SIP.

Types of Service Provided:
RS - retrospective searches
CA - current awareness (regular searches on a client-specified topic).
SIP - standard interest profiles (regular searches on a general topic).

CHEMICAL ABSTRACTS CONDENSATES (CAC) is prepared by the American Chemical Society. The Condensates tapes include the complete contents of Chemical Abstracts covering approximately 13,000 journals, plus extensive patent coverage. Since alternate issues cover different areas of chemistry, searches can be made of odd- or even-numbered issues, or of all issues. There are now approximately 250,00 abstracts appearing in Chemical Abstracts annually. Services available: CA

CHEMICAL TITLES (CT), a biweekly journal, reports the titles of selected papers recently published in 650 current chemical journals. Chemical Titles, in computer-readable form, is a biweekly service that provides the following searchable data from the corresponding issue of CT: titles of articles, names of authors, and bibliographic citations. There are approximately 5,000 titles appearing in each issue of CT. Services available: CA

BIOLOGICAL ABSTRACTS (BA) is a consolidation of biological information obtained by reviewing 7,400 life science journals from world wide sources. A computer-indexed portion of the file dates from September 1959 and contains some 1,250,000 references to abstracts. This may be searched by one or more of four indexes: B.A.S.I.C., which includes both keyword and subject indexes; an index by Author; and a Biosystematic (taxonomic classification) index. Eventually the file will go back to 1917, the beginning of Biological Abstracts. Services available: RS, CA

THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY TEXTILE INFORMATION SYSTEM (MIT), developed by Professor Stanley Backer, contains approximately 11,000 documents. The M.I.T. file covers the period 1950 through 1967, and is a closed file (i.e., no further additions will be made to this file). Abstracts have been selected from The Journal of the Society of Dyers and Colorists and The Journal of the Textile Institute, and include journal and patent citations. Services available: RS

THE AMERICAN SOCIETY FOR METALS (ASM) has constructed a computer file of the metals literature announced in Metals Abstracts. Bibliographic information may be obtained on citations related to specific questions as identified by keywords or index terms. The file contains approximately 125,000 published items from world-wide sources that have been announced since January, 1966. Services available: RS, CA

EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) file is a project of the Department of Health, Education and Welfare and contains about 50,000 citations from the journals Research in Education and Cumulative Index to Journals in Education since 1966. This file is updated semiannually. Most of the literature concerns research in the primary and secondary education fields. Services available: RS

Types of Service Provided:
- RS - retrospective searches
- CA - current awareness (regular searches on a client-specified topic).
- SIP - standard interest profiles (regular searches on a general topic).

MODEL DISSEMINATION CENTER

SATELLITE CENTER TRAINING MANUAL

prepared by

Dennis M. Phillips
Systems Consultant

Robert C. Evans, Jr.
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for

North Carolina Board of Public Instruction

Division of Research

MODEL DISSEMINATION CENTER

SATELLITE CENTER TRAINING MANUAL

I. DESCRIPTION OF THE MDC PROGRAM AND ITS ORGANIZATION

The Model Dissemination Center is a demonstration program funded through the U. S. Office of Education through the North Carolina State Department of Public Instruction, Division of Research. The objective of this program is to provide, on an experimental and limited basis, access to the vast amount of educational research materials available through the Educational Resources Information Center (ERIC) and other information available to the Research and Information Center (RIC) in the North Carolina State Department of Public Instruction. The Program makes available to local and state educational administrations these materials through the use of a sophisticated computer-based information retrieval system operated by the North Carolina Science and Technology Research Center at the Triangle Universities Computation Center in the Research Triangle Park. The Program has adopted a stance of problem solving: problems inherent in the operation of local and state education agencies from superintendent down to the teaching level receive individual attention and response from Program employees and the computer information system. Because the funding level is limited, the distribution of efforts by the project personnel and response to questions must, of course, be of a limited nature; however, response to any specific problem posed by a local or state education administration member will be to as complete an extent as is possible in order to present that person with the information and resources which he requires in order to solve the problem of immediate concern to him.

In the early stages of operation, the approach was for Dissemination Center personnel to visit and spend time in the offices of SEA and LEA personnel to discuss problems which they had encountered and for which a need for resource materials existed; and then to take the problem from that point using the computer to prepare bibliographies, lists of material, and names of personal contacts which might be of value to the user in the solution of the problem. The Model Dissemination Center does not take as its mission the solution of the problems posed by LEA and SEA personnel, but takes the position that if those people can be supplied with reference and resource materials, combined and packaged in an efficient and attractive manner, then the materials presented would be used as a means of solving problems in a more efficient manner than otherwise would have been the case. The basic operating mode then has been:

1. Visit LEA and SEA staff members, and talk with them concerning operational problems which have been encountered or which have been presented to them as a result of their normal activities.
2. Introduce LEA personnel to the Model Dissemination Center and thus the resources and capabilities available through the Program; and, therefore, to them through the computer-based information system and the reference materials available from the Research and Information Center.
3. Discuss with them the problems which they have encountered and to help them state these problems in terms which will be acceptable by the information system.

4. Process the question posed in accordance with organizational and management procedures developed for the operation of the Center.
5. Review these materials for applicability and relevance to the problem as posed by the LEA or SEA member.
6. Prepare and present a bibliography, list of abstracts, titles, resource materials, a list of personnel which can be of help in the solution of their problem.
7. Follow-up to insure that materials have been of value and to consider restatement of the original problem.

Although this personalized approach will yield certain definite results in the solution of administrative and technical problems, it is not the intent, of course, for the Model Dissemination Center to work in this mode for its duration. The objective is to create a climate in which LEA administrative, supervisory and teaching personnel will be inclined to contact Dissemination Center personnel within the North Carolina State Department upon their own initiative in an effort to seek research materials. The intent is that within each Satellite Center, of which there are five, there will be appointed one contact person to whom LEA personnel will be directed for the submittal of retrieval and research questions. Ideally, this contact person would be as well versed in the overall operation of dissemination efforts and programs as would be any of the personnel within the Dissemination Center itself headquartered in Raleigh. This person would

have the specialized training and experience necessary to perform the functions previously administered by the Dissemination Center. This would include all functions listed above; including specification of research problem, submittal of computer search question, review of search output, and acquisition of documents. The result of this ideal organization would be to provide the local Satellite Centers with the same degree of information retrieval expertise as exists in the Center headquarters. The practical attainment of this ideal is, however, not something which is to be expected immediately. Much work, study, and effort is necessary before this goal can be realized.

It is obvious that appointment of local personnel for these tasks is imperative if the dissemination effort is to be in any way cost effective. Clearly, Dissemination Center personnel cannot devote large amounts of their time to traveling and conferring with LEA members in order to solve problems related to that specific geographical area. This paper is directed to local Satellite Center appointees to give them a background in the organization of the Model Dissemination Center, the use of sophisticated computer-based retrieval systems, the resource materials available to them and to their personnel through the Center, and how they may effectively interface with the organization which has been established to support these information dissemination functions.

II. INTRODUCTION TO MDC INFORMATION SYSTEMS

The Model Dissemination Center draws upon the resources of two separate Federal agencies and three separate agencies of the State of North Carolina. The two Federal agencies are the U. S. Health, Education, and Welfare De-

partment, Office of Education, and the National Aeronautics and Space Administration. North Carolina State Government agencies are North Carolina Department of Public Instruction, Division of Research; North Carolina State University, Center for Occupational Education; and the North Carolina Science and Technology Research Center. The U. S. Department of Education through the Educational Resources Information Center (ERIC) helped provide funds for the operation of the Model Dissemination Center for a period of one year. These monies, as well as the project, are monitored and administered through the Division of Research of the State Department of Public Instruction. ERIC resource materials are available at the Research and Information Center, which is organizationally located within the Division of Research. The North Carolina State Occupational Center is responsible for preparation of retrieval questions and the North Carolina Science and Technology Center cooperates by making sophisticated information retrieval systems available to the project. This organization is shown in Figure 1.

Illustrative materials which describe the Research and Information Center and ERIC are shown in Figures 2, 3, and 4.

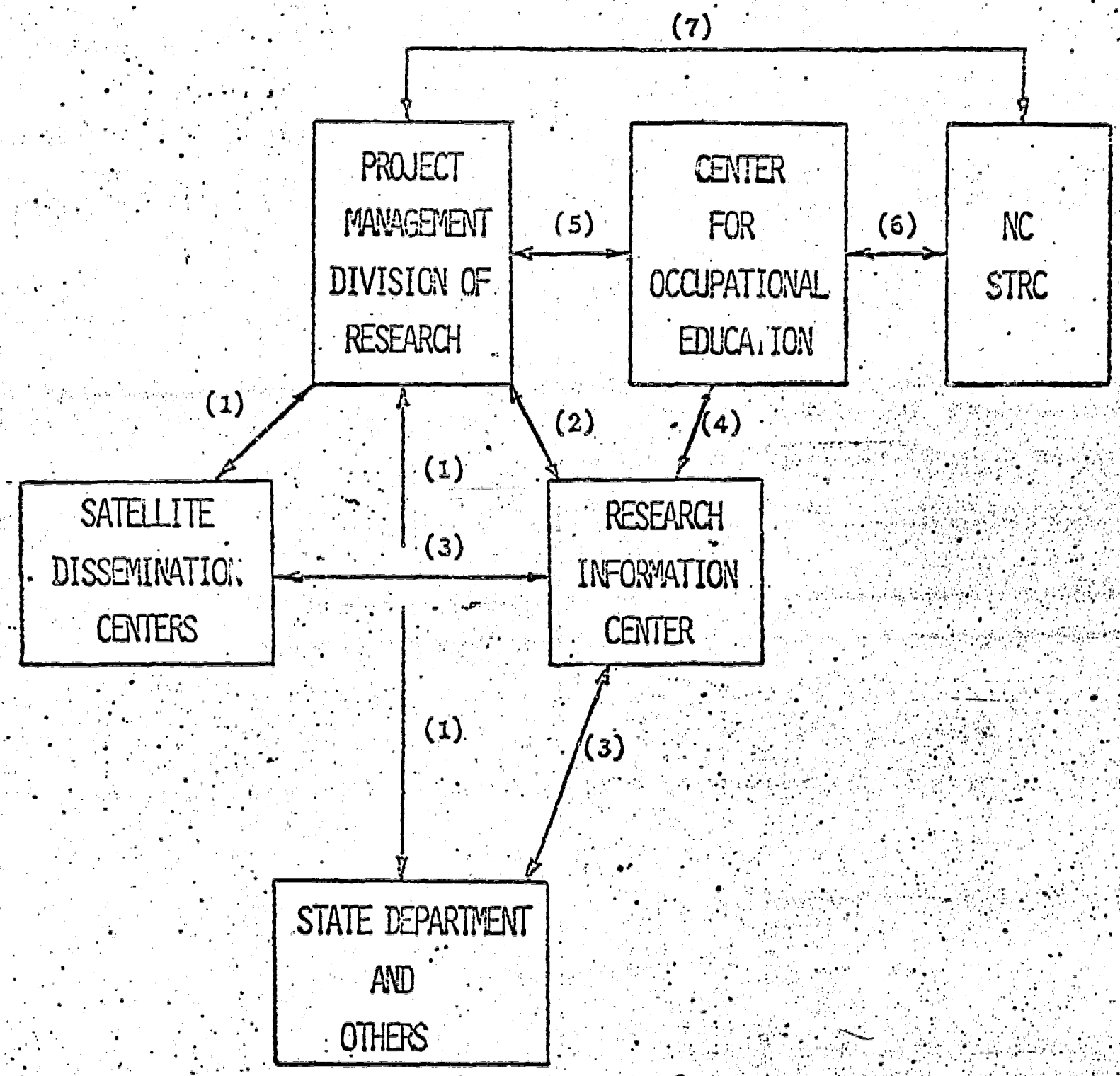

FIGURE 1

FUNCTION ORGANIZATION CHART - MODEL DISSEMINATION SYSTEM

Research & Information Center

State Department of Public Instruction / Raleigh, N. C.

Background . The Research & Information Center was created in 1960 with State funds as a supportive arm of the SEA and served SEA staff only. Later, federal funding (NDEA, Title III) made possible the expansion of the Center's facilities and its holdings. The advent of ESEA opened new vistas, and Title V funds were made available to implement the ERIC program on a limited basis, to purchase needed equipment, to add professional materials, and to secure an additional staff member.

Little publicity has been given the Research & Information Center; gradually, however, news of its services, facilities, and holdings has spread throughout the State and more and more educators are requesting use of its services and facilities. Users of the Center have become its best advertisement.

Facilities . Presently the Center's facilities, holdings, and services are used by approximately 400 educators monthly. Clients include staff members of the SEA, public school personnel, college and university faculties and students, and personnel from other State Agencies. The mailing list, formulated in terms of requests only, now totals 375 in- and out-of-State users of the dissemination activities generated by the Center.

Personnel . Total personnel of the Center now includes three full-time people and a part-time clerk. Facilities include areas for reading, studying, browsing, reference work, research, ERIC documents and hardware, and processing--a total of five average size rooms.

Collections . Collections maintained encompass a comprehensive store of research information and resources including:

- Back (microfilm) and current issues of 275 journals
- Selected dissertations on microfilm
- Basic education indexes and abstracts
- Standard references
- Collections of annotated bibliographies

FIGURE 2

- Complete ERIC dissemination on microfiche and all ERIC products
- Relevant pamphlets and government publications
- Subscriptions to news and research services
- Files on ERIC Clearinghouse activities
- Special files on North Carolina public schools
- Equipment for reproducing materials: copying machine for printed materials and a reader-printer for ERIC documents on microfiche and for microfilm

In addition, cooperative arrangements have been made with regional libraries and centers for supplementing the resources of the Research & Information Center.

Services - As an integral part of the State Education Agency, the Research & Information provides a wide variety of services:

- Leadership activities enabling SEA personnel and others to become aware of all materials in the extensive collections now available and to use these materials to greatest advantage within the Center itself.
- Leadership activities, varied in terms of user needs, in the broad area of education information dissemination. These activities include those requested and those initiated by the staff in anticipation of user needs.
- Leadership activities to keep personnel in the SEA and other educators continually aware of specific educational activities, completed and in progress, throughout the State and the nation. These activities place considerable emphasis on promising innovative practices.
- Execution of policies and processes which result in a centralized ordering and processing system; and a centralized storage, retrieval, and dissemination system for comprehensive materials collections.
- Evaluation of all incoming pamphlets, brochures, position papers, government publications, inter-state publications, and the like.

FIGURE 2 Continued

Techniques . Techniques employed in rendering these services include:

- People-to-people contacts within the Center--individual and small group--for purposes of orientation and information, with appropriate use of A-V aids, demonstrations, and discussions

- Face-to-face consultative services, to the degree possible, with personnel in public schools, colleges and universities, and educational organizations, relative to the administration and organization of the Center and the ERIC program in particular

- Preparation and distribution:

  EMPHASIS, a weekly subject listing of current magazine articles and pamphlets too new to be listed in the standard indexes

  ERIC INSTANT RESEARCH, an irregular annotated subject bibliography covering ERIC documents pertaining to topics of current interest in the SEA and elsewhere

  RECENT ACQUISITIONS, an irregular publication listing new and/or noteworthy books acquired by the Center

  ANNOTATED SUBJECT BIBLIOGRAPHIES, an irregular publication issued as a result of ERIC computer searches and comprehensive reviews of literature

  INFORMATION KITS, containing comprehensive information about the State, the SEA, the ERIC program, the Research & Information Center, and other useful information for new staff members

- Computer retrieval of information on specific subjects stored in the ERIC system

- Research on educational topics with preparation of precis

- Information dissemination by letter and telephone

Not only are these services recognized for their intrinsic individual worth, but in totality they tend to serve as a unifying force among personnel within the SEA in terms of purpose, relevance, and accountability.

STAFF: Mrs. Gladys Ingle, Director
Mrs. Barbara Crevar, Assistant to the Director
Mrs. Susan Wellborn, Research & Information Specialist
Miss Ruby Jones, Clerk

PHONE: 919-829-7904

FIGURE 2 Continued

RESEARCH & INFORMATION CENTER / STATE DEPARTMENT OF PUBLIC INSTRUCTION / RALEIGH, N. C. 27602

ERIC

INSTANT RESEARCH

EFFECTIVE UTILIZATION OF THE ERIC SYSTEM

WHAT IS ERIC?

The ERIC (Educational Resources Information Center) program is the brainchild of the United States Office of Education. Its purpose is to make the total educational community aware of what is taking place in education throughout the nation and to provide expedient access to reports, curriculums, and programs. ERIC uses microfiche, a 4" x 6" flat film microform, which can be quickly programmed and sequenced for individualized and specialized materials. ERIC's objectives are:

- To save space to house significant research collections.
- To save time in locating information.
- To save money in the cost of dissemination of information.

Composed of ERIC Central and twenty Clearinghouses, ERIC is the first nationwide comprehensive information system serving American education. All components of ERIC have one thing in common: they exist to bring you the educational information which you need.

RESEARCH IN EDUCATION

Research In Education (RIE), a computer prepared report on educational research and resources, is one of the tools necessary to use the ERIC system. A journal which announces new documents added to ERIC, RIE's monthly, semi-annual, and annual indexes are available from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402 for an annual subscription of $21.00. RIE combines the work of ERIC Central and the Clearinghouses into a journal featuring abstracts and indexes to abstracts. Information may be found by author, subject, and institution.

CURRENT INDEX TO JOURNALS IN EDUCATION

Current Index To Journals In Education (CIJE), the computer generated companion to RIE, contains a main entry section, author index, subject index, and index to source journals. Begun in April 1969, CIJE now lists approximately 500 journals along with indexing additional periodicals in related and peripheral fields of education. A monthly, semi-annual, and annual index subscription is available from CCM Information Corporation, 909 Third Avenue, New York, N. Y., 10022 for a fee of $34.00.

FIGURE 3

THESAURUS OF ERIC DESCRIPTORS

The Thesaurus of ERIC Descriptors, a standard vocabulary developed by subject experts in various disciplines of education, is used for searching subject indexes of RIE and other ERIC publications for retrieval purposes. The Thesaurus, which serves as an authority list and aid to bring the language of the documents and the language of the search request together, is available from the CCM Corporation for $8.50.

PORTABLE READERS

PMR/50, a lightweight 7 1/2 pound portable microfiche reader, is manufactured by DASA Corporation. PMR/50 has an 8 1/2" x 11" viewing screen and can be plugged into a regular electrical outlet (115V, AC). The focus is controlled by a single fingertip dial and the screen illumination by one on/off button. Distributed by 3M Company, the reader is available for $89.50.

Washington Scientific Industries, Inc. also manufactures a portable microfiche reader with a 9" x 12" viewer screen. Equipped with its own carrying case, the WSI sells for $199.00.

Another reader, the Mascot Microfiche Reader produced by Bell & Howell, sells for $190.00. Weighing 16 pounds, the Mascot has a tinted 11" x 11" screen for easy viewing and a sturdy carrying case.

SERVICES OFFERED BY THE RESEARCH & INFORMATION CENTER

The Research & Information Center (RIC) offers two unique services to educational practitioners: (1) computer generated bibliographies on educational topics and (2) reproduction of ERIC microfiche documents. In order to obtain a computer bibliography of ERIC documents or CIJE journal abstracts, the user should prepare a definitive statement of the problem and a list of key descriptors by using the ERIC Thesaurus. However, if the Thesaurus is not available, the user should provide his own list of relevant terms.

Microfiche reproductions of ERIC documents can be obtained from the RIC for the nominal charge of 10¢ per card. Requests for reproductions must specify the ED number of the document, as well as the number of copies desired.

CALL ON THE RIC — YOUR ONE-STOP INFORMATION CENTER!!

FOR FURTHER INFORMATION CONTACT:

Mrs. Gladys Ingle, Director
Research & Information Center
Raleigh, North Carolina
Telephone: (919) 829-7904
North Carolina State Department of Public Instruction

FIGURE 3 Continued

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

I am enclosing $ _____ (check or money order) for the following:

Name _____

Address _____

City _____ State _____ ZIP Code _____

FOR USE BY SUPT. OF DOCS.	

- ☐ *Research in Education Annual Index—1967 Reports, $3.25.*
- ☐ *Research in Education Annual Index—1967 Projects, $1.50.*
- ☐ *Research in Education Annual Index—January–December 1968 Reports, $8.25.*
- ☐ *Research in Education Annual Index—January–December 1969 Reports, $6.25.*
- ☐ *Thesaurus of ERIC Descriptors, Second Edition, April 1969, OE–12031–69, $3.25.*
- ☐ *Catalog of Selected Documents on the Disadvantaged: Subject Index, OE–37002, $3.*
- ☐ *Catalog of Selected Documents on the Disadvantaged: Number and Author Index, OE–37001, 65 cents.*
- ☐ *Pacesetters in Innovation, Fiscal Year 1967, OE–20103–67, $2.50.*
- ☐ *Pacesetters in Innovation, Fiscal Year 1968, OE–20103–68, $2.50.*
- ☐ *Pacesetters in Innovation, Fiscal Years 1966–1969, OE–20103–69, $5.00.*
- ☐ *Manpower Research, Inventory for Fiscal Years 1966 and 1967, OE–12036, $2.75.*
- ☐ *Manpower Research, Inventory for Fiscal Year 1968, OE–12036–68, $1.75.*
- ☐ *How to Use ERIC, OE–12037–A, 25 cents.*

ERIC *Clearinghouses*

Adult Education, Syracuse University, Syracuse, New York

Counseling and Personnel Services, University of Michigan, Ann Arbor, Michigan

Disadvantaged, Teachers College, Columbia University, New York, New York

Early Childhood Education, University of Illinois, Urbana, Illinois

Educational Administration, University of Oregon, Eugene, Oregon

Educational Facilities, University of Wisconsin, Madison, Wisconsin

Educational Media and Technology, Institute for Communication Research, Stanford University, Stanford, California

Exceptional Children, The Council for Exceptional Children, Arlington, Virginia

Junior Colleges, University of California at Los Angeles, Los Angeles, California

Higher Education, George Washington University, Washington, D.C.

Library and Information Sciences, American Society for Information Science, Washington, D.C.

Linguistics, Center for Applied Linguistics, Washington, D.C.

Reading, Indiana University, Bloomington, Indiana

Rural Education and Small Schools, New Mexico State University, Las Cruces, New Mexico

Science Education, Ohio State University, Columbus, Ohio

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

Teaching of English, National Council of Teachers of English, Champaign, Illinois

Teaching of Foreign Languages, Modern Language Association of America, New York, New York

Vocational and Technical Education, Ohio State University, Columbus, Ohio

GPO 889-695

ERIC *CAN HELP. . .*

School Administrators

Teachers

Researchers

Information Specialists

Professional Organizations

Students

School Administrators	identify significant programs for adapting to local needs plan and develop new programs based on the latest research
Teachers	keep informed on new instructional techniques and materials meet the demands of professional growth and development
Researchers	become aware of latest developments avoid duplication of research effort
Information Specialists	compile bibliographies on specific topics search for resources and answer inquiries
Professional Organizations	assist members in staying abreast of research in their areas of interest locate relevant resource materials for their information service activities
Students	prepare reports, term papers, theses, and dissertations acquire low-cost, individualized collections of materials

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ERIC . . . Educational Resources Information Center is a national information network for acquiring, abstracting, indexing, storing, retrieving, and disseminating the most significant and timely educational research reports and program descriptions.

RIC *publishes regularly*

RESEARCH IN EDUCATION. A monthly abstract journal announcing recently completed research or research-related reports and newly funded research projects—indexed by subject, author or investigator, and institution. Annual and Semiannual Indexes of all past monthly issues.

Thesaurus of ERIC Descriptors, Second Edition. Structured compilations of educational terms used to index and enter documents into the ERIC system.

Current Index to Journals in Education (CIJE), a monthly cataloging and indexing publication with annotations for journal and periodical literature in the field of education. Subscriptions to CIJE, Annual and Semiannual cumulative issues are available from:

CCM Information Corporation
(A subsidiary of Crowell Collier and MacMillan, Inc.)
909 Third Avenue
New York, New York 10022

Pacesetters in Innovation. Two volumes: Fiscal Year 1967, Fiscal Year 1968, and a cumulative edition for Fiscal Years 1966–69. Résumés of projects to advance creativity in education, indexed by subject, local education agency, and project number.

Manpower Research, Inventory for Fiscal Years 1966 and 1967. Manpower Research, Inventory for Fiscal Year 1968. Collections by Interagency Committee on Manpower Research.

. . . and has published

Office of Education Research Reports, 1956–1965. Research reports received before the publication of RESEARCH IN EDUCATION. Two volumes: abstracts of reports and indexes of reports by author, institution, subject, and report numbers.

ERIC Catalog of Selected Documents on the Disadvantaged. Documents dealing with the special needs of the disadvantaged. Two volumes: *Number and Author Index* and *Subject Index.*

How to Use ERIC. A graphic aid to the use of the ERIC system.

You use ERIC

To keep informed on educational research through the monthly issues of RESEARCH IN EDUCATION

To conduct literature searches by consulting the ERIC Thesaurus and indexes . . . scanning ERIC abstracts . . . identifying specific reports or articles

To obtain identified documents by ordering from the ERIC Document Reproduction Service . . . in hard copy or microfiche . . . see RESEARCH IN EDUCATION for instructions for ordering documents.

FIGURE 4 Continued

Interface Between the Satellite Centers and the Model Dissemination Center

Ideally, each of the Satellite Centers should have a complete ERIC collection and the equipment necessary to use in that collection in an effective way. These would include microfiche readers and copiers, as well as sophisticated information retrieval systems. Practically, however, this is not possible simply because of the cost involved. It is the mission, therefore, of the Model Dissemination Center to provide access as to the ERIC collections, necessary equipment, and computer-based information system in as effective and inexpensive manner as possible. It is possible to provide an effective working arrangement between Satellite Centers and the Center in Raleigh if one adheres to established and relatively formal procedures. Two important documents have been prepared which will enable Satellite Centers to see in detail the organization aspects and operational characteristics of the Model Dissemination Center. These are the Organization and Operation Procedures Manual and a training manual for the Research Analysts in the Research and Information Center. These manuals cover the organizational characteristics in the Model Dissemination Center and the manner by which that Center relates to the Satellite Centers in the field, provide a background in the basics of information retrieval, information concerning the ERIC collection, and detailed operational characteristics of the information retrieval system which is used by the Research Analysts. It will not, however, be possible (as in the ideal sense) for local Satellite Center personnel to become so expert and knowledgeable in the operation of either the Model Dissemination Center or the computer-based retrieval system

operated by the Science and Technology Research Center. It is necessary, therefore, for Satellite Center personnel to have some working knowledge of the arrangements between the Satellite Centers and Dissemination personnel in Raleigh. Although Satellite Center employees who desire to become more familiar with the internal operations of the Model Dissemination Center and the operation of the computer-based retrieval system are referred to these manuals, the principal means of contact will be either through personal contact between Dissemination Center personnel and the Satellite Center or through convenient means of U.S. mail or telephone. The primary point is that one or more Satellite Center personnel should be recognized within the Satellite Center as the contact point to whom people in that organization would be referred for processing of computer-based information requests. Satellite Center employees would then assist local personnel in the statement of their problems, completion of the necessary forms, submission of these forms to Raleigh either by mail or telephone, and then review of computer output to insure a valid response to the question.

Satellite Centers will be concerned with three basic forms taken from the Organization and Procedures Manual. These are the Search Request and Statement forms for the Local Education Agencies and Satellite Centers, form MDS-1.1; the Statement of Search Strategy, form MDS-2; and Document Request, form MDS-4. Statement of Research Question, form MDS-1.1, enables the Research Analyst to identify the person requesting the use of the system, to obtain some clear picture of his job and need for use of the system, and the extent of impact of his request. Certain of these items are necessary for Dissemination Project management to report to the funding agencies

STATEMENT OF RESEARCH QUESTION

Local Education Agencies and Satellite Centers

(1-5) Bibliography Number _____
(6) Research Analyst _____
(7-9) Date Received _____

For Project Use Only

(10-30) Name (Last name - Initials) _____(31-36) Date_____

(37) Is this a restatement of a previous question? _____(38) Number _____

(39-40) Administrative Unit _____

(41) This information will be chiefly used in which of the following functions?

(1) Project or proposal research

(2) Thesis or dissertation research

(3) To assist in literature review for a course I am taking

(4) General or personal information

(5) Need for instructional materials

(6) Demonstration of the system

(7) Administrative or managerial assistance

(8) Other (please specify)_____

(42) The information will be chiefly used in which of the following positions or occupations?

(1) Superintendent

(2) Assistant Superintendent

(3) Supervisors

(4) Project Director

(5) Principal

(6) Counselor

(7) Teacher

(8) School Board

(9) Other Please specify)_____

(45) An acceptable response time would be:

(1) one day

(2) 2 - 3 days

(3) one week

(4) 2 - 3 weeks

(5) 4 - 6 weeks

(6) Other (please specify) _____

46) Which of the following files would you like the search to cover?

(1) ERIC Research in Education (RIE) Computerized

(2) ERIC Current Index to Journals in Education (CIJE) Computerized

(3) Both RIE and CIJE Computerized

*(4) Manual search of non-ERIC files

*(5) Comprehensive search of ERIC and non-ERIC files

47) Which of the following outputs would you like to receive?

(1) Accession number and a one-hundred character title Computerized

(2) Complete abstracts Computerized

*(3) Research analyst selected abstracts

*(4) One to two-hundred word summary

*(5) Research analyst selected microfiche

*(6) All microfiche

*(7) Annotated bibliography

*(8) Five to fifty page summary

*(9) Other (please specify)_____

48) The number of persons who will be directly affected (teachers, pupils, staff) by this information.

(1) My own personal information

(2) Less than 10

(3) 11 - 35

(4) 36 - 200

(5) 201 - 500

(6) 501 - 2000

(7) 2001 - 10,000

(8) 10,001 - 50,000

(9) Over 50,000

*The availability of these services is dependent upon staff workload

oblem Statement. Be as specific as possible. If an ERIC thesaurus of descriptors available, it should be of assistance in wording your problem. Best results are tained by not being too specific in areas where little has been written and being ther specific in areas where a lot has been written. Give as much information as ssible.

_____of_____

SEARCH STRATEGY

H TITLE _____
LAST NAME, INITIALS - DESCRIPTIVE TITLE

YOU PICK UP YOUR SEARCH _____PHONE_____
NG ADDRESS_____

SEARCH TO_____

OU USE THE ERIC THESAURUS? ____ STRC DICT.?____

E RUN ON: RIE FILE____, CIJE FILE____, BOTH____
E SEND ME: TITLES____, ED NUMBERS ONLY ____,
ABSTRACTS ____.

Bibliography Number _____
Research Analyst _____
Time & Date Received _____

Initialized	Action	Time	Total Time
Research Analyst	Interview		
	Forms Comp.		
	Transportation		
Programmer	Key Punch		
	Transportation		

Total Number of Postings _____
Total Number of Terms _____
Total Number of Groups _____
Total Number of Intersections _____
Estimated Number of Hits (100) _____
Time to Run _____
Total Number of Hits _____
Batch Number_____
Number of Questions in Batch _____

FOR PROJECT USE ONLY

IC CODE	DESCRIPTOR TERM	NUMBER OF POSTINGS

OGIC EQUATION: _____

DOCUMENTS REQUEST RECORD

RA	DATE	ACTION	TIME

FOR PROJECT USE ONLY

iography Number _____

irch Analyst Who Prepared Bibliography

ess _____

PLEASE SEND ME THE FOLLOWING:

ABSTRACTS		MICROFICHE		DOCUMENTS	
ession Number	Date Sent	Accession Number	Date Sent	Accession Number or Title	Date Sent

end all abstracts Send all microfiche

eturn to: (Research Analyst's Name), Research & Information Center, State Department of Public Instruction, Raleigh, North Carolina 27602

9/28/70

concerning overall operation of the system. Search Strategy Form MDS-2, will be used by the Research Analyst to put the question into a proper format before it can be submitted to the machine. In addition, this form records information necessary for determining cost of operation of the system. The last form, MDS-4, Documents Request Record, is used by the Research Analyst and the user in order to facilitate shipment and exchange of documents available at the Research and Information Center to the user. The use of these forms provides the primary basis for interface between the Dissemination Center operations in Raleigh and by dissemination operations in the field. Adherence to and usage of these forms is mandatory.

III. THE USE OF INFORMATION RETRIEVAL SYSTEMS

Basic operating instruments for the Satellite Center and Research Analysts are the forms described in Section II above. However, these are not the only forms, obviously, which are required for effective interface of Satellite Center personnel and use of the retrieval system. In addition, further forms and materials are provided which enable the user to operate the system. These materials are absolutely critical to the successful operation of the system. It will be impossible for a user to interface with the retrieval system without them.

The Language of Retrieval

The computer-based retrieval system used by the Model Dissemination Center is very specific in terms of the language used in its operation. Once a concise statement of the user's research problem has been obtained, the task is then to state that problem in terms which the machine can accept.

This means that one must use the language of the retrieval system, contained in the ERIC Thesaurus of Authorized Descriptor Terms and the STRC dictionaries. Documents submitted into the computer system are documents for which abstracts have been published in RIE and CIJE and have been indexed in accordance with certain carefully controlled lists of authorized descriptors. These descriptors are usually called keywords, descriptors; or, in terms of the ERIC system, identifiers and descriptors. Terms are selected from the lists of authorized descriptors contained in the ERIC Thesaurus and STRC word lists which most nearly describe the subject content of the research question. These are then grouped into equation form by the Research Analyst for machine processing. Satellite Center personnel need not be concerned with the specific translation of search questions into computer acceptable form. This task is to be that of Research Analyst in the Research and Information Center. The principal task for Satellite Center Analyst is to make sure that the problem has been correctly stated and that this statement is within the realm of those questions for which one could expect a reasonable response from the ERIC data files. It should be the responsibility of the Satellite Center Analyst to understand the basic operational characteristics of the retrieval system as described above and contained in the Research Analyst Training Manual, but not to the degree necessary for them to present completed search statements to the machine. Once the user has requested the preparation of a bibliography and has received that bibliography, the Satellite Center Analyst should then be in a position to assist the user in obtaining any and all of the documents which he considers relevant to the problem as stated.

IV. EVALUATION AND RESPONSE

In addition to helping the user obtain the documents which have been flagged by the retrieval system as being pertinent to his problem, the Satellite Center Analyst should be of considerable assistance in helping the user evaluate the response which is obtained from the machine. Clearly, any machine-based retrieval system is prone to errors. Errors in the operation of this retrieval system are inherent in the fact that, although the vocabulary used by the system is structured in the form of a thesaurus, problems of definition and specific meaning of descriptor terms will continually arise. Furthermore, it is sometimes difficult for a user to think of his problem in terms of highly specific and defined terminology. As the Satellite Center Analyst gains experience and knowledge as a result of submittal of research statements and review and evaluation of system output, he will gain maturity in evaluation of a system response and be better able to determine when the system has responded correctly and positively to the research statement; and, to determine when submittal of a particular research statement to the data base is inappropriate. The first question to be posed when research data has been returned is: "Does the output answer the question as posed by the user?" As mentioned before, there are times when it is impossible to determine specifically what a particular keyterm might mean. It then follows that, if specific meanings of keyterms are not available, it is possible to structure questions which result in an inappropriate response by the machine. Inherent in this situation is the possibility that the user himself might not fully understand the problem which he is trying to pose. We then come upon one of the side benefits of an information dissemination system: the statement of a research question by the user in highly specific

terms can sometimes aid him in the solution of the problem itself. The mere act of stating the problem in clear and concise terms is a reinforcement towards the solution of that problem. In those cases in which either of the two situations described above may occur, which is to say that the output does not respond to the question as posed by the user or that the user himself does not specifically understand the question which he wishes to pose, it may be necessary to ask if the question itself should be rephrased and the problem resubmitted. The retrieval system in use by the Model Dissemination Center will enable the user to pose questions to the machine more than once, so that the preparation of a bibliography can be approached in an iterative fashion. This is to say that once a question has been posed and output evaluated, it may be necessary to repose the question in light of the information gained from the first (or previous) run. The forms prepared for operation of the Dissemination Center allow for resubmittal of questions in order to take advantage of this iterative approach to problem solution.

The User Evaluation Form should be completed by the person who requested the search after the work has been completed. This is to provide the program monitor with quantitative information relative to system performance and constitutes a vital part of its operation.

Bibliography Number _____
Research Analyst _____
Date Sent _____
Date Received _____

For Project Use Only

User Evaluation

Dear _____:

On _____, we ran a search for you entitled _____. There were _____ hits for this ERIC search.

Please respond to the following.	Strongly Agree . . .				Strongly Disagree
1. The entire search procedure was difficult to use.	SA	A	?	D	SD
2. The service was slow.	SA	A	?	D	SD
3. The directions given were hard to follow.	SA	A	?	D	SD
4. The _____ was interested in helping me.	SA	A	?	D	SD
5. There was too much paperwork.	SA	A	?	D	SD
6. I was able to get assistance when I needed it.	SA	A	?	D	SD
7. The computer output was informative and useful to me.	SA	A	?	D	SD
8. The microfiche or other non-computerized outputs were difficult to use.	SA	A	?	D	SD
9. The materials were delivered when promised.	SA	A	?	D	SD
10. The information was not worth the time and cost to me.	SA	A	?	D	SD
11. Approximately how many of these titles have you looked at in the abstracts journal (RIE)?	_____				
12. How many titles have you looked at on microfiche or ordered hard copies of?	_____				

13. Based on your experience in this area, circle the degree to which you think the titles from the search are representative of the work done (or being done) in this area.

(a) I do not have enough experience in this area to evaluate the titles _____.

(b) Very poorly 1 2 3 4 5 6 7 Very Well

14. Please circle the degree to which you feel the search adequately met your needs.

Very poorly						Very well
1	2	3	4	5	6	7

15. The service could be made more valuable to you personally by

_____ (a) reducing the time between search request and abstract delivery

_____ (b) reducing the time between document request and delivery

_____ (c) have field services more often

_____ (d) have a microfiche reader closer to me

(e) Other _____

_____

_____

16. Additional comments: _____

_____

_____

_____

Please return to: Robert C. Evans, Jr.
Division of Research
Department of Public
Instruction
Raleigh, N.C. 27602

APPENDIX A

GUIDELINES FOR SEARCH REQUEST TO

RESEARCH AND INFORMATION CENTER

1. Obtain a clear and concise statement of the user's problem.
2. Complete the proper Search Request form.
3. If you have any trouble in determining whether or not the search request is a proper one for ERIC, do not hesitate to call the Research and Information Center. Ask for one of the Research Analysts in the ERIC Center.
4. Either relay the search request by mail or phone it in to a Research Analyst.
5. Give the person who made the search request some idea of the time required to receive his search. The Research Analyst can tell you the approximate time required to process the request at the RIC.
6. When you receive the search results, review them to make sure that you have properly communicated with the Research Analyst. If the search does not appear to answer the original question, it may need to be resubmitted.
7. Review the search output with the requestor.
8. Complete the necessary evaluation report forms.
9. Maintain complete records of all searches and retain copies of forms submitted in your own files.

RESEARCH & INFORMATION CENTER

R I C M A N U A L

REFERENCE MANUAL FOR INFORMATION SPECIALISTS

A FIRST ENCOUNTER WITH RIC, THE RESEARCH & INFORMATION CENTER

Background The Research & Information Center was created in 1960 with State funds as a supportive arm of the State Educational Agency and served only SEA staff in the beginning. The RIC's activities have expanded with the aid of Federal funding to provide information services to the entire State.

This manual, utilizing many of the thoughts and ideas of a similar manual prepared in North Dakota, briefly summarizes the activities which information specialists might be called upon to provide. These activities, in the order in which they will be discussed, are:

PROVIDE INSERVICE TRAINING IN THE USE OF EDUCATIONAL INFORMATION

It is only through personal contact with someone who understands the services which are available that educators will use the services. Simply distributing a written description will not suffice. For these reasons it is suggested that each information specialist conduct at least one inservice program for the other educators in his school or district.

A written description of services, a copy of which is attached to this manual, has been prepared which may be distributed during the inservice program to all these in attendance. The description of services is intended to serve those in attendance at the inservice workshop as a permanent record, in addition to any notes they take, of what they learn from the inservice program. This written description also identifies you as the information specialist for your school or district.

It must be noted that the first inservice program is primarily intended to inform educators about what services you and the Research & Information Center (RIC) provide. You will probably want to follow up on this training. Certainly in future years, as RIC expands to serve educators more effectively, additional inservice programs will be developed.

Your first step will be to request your school administrator to place you on the agenda of a regularly scheduled teachers meeting. A half hour or less should suffice unless there are numerous questions.

If questions are raised by fellow staff members which you do not feel were adequately covered in the regional workshops for information specialists, please indicate what these questions were. We would like to know the local concerns of those with whom you work so that we can provide all information specialists with detailed explanations.

ASSIST TEACHERS AND ADMINISTRATORS IN IDENTIFYING DESIRED INFORMATION

As an educator you are certainly aware of the tremendous, ever increasing volume of written, audio, and visual materials directed at education. You have probably heard the term "knowledge explosion" applied to this phenomenon. It is no longer possible for the individual teacher, the administrator, or even the school district to maintain a comprehensive collection of professional educational information or to read even a small portion of the information. Nevertheless, educators continue to require information on numerous topics, i.e., curriculum issues, new administrative patterns, instructional materials, etc.

Recognizing the necessity of assisting educators obtain the information they need, the Department of Public Instruction established RIC. It is RIC's responsibility to obtain and maintain pertinent professional educational information and materials. Any educator having a question who writes or calls RIC will find staff members eager to search through the available information resources in an attempt to answer the question posed.

Six major goals in the flow of information to the correct person at the correct time have been identified:

1. Bridge the information gap between the user of information (you, the reader) and the information system (RIC) which serves him.

2. Reorient the user of information to be an active seeker of high-quality information, the information system to be an active provider of high-quality information and the administration to be an active supporter of both.

3. Extend the information system inward to the user by providing a quick and easy acquisition of desired information.

4. Extend the information system outward to the information community in general, by the appropriate utilization of available information resources - such as those offered by national mission-oriented information networks, national product-oriented information services, national discipline-oriented information activities, national library-oriented information functions, national information cooperatives, and regional information cooperatives.

5. Expand the information system to include expert personnel for functioning interactively as both information sources and connections with the informal information system ("professional ingroups").

6. Expand the information base to include information media which are more diverse in orientation and mode of expression (repackaging of reports).

To accomplish the second goal, you must be of assistance to other educators in defining their information needs. When you discuss a need with teachers, you may find yourself in the situation of not knowing exactly what he wants. Help him develop his request by asking leading questions as to subject matter, special group of interest, etc. For example, the following conversation between you and a teacher might take place.

Teacher	You
I need some more materials on reading.	Are you looking for descriptions of new programs or curriculum guides or instructional materials?
Well, I guess I'm really looking for instructional materials.	Are these for use with the individualized curriculum project?
Yes, I can't find many materials on using the cassette tape for my below average readers.	Are these children disadvantaged or special education children?
They are below grade level readers with IQ's from 85 - 110.	That's a rather specific request. Would you like to have materials on the use of any media with disadvantaged reading programs?
Yes, anything you can find would be a big help.	All right, we'll give the people at RIC a call later today and I'll let you know how long they think it will take to process your request. What's your phone number?

Therefore, instead of sending in a request for "reading materials," your request might be: "We need instructional materials on the use of media in reading programs for elementary schools. Our particular interest is in using cassette tape players for children who are reading below grade level." As you can see, there is a big difference in the two requests!

REQUEST LITERATURE SEARCHES, STUDY RESULTS AND OBTAIN DESIRED INFORMATION

Request Literature Searches

What do you do once you or a fellow educator has a problem or need for which some information could be used? If the required information is not available in your school or community library, or other local information source, you can contact the Research & Information Center (RIC). They will not only attempt to assist you directly, but will also identify other information sources which might possibly assist you.

How do I contact RIC? You can pick up a telephone and call 919 - 829-7904 or you can write to the following address:

Gladys Ingle
Research & Information Center
N. C. Department of Public Instruction
Raleigh, North Carolina 27602

A personal visit to the office of RIC, 5th floor, Education Building, at the corner of Edenton and Salisbury Streets will also be welcomed.

Facilities include several large rooms with one room containing reference materials; special collections and processing with one copier and microfiche reproducer are located in another; the ERIC collection and other microforms as well as three reader printers and one microfiche reader are located in a third room. Current periodicals and information files are maintained in a room which is also used as a reading and study room. Another room doubles as the Directors office and Conference room.

There are seven full-time staff members to assist in processing information requests.

What do I need to do when I contact RIC? Use of RIC has been made very simple so as to avoid inconvenience and wasted time on your part. All you must provide when you phone, write or visit RIC is:

1. Your name, address, and phone number
2. A brief statement of your problem

Study Results
What happens to my request after it reaches RIC?

- The statement of your request will be reviewed by one or more RIC staff members. It is at this time that you might be contacted by telephone to clarify your request.
- The RIC staff will attempt to identify other sources of information which might assist you besides what RIC has available.
- The comprehensive store of research information available from over 5,000 professional books, 275 periodicals, vertical information files, PREP kits and other collections will be examined for information germaine to your request.
- A computer search will be undertaken of over 50,000 educational materials including books, curriculum guides, research summaries, journal articles, descriptions of innovative programs, etc.
- Information from North Carolina educational programs and program consultants pertinent to your request will be identified.

What will I receive from RIC in response to my request? One type of material you will probably receive from RIC is a computer printed list of materials which might be pertinent to your request and which are available through RIC.

A sample of a computer printed response for one item of material is shown on the next page. The RIC staff will also prepare a typewritten list of other information sources for you.

SAMPLE ENTRY

ERIC Accession Number—identification number sequentially assigned to documents as they are processed.

Author(s).

Title.

Organization where document originated.

Date published.

Contract or Grant Number—contract numbers have OEC prefixes; grant numbers have OEG prefixes.

Alternate source for obtaining documents.

EDRS Price—price through ERIC Document Reproduction Service. "MF" means microfiche; "HC" means hard copy. When listed "not available from EDRS" other sources are cited above.

Legislative Authority Code for identifying the legislation which supported the research activity (when applicable). *

Clearinghouse accession number.

Sponsoring Agency—agency responsible for initiating, funding, and managing the research project.

Report Number and/or Bureau Number—assigned by originator.

Descriptive Note.

Descriptors—subject terms which characterize substantive contents. Only the major terms, preceded by an asterisk, are printed in the subject index.

Identifiers—additional identifying terms not found in the Thesaurus of ERIC Descriptors.

Informative Abstract.

Abstractor's initials.

ED 013 371 64 **AA 000 223**
Norberg, Kenneth D.
Iconic Signs and Symbols in Audiovisual Communication, an Analytical Survey of Selected Writings and Research Findings, Final Report.
Sacramento State Coll., Calif.
Spons Agency—USOE Bur of Research
Report No.—NDEA-VIIB-449
Pub Date—15 Apr 66
Contract—OEC-4-16-023
Note—129 p. speech given before the 22nd National Conference on Higher Education, Chicago, Ill., 7 Mar 66.
Available from—Indiana University Press, 10th and Morton St., Bloomington, Indiana 47401 ($2.95)
EDRS Price—MF-$0.75 HC-$5.24
Descriptors—*Bibliographies, *Communication (thought transfer), *Perception, *Pictorial Stimuli, *Symbolic Language, Instructional Technology, Visual Stimuli.
Identifiers—Stanford Binet Test, Wechsler Intelligence Scale; Lisp 1.5; Cupertino Union School District.
The field of analogic, or iconic, signs was explored to (1) develop an annotated bibliography and (2) prepare an analysis of the subject area. The scope of the study was limited to only those components of messages, instructional materials, and communicative stimuli that can be described properly as iconic. The author based the study on a definition of an iconic sign as one that looks like the thing it represents. The bibliography was intended to be representative and reasonably comprehensive and to give emphasis to current research. The analysis explored the nature of iconic signs as reflected in the literature and research. * * * * (AL)

* **The key to these codes is as follows:**

Code	*Description*
08	Adult and Vocational Education, Public Law 88–210
16	Captioned Films for the Deaf, Public Law 85–905
24	Cooperative Research, Public Law 89–10, Title IV
32	Disadvantaged Students Program, Public Law 89–10, Title I
40	Handicapped Children and Youth, Public Law 88–164
48	Language Development, Public Law 85–864, Title VI
52	Library Research and Development, Public Law 89–320, Title II, Part B
56	New Educational Media, Public Law 85–864, Title VII, Part A
64	New Education Media, Public Law 85–864, Title VII, Part B
72	Research in Foreign Countries, Public Law 83–480
80	State Educational Agencies Experimental Activities, Public Law 89–10, Title V, Section 505
88	Supplementary Centers and Services, Public Law 88–10, Title III
95	Other Office of Education Programs

Obtain Information Desired
What do I do with this information from RIC? Study the information. In particular, read the titles and abstracts of the materials found on the computer typed list. When you identify materials for which you wish to see the entire document, write or call RIC to request the document. A gold color coded form will be provided for you to use in describing the materials you want (see the next page for a sample copy of this form); however, the basic data RIC requires to fill your request is your name, address, title of the documents you want, the document numbers, and whether you want microfiche or xerox copies.

> REMEMBER THAT XEROX COPIES OF A DOCUMENT ARE ABOUT 100 TIMES MORE EXPENSIVE THAN MICROFICHE. SINCE RIC MUST LIMIT THE NUMBER OF XEROX COPIES PER SCHOOL, UNLESS YOU KNOW THE DOCUMENT IS SOMETHING YOU CAN USE, IT WILL BE MORE ECONOMICAL IF YOU ORDER MICROFICHE. MICROFICHE READERS ARE AVAILABLE AT MANY LIBRARIES AND UNIVERSITIES. *

ESTABLISH INFORMATION COLLECTIONS IN LOCAL SCHOOL(S)

As a media specialist or school librarian you are already engaged in establishing information collections in your school system. While these collections are primarily learner oriented, some of the information is also of use to educators. The staff of the Research & Information Center (RIC) will help you expand your information collections for educators.

Periodically information materials will be sent you for inclusion in a notebook. The manual for information specialists which you are presently reading is one of the items you may wish to include in your notebook. For example, during 1970-71 several brief reviews of the literature on topics of critical concern to many educators will be prepared and distributed to all information specialists. A newsletter containing brief notes on pertinent topics will also be distributed. One copy of everything provided you by RIC should be included in the notebook as a means of establishing a permanent information collection.

What else must be done within my school district? You must not overlook the necessity for reference materials and equipment to assist in utilizing the available information. Just as you need shelves, tables, chairs and filing cabinets to use books; you need microfiche readers, printers, etc. to use other types of information. The following list of items identifies the materials and equipment recommended as useful in order to use RIC most effectively.

LIST OF SUGGESTED EQUIPMENT AND MATERIALS FOR LOCAL SCHOOL DISTRICTS

	Item	Approximate Cost
1.	Subscription to Research in Education (RIE)	$ 21 per year
2.	Subscription to Current Index to Journals in Education	$ 32 per year
3.	Thesaurus of ERIC Descriptors	$ 9 per year
* 4.	Low cost microfiche reader or microfiche reader/printer	$400 to $2000

Further information on any item in the above list can be obtained by writing to RIC.

DOCUMENTS REQUEST RECORD

RA	DATE	ACTION	TIME

FOR PROJECT USE ONLY

iography Number _____

arch Analyst Who Prepared Bibliography

_____

_____

ess _____

_____

_____

_____

PLEASE SEND ME THE FOLLOWING:

ABSTRACTS		MICROFICHE		DOCUMENTS	
ession Number	Date Sent	Accession Number	Date Sent	Accession Number or Title	Date Sent

end all abstracts Send all microfiche

eturn to: (Research Analyst's Name), Research & Information Center, State Department of Public Instruction, Raleigh, North Carolina 27602

9/28/70

E R I C *Your Guide to Current Educational Information*

Your problems in finding and using information about the latest advances in educational improvements and results of research are shared by most educators. And little wonder! Changes come fast. Knowledge is multiplying. Reports, papers, articles, and books threaten to inundate us. Over 35,000 separate reports and close to 20,000 articles relevant to education appear annually in periodicals. No matter how much you want to or try, you cannot, by yourself, keep up with the outpouring of information, even on specialized topics.

Yet each day you could benefit from the information coming from educational improvements occurring in schools all over the country--if only you could:

. Turn to one source for comprehensive information about new developments and research results; and

. Obtain copies of any reports you want, and rather promptly, regardless of where the report originated.

Now, for the first time in education, both things are possible. Any educator, anywhere, can benefit from the results of millions of dollars spent in the United States on educational research and development and program improvement. ERIC, the Educational Resource Information Center, a program designed and supported by the U.S. Office of Education, provides a comprehensive and systematic link between researchers and users. ERIC can be your guide for locating educational reports that you may want on a specific topic from the thousands released each month.

HOW ERIC HELPS YOU

ERIC helps you by organizing current, significant information into an instant ready-to-use library. ERIC allows you to use your professional time and talent in applying information, instead of wasting your time in often fruitless searching for needed information. Specifically, ERIC specializes in bringing information to you by:

1. Searching systematically to acquire all reports relevant to education -- from schools, State Education Departments, colleges, universities, professional organizations, businesses, Government Agencies, and foreign sources. Over 35,000 are acquired annually.

2. Selecting only current, significant, new reports to dissemination. Only about one-third of those acquired are disseminated.

3. Preparing an abstract of the reports, so you can decide if you want the whole report, and assigning key words or descriptors to the reports, so you can identify ones you want from the thousands disseminated annually by ERIC.

4. Providing you with information about new reports added to the ERIC collection through a monthly abstract journal called Research in Education (RIE). About 1,000 reports on many educational topics are cited in each issue of RIC.

5. Reproducing reports through the ERIC Document Reproduction Service (EDRS) so you can obtain copies when you want them.

6. Preparing special collections of reports, in addition to those cited in RIE. Each year, for example, work plans for all programs funded under Title III, ESEA, are released in the ERIC-Pacesetters in Innovation Series.

7. Supporting publication of a guide to periodical literature relevant to education. This monthly publication is called Current Index to Journals in Education (CIJE) and covers over 500 journals of interest to educators.

RESEARCH & INFORMATION CENTER

R I C

APRIL 14, 1971

Dear Fellow Educator:

We, the staff of the Research & Information Center (RIC), wish this could be a personal letter. We are sure you realize the difficulty of personally writing every educator in North Carolina. However, we do feel a personal contact is necessary in each school district; therefore, we have invited a faculty member of your school, _____, to participate in a regional meeting concerning the services offered by RIC. However, we welcome the opportunity to personally correspond or talk with you any time you wish.

Your first question will be - Who is RIC; What services does it provide? The remainder of this letter and the attached brochure describe RIC. Please read this information and then use RIC; it is available to serve the educators of North Carolina.

Sincerely yours,

Gladys Ingle

The Research & Information Center (RIC) is a program of the North Carolina State Department of Public Instruction. As the title indicates, RIC is concerned with the resource and information needs of North Carolina's educators. (Some examples of educational information are written reports, monographs, bibliographies, etc. Other types of non-printed materials, such as a type of microfilm called microfiche [4 x 6 cards] which require special readers, also are included under materials.) RIC was established to work with educators of the State Department of Public Instruction to identify their information needs. However, based on more and more requests, the RIC is spreading its services throughout the State. The RIC can offer the following services.

1. Inservice training in the use of educational resources.
2. Assistance in identifying desired information and resources.
3. Provision of literature searches at the request of educators.
4. Action answers to educational questions posed by letter and telephone.
5. Availability via mail of a comprehensive materials collection.
6. Establish regional centers containing reference materials and personnel to assist educators.
7. Bibliographies of information in response to educator needs.
8. Short reports on subjects of critical concern to North Carolina educators.

We anticipate that you will contact your school's information specialist to assist you in using RIC. (Your information specialist can assume for you many of the time-consuming tasks of obtaining the information you need.) Your information specialist can assist you in: (1) identifying your problem, (2) stating your problem in question form, (3) obtaining from RIC information concerning the materials RIC has in answer to your question, and (4) obtaining from RIC more comprehensive information to meet your requirements.

The final two services on the list indicate special products of RIC which, along with a newsletter, will be concerned with critical topics of special interest to many educators. These will be distributed to the information specialists with the request that the specialists encourage all their fellow faculty members to study them as they relate to local needs and interests.

Let us review in step-by-step fashion how to use RIC.

1. Identify as clearly as possible the problem or need.
2. State your problem or need in a few sentences. Be as specific as possible.
3. Contact RIC, or your information specialist, about your problem. You can expect a personal response from a RIC staff member so that he can gain further understanding of your problem.

The address of RIC:

Gladys Ingle
Research & Information Center
State Department of Public Instruction
Raleigh, North Carolina 27602
Phone: 919 - 829-7904

4. You will receive from RIC short abstracts of materials pertinent to your problem. If the abstracts of the materials appear useful, complete the attached form requesting more information from RIC.
5. Feel free to contact any person involved in this service from the information specialist to the regional center and RIC for any kind of information service, especially any service not presently provided.

The staff of RIC look forward to assisting you with your information requirements. Education is only as good as we make it; and it cannot improve unless the best administrative and instructional approaches are identified from the wealth of available information and placed into practice.

SCIENCE AND TECHNOLOGY RESEARCH CENTER

SOUTHEASTERN REGIONAL

WHOLESALE PRICE SCHEDULE

ON

ERIC RIE AND CIJE FILES

MAY 1971

UNNEGOTIATED SEARCHES - (WHOLESALE)

COMPREHENSIVE

Both Files with abstracts on RIE and bibliographic citations on CIJE

$28.50	=	3.00	load sheet and keypunching
		25.00	machine time
		.50	duplication and mailing

* RIE *				* CIJE *
			Abstracts	
$17.00	=	1.50	load sheet and keypunching	------
		15.00	machine time	
		.50	duplication and mailing	
			Bibliographic Citations	
$12.00	=	1.50	load sheet and keypunching	= $11.50
		10.00	machine time (RIE)	
		9.50	machine time (CIJE)	
		.50	duplication and mailing	

SELECTED INTERVALS *

Abstracts

(Last quarter or an interval of 3000)

$7.00	=	1.50	load sheet and keypunching ------
		5.00	machine time
		.50	duplication and mailing

(Last year or an interval of 10000)

$12.00	=	1.50	load sheet and keypunching ------
		10.00	machine time
		.50	duplication and mailing

Bibliographic Citations

(Last quarter or an interval of 3000)

$5.00	=	1.50	load sheet and keypunching	= $5.00
		3.00	machine time	
		.50	duplication and mailing	

(Last year or an interval of 10000)

$9.00	=	1.50	load sheet and keypunching	= $9.00
		7.00	machine time	
		.50	duplication and mailing	

Definitions

load sheet and keypunching

1. receipt of TWX or mail request
2. preparation of a load sheet and program card
3. review of spelling and postings
4. keypunching
5. pickup and delivery of computer input and output
6. preparation and sending of TWX output

machine time

1. CPU time
2. I/O time
3. computer paper
4. update cost
5. error rate
6. disk pack rental
7. tape conversion

duplication and mailing

1. bursting and colating
2. copy cost
3. cover preparation and assembly
4. cover cost
5. packaging and mailing(postage)

*** Selected Interval**

Limited to ten terms and 5,000 postings

negotiation and review @$5.00/hour

1. TWX interchange if necessary
2. preparation of terms and strategy
3. review of output from computer
4. transportation to RIC or other library
5. review of other materials
6. letter describing these other materials

NOTE : under selected interval, review includes only steps 1 and 2

NEGOTIATED SEARCHES

COMPREHENSIVE

Both Files with abstracts on Rie and bibliographic citations on CIJE

$50.00 = 28.50 unnegotiated
21.50 negotiation and review

* RIE * * CIJE *

Abstracts

$30.00 = 17.00 unnegotiated
13.00 negotiation

Bibliographic Citations

$25.00 = 12.00 unnegotiated RIE (11.50 CIJE) = $24.50
13.00 negotiation and review

SELECTED INTERVALS *

Abstracts

(Last quarter or an interval of 3000)

$12.00 = 7.00 unnegotiated -------
5.00 negotiation and review

(Last year or an interval of 10000)

$17.00 = 12.00 unnegotiated ------
5.00 negotiation and review

Bibliographic Citations

(Last quarter or an interval of 3000)

$10.00 = 5.00 unnegotiated = $10.00
5.00 negotiation and review

(Last year or an interval of 10000)

$14.00 = 9.00 unnegotiated = $14.00
5.00 negotiation and review