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ABSTRACT

This paper reports the results of the testing and use of a batch-mode program, QUERY, in three large computer runs performed by the ERIC (Educational Resources Information Center) Clearinghouse on Teacher Education from March through August 1970. Focus is on the behavior of QUERY as a search tool, not on cost-benefit analysis or comparison with alternative search tools. Section 1, "Findings," contains a description of how QUERY searches the descriptor field of ERIC resumes and the results of 39 different searches of the Research in Education (RIE) and Current Index to Journals in Education (CIJE) tapes. The analysis of output for each search--25 of them substantive (related to information analysis activities of the CLEARINGHOUSE) and 14 serving both substantive and experimental purposes--includes the number of documents retrieved, percentage of relevance, notes on significant characteristics of relevant and irrelevant documents, etc. Section 2, "Outcomes," presents practical implications and general impressions of the findings. Included are examples of improvements in question translation as a result of the study, a nine-step guide to the use of QUERY in searching the ERIC files, and recommendations for further testing of the program. (JS)

A Report on the Utilization of the Computer Program QUERY By the ERIC Clearinghouse on Teacher Education

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INTRODUCTION

Beginning in March, 1969, the ERIC Clearinghouse on Teacher Education has been involved in testing the use of a batch-mode program, QUERY, made available through Central ERIC, USOE. Use of the program by the Clearinghouse was severely limited until Central ERIC provided funds for some computer time during the current year. Whereas only about six hours of computer time were used during the 1969-70 period, the Central ERIC support makes it possible for us to purchase more than one hundred hours during the current period. Our ability to purchase this significant amount of computer time has in no small measure been facilitated by the National Education Association which has let us use its computer facility at very reasonable cost.

The intent of this report is to share with Central ERIC staff and other interested persons our experience with QUERY during the period from March through August, 1970. We feel that our findings may be helpful to other QUERY users.

Three large computer runs were performed during the period covered by this report. The first was entirely substantive -- all seventeen searches were related to information analysis activities of the Clearinghouse. Results of the first search indicated that we needed to know more about QUERY in order to gain optimum efficiency in computer searching with the program. Therefore, in addition to seven substantive searches, two experimental searches were included in the second computer run. The third run was comprised of thirteen searches. One of these was entirely substantive, and twelve served both experimental and substantive purposes in varying degrees.

This report is divided into two main sections. Section I, Findings, presents the results of analyses of output for each search. Some interrelationships among searches are drawn, although most inferences from the findings

will be found in the second section. Section II, Outcomes, presents implications and general impressions which the findings seem to support, and some recommendations for the use of QUERY and for further program testing.

The findings and outcomes presented in this report focus on the "behavior" of QUERY as a search tool. Cost-benefit analyses and comparisons with alternative search tools are outside the scope of this report.

SECTION I

FINDINGS

The findings are divided into two parts: 1) a statement of how QUERY searches the descriptor field of ERIC resumes, and 2) a statement of the results of 39 searches conducted in three separate computer runs during the period, March through August, 1970.

How QUERY Works in the Descriptor Field

The QUERY program has available four types of operators which can be used in conjunction with the retrieval key (defined below) to tell the computer what to look for. The four types of operators are: Logical Operators (LO); Relational Operators (RO); Context Operators (CO); and Context Modifiers (CM). The following table lists the operators available under each of the four types. Operators in large type are referred to in this report. Operators in small type have not been tested.

LO	RO	CO	CM
AND	EQUAL TO	PREFIX	FOLLOWED BY
OR	greater than	WORD	same word
	less than	TEXT	
	NOT	stem	
		suffix	
		byte	
		numeric	
		packed	

A *search element* for the descriptor field of an ERIC resume (descriptor field code not shown) using these operators would look like this:

(LO RO)RETRIEVAL KEY(CO CM)

Underlined operators are *required* in each search element. Others are optional.

The *retrieval key* (also named the "constant") is the descriptor or part of a descriptor for which the file is being searched.

The space or character preceding and following the retrieval key is the *context value*. What the context value should be in a search is indicated by the *context operator* ("prefix," "word," "text," etc.).

The following list shows the context values required by each of five different context operators:

"text"	(space or character)	RETRIEVAL KEY (space or character)
"word"	(space)	RETRIEVAL KEY (space)
"stem"	(character)	RETRIEVAL KEY (character)
"prefix"	(space)	RETRIEVAL KEY (character)
"suffix"	(character)	RETRIEVAL KEY (space)

The *retrieval value* consists of the retrieval key plus one space or character -- as defined by the context operator -- at the beginning and end of the retrieval key.

QUERY scans for the retrieval value starting from left to right in each subfield. A *subfield* is the "space" taken by one ERIC descriptor in the set of descriptors (descriptor field) within one ERIC document resume. In the RIE file, this is one space and then a descriptor. In CIJE, the subfield is just the descriptor with no space at the beginning. Subfields are divided by a subfield delimiter (semicolon), which indicates the end of the subfield and the beginning of another.

With "text" the first space of the subfield always conforms to the value indicated by the context operator, since the value for "text" is *either* a space *or* a character. QUERY then compares the first character of the retrieval key with the next character in the subfield. If these two characters are not the same, it skips to the next subfield. This "skipping" process involves scanning each subsequent character to see if it is a semicolon. When a semicolon is found, this signals the beginning of a new subfield, and scanning for the retrieval value resumes. The retrieval key is compared character-by-character with the subfield, for the length of the retrieval key plus one. When the retrieval value has been satisfied, the document is accepted, and anything to the right of the retrieval value within that subfield is "ignored."

With "word," "stem," "prefix," or "suffix," QUERY scans the first space of the subfield to see if it satisfies the context value specified (a space for "word" or "prefix" and a character for "stem" or "suffix"). If the first space does not satisfy the context value, it continues scanning character-by-character within the subfield until it finds the context value. Once the context value is satisfied, QUERY begins scanning the subsequent characters for the retrieval key. If the retrieval key is not found it resumes scanning for the context value in the subsequent characters. When the retrieval value has been satisfied, the document is accepted, and anything to the right of the retrieval value within the subfield is "ignored."

Search Results

Each search reported below is identified for convenience by a search number. The units value is the computer run of which the search was a part, and the decimal value is the sequence number of the search within its computer run. (Search 2.1 is the first search within the second computer run.) Each search is further identified with a brief title. The search elements are listed for each search under the heading "Translation." Elements in the same column are to be read as if "connected" by the logical operator, OR. Elements in different columns are to be considered as "connected" by the logical operator, AND.

Those searches which were formulated for program experimentation carry a statement of purpose after the title. Those search descriptions which do not have a purpose statement are substantive searches, the purpose of each being to find documents relevant to the subject given in the search title. References in the search descriptions to specific clearinghouses are not to be considered as criticism.

Search 1.1 Preparing School Personnel Relative to Values

Translation.

VALUES (word)	*TEACHER EDUCATION (text)
BELIEFS (word)	TEACHER EUUCATION (text)
	*INSERVICE TEACHER EDUCATION (text)
	INSERVICE TEACHER EDUCATION (text)
	*PRESERVICE EDUCATION (text)
	PRESERVICE EDUCATION (text)

Results. No documents were retrieved in this search. However, four documents turned up in other searches which had the proper combination of descriptors for this question. They are:

ED 025 545 (TEACHER EDUCATION, VALUES)
ED 022 823 (TEACHER EDUCATION, MIDDLE CLASS VALUES)
EJ 013 749 (TEACHER EDUCATION, *VALUES)
EJ 009 050 (*TEACHER EDUCATION, SOCIAL VALUES).

Search 1.2 Career Ladder Approaches for Paraprofessionals

Translation.

*PARAPROFESSIONAL SCHOOL PERSONNEL (text)	*CAREER OPPORTUNITIES (text)
*TEACHER AIDES (text)	*CAREER PLANNING (text)
*SUBPROFESSIONALS (text)	*VOCATIONAL DEVELOPMENT (text)
*NONPROFESSIONAL PERSONNEL (text)	*OCCUPATIONAL ASPIRATION (text)
*VOLUNTEERS (text)	*JOB TRAINING (text)
*SCHOOL AIDES (text)	*ON THE JOB TRAINING (text)
	*OFF THE JOB TRAINING (text)
	*CAREERS (text)

Results. Forty-three documents were retrieved in this search, with 81 percent relevance.

Irrelevant documents were retrieved under the descriptors *SUBPROFESSIONALS and *NONPROFESSIONAL PERSONNEL, and dealt with non-education jobs. However, some relevant documents were retrieved under these descriptors. They concerned general discussion of training paraprofessionals or training of all types of paraprofessionals, including school personnel.

A very few documents were retrieved that dealt with training of paraprofessional *school* personnel but which were not indexed under a "school

personnel" term. These and the other documents which partially concerned school personnel were usually processed by UD, AC, or VT. *ON THE JOB TRAINING and *OFF THE JOB TRAINING were useful descriptors, because there were a number of documents that were indexed with one of these and not with the more general descriptor *JOB TRAINING.

No documents were retrieved from CIJE, but a manual search turned up two documents with the proper combinations of descriptors. They are:

ED 022 340 (*SUBPROFESSIONALS, *CAREER OPPORTUNITIES)
EJ 013 736 (*PARAPROFESSIONAL SCHOOL PERSONNEL, *JOB TRAINING)

Search 1.3 Cooperative Teacher Education: School College Relations in Developing School Personnel

Translation.

*COLLEGE SCHOOL COOPERATION (text)	*TEACHER IMPROVEMENT (text)
COLLEGE SCHOOL COOPERATION (text)	*TEACHER EDUCATION (text)
*COLLEGE HIGH SCHOOL COOPERATION (text)	*PRESERVICE EDUCATION (text)
COLLEGE HIGH SCHOOL COOPERATION (text)	*INSERVICE TEACHER EDUCATION (text)
	*STUDENT TEACHING (text)
	*TEACHER WORKSHOPS (text)
	*LABORATORY SCHOOLS (text)
	*TRAINING LABORATORIES (text)
	*EXPERIMENTAL SCHOOLS (text)
	*COOPERATING TEACHERS (text)
	*PRACTICUMS (text)
	*FIELD EXPERIENCE PROGRAMS (text)
	*AFFILIATED SCHOOLS (text)

Results. A total of 94 documents was retrieved in this search, of which 95 percent were considered relevant. Most irrelevant documents were false drops -- long documents with information on both teacher education and college school cooperation, but with no relationships drawn.

Only seven documents, of which six were relevant, contained specific terms from the second column (like *LABORATORY SCHOOLS or *STUDENT TEACHING) without a general teacher education term (*TEACHER EDUCATION, *INSERVICE TEACHER EDUCATION, or *PRESERVICE EDUCATION).

There were three relevant documents which had none of the terms in the second column, but did have *TEACHER EDUCATION CURRICULUM. This was the first indication that QUERY does not require the end of the subfield to concide with the end of the retrieval key, but stops scanning once the retrieval value has been satisfied.

Four documents were retrieved from CIJE, but a manual search found one document with the proper combination of descriptors that was not retrieved -- ED 007 817 (*COLLEGE SCHOOL COOPERATION, *STUDENT TEACHING, *TEACHER EDUCATION). The four that were retrieved had all-major descriptor combinations, and in each case the descriptor from the second column above was the first one in the descriptor field.

Search 1.4 The Use of Interns in Secondary Education

Translation.

*INTERNSHIP PROGRAMS (text)	*SECONDARY SCHOOLS (text)
*TEACHER INTERNS (text)	SECONDARY SCHOOLS (text)
	*HIGH SCHOOLS (text)
	HIGH SCHOOLS (text)
	*SECONDARY SCHOOL TEACHERS (text)
	SECONDARY SCHOOL TEACHERS (text)
	*SECONDARY EDUCATION (text)
	SECONDARY EDUCATION (text)

Results. Ten documents were retrieved, with 90 percent relevance. The one irrelevant document was indexed with *INTERNSHIP PROGRAMS and *HIGH SCHOOLS and concerned internship programs for principals.

Three documents were retrieved from CIJE, but a manual search found one document with the proper combination of descriptors that was not retrieved -- EJ 001 256 (*INTERNSHIP PROGRAMS, *SECONDARY SCHOOLS). Each of the three documents retrieved in CIJE had all-major descriptor combinations, and the descriptor from the first column above was the first in the descriptor field in all cases.

Search 1.5 Characteristics of Innovative School Personnel

Translation.

*CHANGE AGENTS
CHANGE AGENTS

Results. A total of 199 documents were retrieved, with 35 percent relevance. Of 114 documents dealing with change agents in schools, 67 were relevant.

The irrelevant documents concerning change in schools used the term, change agents, to mean the students themselves, a particular method of instruction, a classroom arrangement, a test, a new curriculum, an administrative procedure, or the school itself (in society). This variability is not indexer error, since CHANGE AGENTS is defined in the original DJF as "persons, institutions, social conditions, etc. responsible for bringing about change."

Other irrelevant documents concerned change in the community (21), in higher education (24), in business organizations (3), in hospitals (1), in foreign countries (17), and in society as a whole (28).

Relevant documents, which concerned change agents in the schools and usually had some discussion of the characteristics of these change agents, were indexed also with a term containing the word "school" (25) like PUBLIC SCHOOL SYSTEMS, SCHOOL SYSTEMS, SCHOOL PERSONNEL, PUBLIC SCHOOLS, HIGH SCHOOLS, or SCHOOLS, or with a term containing the word "teacher" or "teaching" (14)

like TEACHER ROLE, TEACHERS, or TEACHING METHODS. Two of the relevant documents were indexed with INSTRUCTIONAL STAFF, and five with PRINCIPALS. There were 21 relevant documents, most of them from CIJE, which had no terms referring to school personnel.

Only five of the relevant documents had a "characteristics" term like INDIVIDUAL CHARACTERISTICS, ADMINISTRATOR CHARACTERISTICS, or TEACHER CHARACTERISTICS.

All documents retrieved from CIJE were indexed with *CHANGE AGENTS. A manual search of CIJE from July 1969 through April 1970 turned up eight documents indexed with CHANGE AGENTS (EJ 005 248, EJ 005 764, EJ 005 810, EJ 007 529, EJ 008 930, EJ 009 957, EJ 014 404, and EJ 014 172) which were not retrieved by QUERY. Another manual search confirmed that all documents indexed with *CHANGE AGENTS were retrieved. (100 percent recall on major descriptor).

In RIE retrieval there was no consistent relationship found between relevance and the occurence of major or minor descriptors. Of the 47 relevant RIE documents, 25 were indexed with *CHANGE AGENTS and 22 with CHANGE AGENTS.

The Term Usage Postings showed five documents indexed with *CHANGE AGENTS (4) or CHANGE AGENTS (1) that were not retrieved (ED 032 387, ED 032 560, ED 032 600, ED 032 647, and ED 032 763). This "gap" occurs between the second and third RIE tapes according to the hit hit.[1] The last number for question 1.5 on the hit list from the second tape is ED 032 248, and the first number for question 1.5 on the hit list from the third tape is ED 032 851.

Search 1.6 Characteristics of Innovative School Personnel

Translation.

*EDUCATIONAL CHANGE (text)
*EDUCATIONAL INNOVATION (text)
*INSTRUCTIONAL INNOVATION (text)
*ORGANIZATIONAL CHANGE (text)
*TEACHER ATTITUDES (text)
*TEACHER CHARACTERISTICS (text)
*TEACHER INFLUENCE (text)
*ADMINISTRATOR ATTITUDES (text)
*ADMINISTRATOR CHARACTERISTICS (text)

Results. Fourteen documents were retrieved, with 85 percent relevance. The two irrelevant documents were false drops which discussed teacher or administrator attitudes and educational change, but not in relation to each other.

Most of the documents retrieved were indexed with "attitude" rather than "characteristics" descriptors. In fact, there were two documents with

[1]Every time a combination of descriptors is found which satisfies one of the searches, QUERY causes the computer's printer to type one line of information. This line gives the search number, document number, author, and as much of the title as can be accomodated on the line. The record of "hits" thus produced is the "hit list."

"teacher characteristics" and "principal characteristics" in the title which were not indexed with any "characteristics" descriptor.

No documents were retrieved from CIJE, although a short manual search found one document with the proper combination of descriptors -- EJ 004 384 (*EDUCATIONAL CHANGE, *TEACHER CHARACTERISTICS).

Search 1.7 Campus Laboratory Schools. Their Function and Future

Translation.

*LABORATORY SCHOOLS (text)
*AFFILIATED SCHOOLS (text)
*EXPERIMENTAL SCHOOLS (text)

Results. Forty-eight documents were retrieved, with 42 percent relevance.

Twelve relevant and four irrelevant documents were retrieved under *LABORATORY SCHOOLS. Only two documents were retrieved under *AFFILIATED SCHOOLS, both irrelevant. Thirty documents were retrieved under *EXPERIMENTAL SCHOOLS. Eight of these were relevant, of which five had LABORATORY SCHOOLS as a minor descriptor, and 22 were irrelevant. These 22 were mostly about experimental public schools and free universities.

Ten documents were retrieved from CIJE (4 relevant and 6 irrelevant) but a short manual search found two documents with the proper descriptors which were not retrieved -- EJ 003 865 (*LABORATORY SCHOOLS) and EJ 004 052 (*LABORATORY SCHOOLS). All ten of the documents retrieved had the requested descriptor as the first one in the descriptor field.

Search 1.8 Racism in Relation to Teacher Education

Translation.

*RACISM (text)
*RACIAL SEGREGATION (text)
*RACIAL DISCRIMINATION (text)
*RACIAL ATTITUDES (text)
*TEACHER EDUCATION (text)
*PRESERVICE EDUCATION (text)
*INSERVICE TEACHER EDUCATION (text)

Results. Only two documents were retrieved, with 50 percent relevance. The irrelevant document was a description of two separate programs, one on racism and the other on teacher education.

No documents were retrieved from CIJE. A manual search confirmed that there were no CIJE documents with these combinations of descriptors.

Search 1.9 Student Participation in Teacher Preparation

Translation.

*STUDENT PARTICIPATION (text)	*STUDENT TEACHERS (text)
STUDENT PARTICIPATION (text)	STUDENT TEACHERS (text)
*POLICY FORMATION (text)	*EDUCATION MAJORS (text)
POLICY FORMATION (text)	EDUCATION MAJORS (text)
	*TEACHER PROGRAMS (text)
	*TEACHER EDUCATION CURRICULUM (text)
	*TEACHER EDUCATION (text)
	*PRESERVICE EDUCATION (text)
	*INSERVICE TEACHER EDUCATION (text)

Results. Seven documents were retrieved, with 30 percent relevance.

Of the five irrelevant documents, two were false drops concerning student participation in a specified educational program in which there was also inservice teacher education. The other three might be classified as a "indexer error." They were about training teachers in interaction process analysis, and the "student participation" seems to refer to participation in the interaction.

One document (relevant) was retrieved from CIJE, with major descriptors from both columns. The second-column descriptor, *TEACHER EDUCATION, was the first in the descriptor field. No manual check search was made.

Search 1.10 Certification Influences on School Personnel Preparation

Translation.

*TEACHER CERTIFICATION (text)

Results. Fifty documents were retrieved, of which half were relevant.

Of the 25 relevant documents, 24 had a teacher education term in addition to *TEACHER CERTIFICATION. The distribution was TEACHER EDUCATION, 18; INSERVICE TEACHER EDUCATION, 4; PRESERVICE EDUCATION, 2.

Ten of the 25 irrelevant documents had a teacher education term. These documents concerned teacher certification requirements and preparation programs in specific fields with no relationship being drawn, or discussed the effect of new types of teacher training on certification requirements (the opposite of the question for which this search was made).

The other 15 irrelevant documents discussed teacher certification alone -- evaluation procedures, changes that should be made, and numbers of teachers certified by various institutions, at certain levels, in certain subject fields, or in certain states.

Only one document was retrieved from CIJE. It had *TEACHER CERTIFICATION as the first in the descriptor field. All other documents indexed with *TEACHER CERTIFICATION (found in manual search) were not retrieved.

Search 1.11 Certification Influences On School Personnel Preparation

Translation.

*STANDARDS (text)	*TEACHER EDUCATION (text)
*CREDENTIALS (text)	TEACHER EDUCATION (text)
*PERFORMANCE CRITERIA (text)	*PRESERVICE EDUCATION (text)
*STATE STANDARDS (text)	PRESERVICE EDUCATION (text)
*TEACHER QUALIFICATIONS (text)	*INSERVICE TEACHER EDUCATION (text)
	INSERVICE TEACHER EDUCATION (text)

Results. Seventy-two documents were retrieved, with 28 percent relevance.

Analysis of retrieval by descriptors in the first column above revealed the following distribution:

*STANDARDS	12 documents, 58 percent relevance
*CREDENTIALS	0
*PERRFORMANCE CRITERIA	4 documents, 9 percent relevance
*STATE STANDARDS	6 documents, 67 percent relevance
*TEACHER QUALIFICATIONS	45 documents, 20 percent relevance

The irrelevant documents, especially those with *TEACHER QUALIFICATIONS, usually concerned general recommendations for teacher improvement in specified subject fields, most often reading or foreign languages. Some concerned standards to be set by professional organizations.

In response to the second column above, four documents were retrieved on TEACHER EDUCATION CURRICULUM instead of TEACHER EDUCATION (as in search 1.3). Of these four, one was relevant and three irrelevant. The one relevant document had *STANDARDS from the first column; the three irrelevant documents had *TEACHER QUALIFICATIONS from the first column.

No documents were retrieved from CIJE, although a short manual search found three documents with the proper combinations of descriptors. They are:

EJ 004 100 (*STANDARDS, TEACHER EDUCATION)
EJ 001 739 (*TEACHER QUALIFICATIONS, TEACHER EDUCATION)
EJ 003 928 (*TEACHER QUALIFICATIONS, *TEACHER EDUCATION).

Search 1.12 School Personnel Preparation Programs in Early Childhood Education

Translation.

KINDERGARTEN (word)	*TEACHER EDUCATION (text)
*EARLY CHILDHOOD (text)	*PRESERVICE EDUCATION (text)
*EARLY CHILDHOOD EDUCATION (text)	*INSERVICE TEACHER EDUCATION (text)
PRESCHOOL EDUCATION (text)	*PARAPROFESSIONAL SCHOOL PERSONNEL (tex
*PRIMARY EDUCATION (text)	*TEACHER AIDES (text)
*NURSERY SCHOOLS (text)	

Results. Thirteen documents were retrieved, with 85 percent relevance. The two irrelevant documents concerned teacher education and preschool education, but not in relation to each other.

One document was retrieved with KINDERGARTEN CHILDREN, but none with KINDERGARTEN. A manual search found one document -- ED 031 443 (KINDERGARTEN, *TEACHER AIDES) -- which should have been retrieved. The lack of retrieval could be because "word" was used ("word" requires a space on either end of the word, and KINDERGARTEN is immediately followed by a semi-colon).

No documents were retrieved from CIJE, although a manual search found one document with the proper combination of descriptors -- EJ 013 170 (*EARLY CHILDHOOD EDUCATION, *TEACHER EDUCATION, *KINDERGARTEN).

Search 1.13 Role of Teachers Associations in Differentiated Staff Arrangements

Translation.

*DIFFERENTIATED STAFFS (text)
*STAFF UTILIZATION (text)
*STAFF ROLE (text)
*PARAPROFESSIONAL SCHOOL PERSONNEL (text)
*TEACHER AIDES (text)
*TEACHER ASSOCIATIONS (text)
*COLLECTIVE NEGOTIATIONS (text)
*NEGOTIATION AGREEMENTS (text)
*NEGOTIATION IMPASSES (text)

Results. No documents were retrieved, but five documents were found with these descriptor combinations in response to search 1.14 (Differentiated Staffing), which is a broader version of this question. Four of these five documents were relevant to this question. Of these four, three were indexed with TEACHER ASSOCIATIONS and one with COLLECTIVE NEGOTIATION. The one irrelevant document was indexed with COLLECTIVE NEGOTIATION, but had no material on teacher associations.

Of the four relevant documents, two had major-minor descriptor combinations and two had minor-minor combinations.

Search 1.14 Questions and Answers on Differentiated Staffing: Some Key Issues

Translation.

*DIFFERENTIATED STAFFS (text)
DIFFERENTIATED STAFFS (text)
*STAFF UTILIZATION (text)
STAFF ULITZIATION (text)
*STAFF ROLE (text)
STAFF ROLE (text)

Results. Of 303 documents retrieved, 40 percent were considered relevant. A breakdown of retrieval by descriptors follows:

*DIFFERENTIATED STAFFS	30 documents,	100 percent relevance
DIFFERENTIATED STAFFS	18 documents,	94 percent relevance

*STAFF UTILIZATION	35 documents,	60 percent relevance
STAFF UTILIZATION	92 documents,	27 percent relevance
*STAFF ROLE	33 documents,	21 percent relevance
STAFF ROLE	95 documents,	19 percent relevance

Most of the irrelevant documents concerned staffs in organizations not directly involved in education, such as community agencies (17), poverty programs and Job Corps (18), child care centers (3), libraries (2), prisons (1), research and development centers (13), computer centers (2), museums (1), industry (3), regional educational laboratories (2), 4-H clubs (2), state vocational counseling centers (6), and hospitals (6).

Irrelevant documents concerning staffs in schools usually dealt with non-instructional staff (secretaries, etc.), teachers' attitudes toward their work (indexed with STAFF ROLE), or surveys of numbers of staff in various school systems within a state.

Documents retrieved from CIJE were all indexed with major descriptors. A manual search confirmed that all CIJE documents indexed with *DIFFERENTIATED STAFFS, *STAFF UTILIZATION, or *STAFF ROLE were retrieved. A short manual search found two CIJE documents indexed with STAFF UTILIZATION -- ED 001 827 and EJ 015 208 -- which were not retrieved.

A check with the Term Usage Postings showed that all RIE documents with these descriptors were retrieved except for ED 032 593, ED 032 694, ED 032 705, and ED 032 786 (STAFF ROLE) and ED 032 419, ED 032 614, and ED 032 749 (STAFF UTILIZATION). This gap occurs between the second and third file tapes, according to the hit list. The last number for question 1.14 on the hit list for the second tape is ED 032 294, and the first number for question 1.14 on the hit list for the third tape is ED 032 924.

Search 1.15 The Role of the Academic Disciplines in Teacher Education

Translation.

*GENERAL EDUCATION (text)
GENERAL EDUCATION (text)
*LIBERAL ARTS (text)
LIBERAL ARTS (text)
*ACADEMIC EDUCATION (text)
ACADEMIC EDUCATION (text)
*INTELLECTUAL DISCIPLINES (text)
INTELLECTUAL DISCIPLINES (text)
*TEACHER EDUCATION (text)
TEACHER EDUCATION (text)
*PRESERVICE EDUCATION (text)
PRESERVICE EDUCATION (text)
*TEACHER EDUCATION CURRICULUM (text)
TEACHER EDUCATION CURRICULUM (text)

Results. Sixty-two documents were retrieved, with 37 percent relevance. About half of the relevant documents were about the elementary teacher education models developed with USOE support.

Of the 38 irrelevant documents, 30 discussed liberal arts and teacher education, but with no relationship between them. Most of these were from a series of documents processed by VT and concerning education in various foreign countries. Most of them were indexed with *GENERAL EDUCATION. Of

the other eight irrelevant documents, four were about teacher training programs for liberal arts graduates, three compared various characteristics of liberal arts majors and education majors, and one concerned "preservice education" of industrial workers.

Six documents were retrieved on LIBERAL ARTS MAJORS as an expansion of LIBERAL ARTS -- further indication that QUERY does not require the end of the retrieval key to coincide with the end of the subfield. Of these six documents, two were relevant. The four irrelevant ones were part of the series on education in foreign countries.

Two documents were retrieved from CIJE, both with all-major descriptor combinations.

Search 1.16 Evaluation of Graduates of School Preparation Programs at Graduation and Inservice

Translation.

*FOLLOWUP STUDIES (text)
FOLLOWUP STUDIES (text)
*GRADUATE SURVEYS (text)
GRADUATE SURVEYS (text)
*LONGITUDINAL STUDIES (text)
LONGITUDINAL STUDIES (text)
*TEACHER EVALUATION (text)
TEACHER EVALUATION (text)
*EFFECTIVE TEACHING (text)
EFFECTIVE TEACHING (text)
*BEGINNING TEACHERS (text)
BEGINNING TEACHERS (text)
*TEACHERS (text)
TEACHERS (text)

Results. Forty-seven documents were retrieved, with 55 percent relevance. A breakdown of retrieval by descriptors in the first column above revealed the following distribution:

*FOLLOWUP STUDIES	0
FOLLOWUP STUDIES	4 documents, 75 percent relevance
*GRADUATE SURVEYS	3 documents, 100 percent relevance
GRADUATE SURVEYS	0
*LONGITUDINAL STUDIES	1 document, 100 percent relevance
LONGITUDINAL STUDIES	3 documents, 67 percent relevance
*TEACHER EVALUATION	10 documents, 90 percent relevance
TEACHER EVALUATION	14 documents, 43 percent relevance
*EFFECTIVE TEACHING	9 documents, 11 percent relevance
EFFECTIVE TEACHING	3 documents, 0 percent relevance

Irrelevant documents fell into four categories -- the effects of various aspects of the school environment on teachers' effectiveness (6), opinions on how teachers should teach (8), informal evaluation of teachers by students (3), and false drops in longitudinal or followup studies of students (3). The first two categories were usually indexed with *EFFECTIVE TEACHING or EFFECTIVE TEACHING.

Three documents were retrieved on TEACHERS COLLEGES as an expansion of TEACHERS. Of these, two were relevant. The irrelevant document was an "opinion" on how teachers should teach and be educated.

One document was retrieved from CIJE. It has an all-major descriptor combination.

Search 1.17 Role of the Professor in Teacher Education

Translation.

*TEACHER EDUCATORS (text)	*TEACHER ROLE (text)
TEACHER EDUCATORS (text)	TEACHER ROLE (text)
*CLINICAL PROFESSORS (text)	*TEACHER RESPONSIBILITY (text)
CLINICAL PROFESSORS (text)	TEACHER RESPONSIBILITY (text)
*COLLEGE SUPERVISORS (text)	*STAFF ROLE (text)
COLLEGE SUPERVISORS (text)	STAFF ROLE (text)
	*STAFF ULILIZATION (text)
	STAFF UTILIZATION (text)

Results. Twenty documents were retrieved, with 80 percent relevance.

Relevant documents were approximately evenly divided between descriptors in the second column above:

*TEACHER ROLE	3
TEACHER ROLE	3
*TEACHER RESPONSIBILITY	1
TEACHER RESPONSIBILITY	1
*STAFF ROLE	2
STAFF ROLE	2
*STAFF UTILIZATION	2
STAFF UTILIZATION	2

Of the four irrelevant documents, two were indexed with TEACHER EDUCATORS, but actually dealt with teachers. The other two were false drops in which a "teacher role" term referred to student teachers who appeared in the same indexing with college supervisors.

No documents were retrieved from CIJE.

Search 2.1 Instructional Materials

Purpose. To determine type versus content usage of descriptor.

Translation.

*INSTRUCTIONAL MATERIALS (text) (not) CENTERS (text followed by)

Results. Sixty documents were retrieved, all with the descriptor *INSTRUCTIONAL MATERIALS CENTERS.

Of these 60, 35 were from RIE. A manual search of RIE found 52 documents indexed with *INSTRUCTIONAL MATERIALS CENTERS. Assuming that QUERY is retrieving on *INSTRUCTIONAL MATERIALS CENTERS, and not *INSTRUCTIONAL MATERIALS, this constitutes 67 percent recall.

Twenty-five of the 60 documents retrieved were from CIJE. All of these had *INSTRUCTIONAL MATERIALS CENTERS as the first in the descriptor field. A manual search of CIJE found 54 documents indexed with *INSTRUCTIONAL MATERIALS CENTERS. Assuming that QUERY was retrieving on this descriptor, recall was 46 percent.

Search 2.2 Measurement Instruments and Questionnaires

Purpose. To determine type versus content usage of descriptors.

Translation.

*MEASUREMENT INSTRUMENTS (text)
*QUESTIONNAIRES (text)

Results. Of 237 documents retrieved, 124 were for *MEASUREMENT INSTRUMENTS and 113 for *QUESTIONNAIRES.

Six documents were retrieved from CIJE with *MEASUREMENT INSTRUMENTS and three documents with *QUESTIONNAIRES. Each of these nine has *MEASUREMENT INSTRUMENTS or *QUESTIONNAIRES as the first in the descriptor field. A manual search of CIJE found a total of 39 documents indexed with *MEASUREMENT INSTRUMENTS, and 28 with *QUESTIONNAIRES. This constitutes 15 percent recall for *MEASUREMENT INSTRUMENTS and 11 percent recall for *QUESTIONNAIRES in CIJE.

In RIE it was found that the descriptors have been assigned to documents to indicate one of four situations:

1. Measurement instruments or questionniares are discussed in the document in a general way, and the instruments discussed are not included. In the lists below, this type of descriptor usage is labeled C for CONTENT.
2. Measurement instruments or questionnaires are discussed specifically, such as in development of a teacher attitude inventory, but it is not possible to tell from the abstract whether or not the instrument is included. In the lists below, this type of descriptor usage is labeled C&T for CONTENT & TYPE.
3. Measurement instruments or questionnaires are the entire document. In the lists below, this type of descriptor usage is labeled T for TYPE.
4. Measurement instruments or questionnaires are used, as in a research study or program evaluation. In the lists below, this type of descriptor usage is labeled U for USE.

*MEASUREMENT INSTRUMENTS (118)		*QUESTIONNAIRES (110)	
C:	36 or 30%	C:	2 or 2%
C&T:	59 or 50%	C&T:	26 or 24%
T:	7 or 6%	T:	13 or 12%
U:	16 or 14%	U:	69 or 62%

As the lists indicate, *MEASUREMENT INSTRUMENTS has been used primarily to describe the content of a document, in which the instrument discussed is sometimes included (80 percent of all cases). *QUESTIONNAIRES was most often used to indicate methodology (62 percent of all cases), with the questionnaires themselves sometimes included.

A manual search using the Term Usage Postings to check recall in RIE found that all documents indexed with *MEASUREMENT INSTRUMENTS were retrieved except for ED 032 573, ED 032 589, ED 032 779, and ED 032 784. This gap occurs between the second and third file tapes according to the hit list. The last number on the hit list for the second tape is ED 031 755, and the first number on the hit list for the third tape is ED 032 965. For *QUESTIONNARIES the missing numbers were ED 032 635 and ED 032 761. These also were in the gap between the second and third RIE file tapes.

Search 2.3 Curriculum Guides

Translation.

*CURRICULUM GUIDES (text)
CURRICULUM GUIDES (text)
*STUDY GUIDES (text)
STUDY GUIDES (text)
*TEACHING GUIDES (text)
TEACHING GUIDES (text)
*FLES GUIDES (text)
FLES GUIDES (text)
(F) Curriculum Guide (text)

Results. Of 1,732 RIE documents retrieved, 1,320 (76 percent) were judged to be curriculum guides according to Good's definition: "a substitute for a formal course of study in which desirable content is suggested rather than prescribed; includes important goals and a variety of learning experiences, teaching aids, and evaluation techniques from which those considered best suited to a particular situation may be selected."[2] These relevant documents fell into categories indicated below with the frequencies given.

Science	146	Vocational and Technical	348
A. Courses	84	A. Courses	329
B. Units	62	B. Units	19

[2]Carter V. Good, ed. Dictionary of Education. New York: McGraw-Hill Book Company, 1969, p. 152.

Mathematics	53
A. Courses	45
B. Units	8
Language Arts	226
A. Courses	119
B. Units	147
Social Studies, History, and Economics	143
A. Courses	50
B. Units	93
Foreign Languages	36
A. Courses	36
Music and Art	20
A. Courses	12
B. Units	8
Health and Physcial Education	29
A. Courses	18
B. Units	11
General Grade Level	24
A. Preschool and Kindergarten	17
B. Elementary	5
C. Secondary	2
Special People	222
A. Retarded	77
B. Handicapped	14
C. Slow Learners	19
D. Gifed	32
E. Ethnic and Disadvantaged	80
Higher Education	19
A. Courses	19
Teacher Education	14
A. Courses	13
B. Units	1

Non-relevant documents fell into the categories indicated below with the frequencies given:

Bibliographies and lists of curriculum guides and curriculum materials	58
Descriptions of programs to develop curriculum guides; surveys of the use of curriculum guides; and general discussion of curriculum needs	138
"How to teach" tips; international relations; classroom management; and administrative considerations	78
Textbooks and other curriculum materials	49
Guides to specific things: museums, planetariums; instructional TV programs; movies	79
Study tips for students	10

Retrieval totals and relevance percentages for each descriptor are as follows:

CURRICULUM GUIDES	879 documents, 82 percent relevance
STUDY GUIDES	121 documents, 69 percent relevance
TEACHING GUIDES	714 documents, 71 percent relevance
FLES GUIDES	6 documents, 33 percent relevance
Curriculum Guides (in title)	12 documents, 83 percent relevance

A manual check using the Term Usage Postings found a considerable number of documents with the required descriptors which were not retrieved by QUERY. These are:

CURRICULUM GUIDES
- ED 032 417
- ED 032 420
- ED 032 443
- ED 032 472
- ED 032 659
- ED 032 673
- ED 032 700
- ED 032 813
- ED 032 814
- ED 032 815
- ED 032 816

STUDY GUIDES
- ED 032 421
- ED 032 496

TEACHING GUIDES
- ED 032 381
- ED 032 417
- ED 032 443
- ED 032 659
- ED 032 672

According to the hit list, these numbers fall between the second and third RIE file tapes. The last number for this question on the hit list for the second tape is ED 032 340 (*CURRICULUM GUIDES), and the first number for this question on the hit list for the third tape is ED 032 948 (*TEACHING GUIDES).

Twenty-nine documents were retrieved from CIJE -- CURRICULUM GUIDES (21), STUDY GUIDES (3), and TEACHING GUIDES (5). All of these were retrieved on major descriptors. A manual search of CIJE confirmed that all documents with *CURRICULUM GUIDES, *STUDY GUIDES, and *TEACHING GUIDES or *FLES GUIDES were retrieved. No manual search was made to determine whether CIJE contained any documents indexed with CURRICULUM GUIDES, STUDY GUIDES, TEACHING GUIDES, or FLES GUIDES (minor descriptors).

Search 2.4 Preparing School Personnel Relative to Values

Translation.

VALUES (text)
BELIEF (text)

TEACHER EDUCATION (text)
PRESERVICE EDUCATION (text)
TEACHER WORKSHOPS (text)

Results. Only one document was retrieved on this question. It was relevant. It was indexed with VALUES and TEACHER EDUCATION. This document was not retrieved in search 1.1. The only difference in the two questions is the use of the operator "text" with VALUES, instead of "word."

No documents were retrieved from CIJE.

Search 2.5 Preparing School Personnel Relative to Values

Translation.

VALUES (text)	INSTITUTES (text)	(not) SCIENCE INSTITUTES (text)
BELIEF (text)		(not) TECHNICAL INSTITUTES (text)

Results. No documents were retrieved in this search.

Search 2.6 Role of Teachers Associations in Differentiated Staff Arrangements

Translation.

PARAPROFESSIONAL SCHOOL PERSONNEL (text)	PROFESSIONAL ASSOCIATIONS (text)
TEACHER AIDES (text)	TEACHER ASSOCIATIONS (text)
	NEGOTIATION (text)
	BARGAINING (text)

Results. Only two documents were retrieved in this search, with 100 percent relevance. Both documents were retrieved on all minor descriptors.

No documents were retrieved from CIJE.

Search 2.7 Racism in Relation to Teacher Education

Translation.

RACISM (text)	TEACHER EDUCATION (text)
RACIAL ATTITUDES (text)	PRESERVICE EDUCATION (text)
RACIAL DISCRIMINATION (text)	
RACIAL FACTORS (text)	
SEGREGATION (text)	
DISCRIMINATORY ATTITUDES (text)	
RACE INFLUENCES (text)	
RACE RELATIONS (text)	

Results. Twelve documents were retrieved, with 83 percent relevance. Review of the abstracts indicated that the three irrelevant documents had nothing to do with teacher education.

Three documents were retrieved on TEACHER EDUCATION CURRICULUM as an expansion of TEACHER EDUCATION. All of them were relevant.

All of the ten documents retrieved from RIE were retrieved on all-minor descriptor combinations. The two documents retrieved from CIJE were retrieved on all-major descriptor combinations, although minor descriptors were used as retrieval keys. This was the first indication that QUERY will retrieve on major descriptors in CIJE when minor descriptors are used as retrieval keys with the operator "text". No recall percentage for CIJE could be determined.

Search 2.8 The Use of Interns in Secondary Education

Translation.

SECONDARY(text) (not)SCHOOL COUNSELORS(text followed by) TEACHER INTERNS (text)
INTERNSHIP PROGRAMS (text)

Results. Four documents were retrieved, with 75 percent relevance. The one irrelevant document was from CIJE and was indexed with *SECONDARY SCHOOL COUNSELORS and *INTERNSHIP PROGRAMS.

The three documents retrieved from RIE were all relevant and were indexed with SECONDARY SCHOOL TEACHERS. It was impossible to determine whether QUERY was rejecting documents with SECONDARY SCHOOL COUNSELORS and retrieving on other expansions of SECONDARY or whether it was just retrieving on any expansion of SECONDARY, since a manual search found that none of the documents in RIE indexed with SECONDARY SCHOOL COUNSELORS were also indexed with TEACHER INTERNS or INTERNSHIP PROGRAMS.

Search 2.9 The Use of Interns in Secondary Education

Translation.

HIGH SCHOOLS (text) INTERNSHIP PROGRAMS (text)
TEACHER INTERNS (text)

Results. One document was retrieved, with 100 percent relevance. It was retrieved on an all-minor descriptor combination.

No documents were retrieved from CIJE.

Search 3.1 Preparing School Personnel Relative to Values

Translation.

*VALUES (text)
VALUES (text)
*DEMOCRATIC (text)
DEMOCRATIC (text)
*ETHICAL (text)
ETHICAL (text)
*MIDDLE CLASS VALUES (text)
MIDDLE CLASS VALUES (text)
*MORAL VALUES (text)
MORAL VALUES (text)
*PERSONAL VALUES (text)
PERSONAL VALUES (text)
*SOCIAL VALUES (text)
SOCIAL VALUES (text)
*TEACHER EDUCATION (text)
TEACHER EDUCATION (text)
*PRESERVICE (text)
PRESERVICE (text)
*INSERVICE TEACHER (text)
INSERVICE TEACHER (text)

Results. Twenty-nine documents were retrieved, with 79 percent relevance.

Three documents were retrieved from CIJE, all with all-major descriptor combinations.

This question tested whether, when "text" is used, QUERY will retrieve on a descriptor if given only enough of the first part of the descriptor to distinguish it from similar descriptors, as it has seemed to do in previous questions by retrieving on TEACHER EDUCATION CURRICULUM when TEACHER EDUCATION was used as a retrieval key. The hypothesis seems to be confirmed by the fact that it retrieved on INSERVICE TEACHER EDUCATION when given INSERVICE TEACHER, and on DEMOCRATIC VALUES and ETHICAL VALUES when given DEMOCRATIC and ETHICAL.

Search 3.2 Preparing School Personnel Relative to Values

Purpose. To duplicate 3.1 in retrieval. The experimental variable here was the use of "prefix." It was hypothesized that "word," by requiring a space on the end of the retrieval key, was preventing retrieval on terms like DEMOCRATIC VALUES, since the word VALUES in this descriptor is immediately followed by a semicolon, not a space.

Translation.

*VALUE (prefix)	*TEACHER EDUCATION (text)
VALUE (prefix)	TEACHER EDUCATION (text)
*BELIEF (prefix)	*PRESERVICE EDUCATION (text)
BELIEF (prefix)	PRESERVICE EDUCATION (text)
	*INSERVICE TEACHER EDUCATION (text)
	INSERVICE TEACHER EDUCATION (text)

Results. Thirty-one documents were retrieved, with 87 percent relevance.

The hypothesis was confirmed by the RIE retrieval, which was exactly the same as 3.1.

CIJE retrieval included three documents that were not retrieved in 3.1. All of these were indexed with minor descriptors. One document which was retrieved in 3.1 was not retrieved in this search. It was indexed with *VALUES. This was possibly not retrieved in 3.2 because "prefix" requires a space before the retrieval key, and there are no spaces preceding the descriptors on the CIJE tapes, except for the first descriptor in the field.

Search 3.3 Algorithms

Purpose. To test whether QUERY will accept a document when the retrieval value has been satisfied and ignore anything to the right of the retrieval key.

Translation.

*ALGORITHM (text)

Results. Fourteen documents were retrieved. According to the Term Usage Postings, this is 100 percent recall for *ALGORITHMS.

Recall on the question confirms the scanning procedure.

This question was not run on the CIJE tapes.

Search 3.4 Audio Active Laboratories and Audio Active Compare Laboratories

Purpose. To test whether QUERY will search for "word" anywhere within a subfield (first, middle, or last word of a descriptor).

Translation.

ACTIVE (word)

Results. According to the Term Usage Postings, all documents indexed with AUDIO ACTIVE COMPARE LABORATORIES were retrieved, and all but one document indexed with AUDIO ACTIVE LABORATORIES were retrieved. The missing document (ED 032 801) falls within the area between the second and third RIE file tapes, from which documents have been missing in several other searches (1.5, 1.14, 2.2, 2.3).

Recall on this question indicated that QUERY does scan for "word" anywhere within a subfield. It eliminates the *position* of the word as a factor in non-retrieval on such terms as DEMOCRATIC VALUES when VALUES is used as a retrieval key with the operator "word." Confirmed is the idea that the semicolon is responsible.

This question was not run on the CIJE tapes.

Search 3.5 Blue Collar Occupations and White Collar Occupations

Purpose. Run on CIJE tapes only, to test whether subfield pattern scanning on "text" is the same in CIJE as in RIE.

Translation.

COLLAR (text)

Results. RIE subfield pattern scanning on "text" requires the beginning of the subfield to coincide with the beginning of the retrieval key. Since COLLAR is not the first word in any descriptor, when used as a retrieval key it cannot coincide with the beginning of the subfield. The fact that no documents were retrieved on this question confirms that subfield pattern scanning is the same in both RIE and CIJE and that both sets of tapes do have subfield divisions.

Search 3.6 Blue Collar Occupations and White Collar Occupations

Purpose. See search 3.5.

Translation.

COLLAR (word)

Results. Seven documents were retrieved. A breakdown of retrieval by descriptors follows:

*BLUE COLLAR OCCUPATIONS	2
BLUE COLLAR OCCUPATIONS	2
*WHITE COLLAR OCCUPATIONS	2
WHITE COLLAR OCCUPATIONS	1

This was the first time in ERIC/SP search experience that documents were retrieved from CIJE on minor descriptors.

Search 3.7 State Curriculum Guides

Translation.

*STATE CURRICULUM GUIDES
STATE CURRICULUM GUIDES

Results. Fifty-three documents were retrieved with 79 percent relevance. Most of the relevant documents (24) were curriculum guides for foreign language courses. Irrelevant documents were bibliographies of curriculum guides and curriculum materials (9), surveys of the use of curriculum guides (1), and classroom management tips (1).

Search 3.8 Depressed Areas (Geographic)

Purpose. To confirm the hypothesis that QUERY does not require the end of the retrieval key to coincide with the end of the subfield, but stops scanning once the retrieval key value has been satisfied.

Translation.

*DEPRESSED AREAS (text)

Results. Thirty-one documents were retrieved. The Term Usage Postings confirm that this is the total number of times that *DEPRESSED AREAS (GEOGRAPHIC) has been used.

Only one document was retrieved from CIJE -- EJ 006 951. A short manual search found three other documents indexed with *DEPRESSED AREAS (GEOGRAPHIC) -- EJ 000910, EJ 003 223, and EJ 003 533. The one document that was retrieved had *DEPRESSED AREAS (GEOGRAPHIC) as the first in the descriptor field.

Search 3.9 Instructional Materials

Purpose. To determine type versus content usage of descriptor.

Translation.

*INSTRUCTIONAL MATERIALS (text) (not) CENTER (prefix followed by)

Results. No documents were retrieved. The question was designed to retrieve on *INSTRUCTIONAL MATERIALS without retrieving on the expansion *INSTRUCTIONAL MATERIALS CENTERS by using the modifier "followed by."

Search 3.10 Child Labor

Purpose. Test of modifier "followed by."

Translation.

CHILD LABOR (text) (not) LAWS (text followed by)

Results. No documents were retrieved. The question was designed to retrieve on CHILD LABOR without retrieving on the expansion CHILD LABOR LAWS by using the modifier "followed by."

Search 3.11 Delinquency and Delinquency Prevention

Purpose. To retrieve on *DELINQUENCY or *DELINQUENCY PREVENTION, but not *DELINQUENCY CAUSES.

Translation.

*DELINQUENCY (text) (not) CAUSES (text followed by)

Results. Thirty documents were retrieved, all from RIE. All of them were indexed with *DELINQUENCY PREVENTION. Eight were also indexed with DELINQUENCY CAUSES, and three were also indexed with DELINQUENCY.

No documents were retrieved on *DELINQUENCY. According to the Term Usage Postings, all documents indexed with *DELINQUENCY PREVENTION were retrieved except for ED 002 894, ED 030 899, and ED 031 019. ED 002 894 is indexed with both *DELINQUENCY PREVENTION and *DELINQUENCY CAUSES, and the other two are indexed with both *DELINQUENCY PREVENTION and *DELINQUENCY. None of the documents retrieved were indexed with either *DELINQUENCY CAUSES or *DELINQUENCY.

Search 3.12 Delinquency or Delinquency Prevention

Purpose. See Search 3.11.

Translation.

*DELINQUENCY(text)	(not) CAUSE (prefix followed by)

Results. Retrieval was exactly the same as in question 3.11. The only difference between the two searches was the use of "text" in 3.11 and "prefix" in 3.12 with the word CAUSES. Retrieval seems to indicate that the special pattern of subfield scanning usually used with "text" is not used when "text" is used in conjunction with the modifier "followed by." Since CAUSES is not the first word in any descriptor, when used as a retrieval key it could not coincide with the beginning of the subfield.

Search 3.13 Delinquency or Delinquency Prevention

Purpose. To retrieve on DELINQUENCY or DELINQUENCY PREVENTION, but not DELINQUENCY CAUSES.

Translation.

DELINQUENCY (text)	(not) CAUSES (text followed by)

Results. Twenty-two documents were retrieved from RIE. Of these, fifteen were indexed with DELINQUENCY PREVENTION and seven with DELINQUENCY CAUSES. All seven of the documents indexed with DELINQUENCY CAUSES were also indexed with *DELINQUENCY PREVENTION.

According to the Term Usage Postings, all except six of the documents indexed with DELINQUENCY PREVENTION were retrieved. Of these six, five were also indexed with DELINQUENCY CAUSES and one was also indexed with DELINQUENCY. None of the documents retrieved were indexed with either DELINQUENCY CAUSES or DELINQUENCY.

Three documents were retrieved from CIJE. All of them were indexed with *DELINQUENCY PREVENTION. One was also indexed with *DELINQUENCY. A manual search confirmed that all CIJE documents indexed with *DELINQUENCY PREVENTION were retrieved.

SECTION II

OUTCOMES

Practical Implications

Since QUERY "ignores" anything within a subfield to the right of the retrieval value, it is not possible to retrieve only on one particular descriptor, when there is a longer descriptor with the same initial words. For example, when TEACHERS is used as a retrieval key, QUERY will also retrieve on TEACHERS COLLEGES. Or when TEACHER EDUCATION is used as a retrieval key, QUERY will also retrieve on TEACHER EDUCATION CURRICULUM. (See searches, 1.3, 1.11, 1.15, 1.16, 2.7)[3]

This characteristic of QUERY indicates that only enough of the first part of a descriptor to differentiate it from other descriptors need be supplied as a retrieval key. For example, the Rotated Descriptor Display of the ERIC Thesaurus indicates that PRESERVICE EDUCATION is the only descriptor with the word PRESERVICE. (The descriptors immediately before and after it are PRESERVATION and PRESIDENTS.) The word PRESERVICE can be used as a retrieval key, or, to give the computer even less to look for, PRESERVI can be used. The first seven letters of PRESERVI are the same as in PRESERVATION, but the I on the end distinguishes it from PRESERVATION. Likewise, the ERVI on the end of PRESERVI distinguishes it from PRESIDENTS. Another example is the use of INSERVICE TEACHER to retrieve on INSERVICE TEACHER EDUCATION. INSERVICE alone won't do, since there are other descriptors with that word: INSERVICE COURSES, INSERVICE EDUCATION, INSERVICE PROGRAMS, and INSERVICE TEACHING. (See searches 3.1, 3.3, 3.8)

The subfield pattern scanning characteristic means that when using "text" as a context operator, the first part of the descriptor must be used as the retrieval key. For example, the retrieval key TEACHER EDUCATION will not retrieve on *TEACHER EDUCATION or on INSERVICE TEACHER EDUCATION. QUERY would compare the T in TEACHER EDUCATION with the * in *TEACHER EDUCATION or the I in INSERVICE TEACHER EDUCATION and, finding that they are not similar, would skip to the next subfield (ERIC descriptor). So when retrieval on both major and minor descriptors is desired and "text" is to be used, the retrieval key must be stated twice, once with and once without an asterisk. (See searches 2.4, 2.6, 2.7, 2.9)

Both "stem" and "prefix" can be used to search the descriptor field in the same way that they are used to search other fields, but the context values required by "word" and "suffix" create some problems in the descriptor field. Both "word" and "suffix" require a space at the end of the retrieval key. This is no problem if the retrieval key used is *not* the last or only word in the descriptors which it represents. If it *is* the last or only word, then it is immediately followed in the file by a semicolon, not a space, and QUERY will not retrieve on that descriptor. One method of getting around

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[3]Reference is made to supporting information appearing in Section I of this report.

this problem is to slice off the last letter of a word which is to be used as a retrieval key and then substitute the context operator "prefix" for "word." This gives a retrieval value which is valid as the middle or last word of a descriptor. To be valid as the first or only word of a descriptor, it must be stated twice, once with and once without an asterisk. (See searches 1.1, 1.12, 3.2, 3.4, 3.5, 3.6)

The fact that a context value must precede the retrieval key makes retrieval in CIJE very difficult, since there is no space before each descriptor, as in RIE. The only descriptor preceded by a space in the CIJE tapes is the first one in the descriptor field. As a result, scanning is off one character to the right whenever "text" is used or whenever the retrieval key is the first part of the descriptor with "word," "prefix," "stem," or "suffix." The first character of the retrieval key is compared with the second character of the descriptor. Thus, the retrieval key TEACHER EDUCATION will retrieve only on *TEACHER EDUCATION, and the retrieval key *TEACHER EDUCATION will retrieve on *TEACHER EDUCATION only in those cases when it is the first descriptor in the field. Similarly if one used *TEACHER or TEACHER as retrieval keys with the context operator "word," there would be no retrieval on TEACHER EDUCATION, since it is never preceded by a space (major descriptors are always listed first), and only those documents in which *TEACHER EDUCATION is the first descriptor in the field would be retrieved. All documents indexed with *INSERVICE TEACHER EDUCATION or INSERVICE TEACHER EDUCATION would be retrieved, however, since TEACHER is the middle word of this descriptor and is thus preceded and followed by a space. (See searches 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.9, 1.10, 1.11, 1.12, 1.14, 2.1, 2.2, 2.3, 2.7, 2.8, 3.1, 3.2, 3.5, 3.6, 3.8)

On those questions where it could be checked, it was found that a group of documents were consistently not retrieved -- all from a certain part of RIE. This gap has been narrowed to somewhere between ED 032 340 and ED 032 851. In each question where this problem occurred, the last document before the missing group was the last entry on the hit list for the second RIE tape, and the first document after the missing group was the first entry on the hit list for the third RIE tape. This seems to indicate that part of RIE is not on the tapes or the tapes are not being run completely -- either not finishing the second or not starting the third at the beginning. This phenomenon occured in the three separate runs. (See searches 1.5, 1.14, 2.2, 2.3, 3.4)

In an attempt to retrieve on descriptors which have two- or three-word expansions without retrieving on the expansions, the following combination of operators has been used:

RETRIEVAL KEY (text) (and not) RETRIEVAL KEY (text followed by)

In only one case did QUERY retrieve on the excluded expansion. In most of the other cases it retrieved on other expansions when available, but never on the original descriptor. If no other expansion than the excluded one is available, there is no retrieval. For example, if the combination INSTRUCTIONAL MATERIALS(text) (and not)CENTERS(text followed by) is used, there is no retrieval, since INSTRUCTIONAL MATERIALS CENTERS is the only expansion of INSTRUCTIONAL MATERIALS in the ERIC Theasurus. However, if the combination DELINQUENCY(text) (and not)CAUSES(text followed by) is used, QUERY will retrieve on DELINQUENCY PREVENTION. (See searches 2.1, 2.8, 3.9, 3.10, 3.11, 3.12, 3.13)

Changes in Question Translation as Result of This Study: An Example

Given below is an example of the way experience with QUERY has affected our question translation process. The amount of computer time needed to implement a search is in part a function of the length (number of spaces) of the search statement. The data in this example indicates that learning how QUERY works can effect a significant gain in efficiency.

Original Version (tested)

*TEACHER EDUCATION(TEXT),(OR)TEACHER EDUCATION(TEXT),(OR)*INSERVICE TEACHER EDUCATION(TEXT),(OR)INSERVICE TEACHER EDUCATION(TEXT),(OR)*PRESERVICE EDUCATION(TEXT),(OR)PRESERVICE EDUCATION(TEXT),

193 spaces -- total
131 spaces -- retrieval keys

Improved Version #1 (tested)

*TEACHER EDUCATION(TEXT),(OR)TEACHER EDUCATION(TEXT),(OR)*INSERVICE TEACHER (TEXT),(OR)INSERVICE TEACHER(TEXT),(OR)*PRESERVICE(TEXT),(OR)PRESERVICE(TEXT),

153 spaces --total
91 spaces -- retrieval keys

Improved Version #2 (not tested)

*TEACHER(WORD),(OR)TEACHER(WORD),(OR)*PRESERVICE(WORD),(OR)PRESERVICE(WORD), (AND)EDUCATION(PREFIX FOLLOWED BY),

110 spaces -- total
44 spaces -- retrieval keys

Improved Version #3 (not tested)

EACHER(SUFFIX),(OR)RESERVICE(SUFFIX),(AND)EDUCATIO(PREFIX FOLLOWED BY),

71 spaces -- total
23 spaces -- retrieval keys

How To Conduct a Search With QUERY

The following is an inhouse guide to the use of QUERY, in searching the ERIC files. It was developed on the basis of our experience with QUERY.

Step 1

Separate your question into its component ideas.

Step 2

Select the ERIC descriptors for each idea. Select many; we'll cut down later.

Step 3

Arrange the descriptors for each idea into a column, so that you have one column for each idea.

Step 4

Look at this arrangement, mentally combine each descriptor in the first column, one-by-one, with each descriptor in the second column, and consider whether each one of these combinations really represents your question or whether it is likely to produce irrelevant documents. A first-column descriptor which coordinates well with the first four descriptors in the second column, may represent a different question when combined with the fifth.

Step 5

If any inappropriate combinations were found during Step 4, try moving the problem descriptor to a different column, replacing it with a different descriptor, or if none of this works, then eliminate it completely.

Step 6

Look at the descriptors in the first column to see if any of them have a word in common. If none are found, proceed directly to Step 7.

If you find a common word in two or more descriptors, look for it in the Rotated Descriptor Display of the ERIC Thesaurus to see if it is used in any descriptors other than the ones you want to use. If it is not used in any other descriptors, then select the common word as a retrieval key and proceed to Step 8.

If the common word *is* used in other, unwanted descriptors, look at each one of the unwanted descriptors and mentally combine it with each descriptor

in the second column to see if it would be likely to have been indexed together with any of them. If the unwanted descriptor is not likely to have been indexed in combination with any of the second-column descriptors, then the common word is a safe choice as a retrieval key. Proceed to Step 8.

If the unwanted descriptor *does* seem likely to have been indexed in combination with any of the descriptors in the second column, there are two possibilities: 1) maybe the combination represents your question, but you just didn't find the descriptor during Step 2; 2) maybe the unwanted descriptor hasn't been used very often. In the first case it is again safe to select the common word as a retrieval key. Proceed to Step 8.

In the second case, we go to the Term Usage Statistics and see how many times the unwanted descriptor containing the common word was used. It it wasn't used very often, it is--once again--safe to use the common word as a retrieval key. Proceed to Step 8.

If one or more of the unwanted descriptors *were* used often, then we must examine the wanted descriptors to see if the common word occupies the first position in them. If it is the first word in all of the wanted descriptors and in none of the unwanted descriptors, then it may safely be chosen as a retrieval key. Proceed to Step 8.

If it does *not* occupy the first positon in all the wanted and none of the unwanted descriptors, then we arrive at the final and hopeless possibility: an unwanted descriptor containing the common word we want to use as a retrieval key, which is likely to have been indexed together with one or more of the second-column descriptors, but this combination does not represent our question, and the unwanted descriptor has been used very often. In this case, we must simply give up and decide to use each of the wanted descriptors as a separate retrieval key, thus proceeding to Step 7.

Step 6 should be repeated for each group of descriptors in the first column which have a word in common, and then for each group of descriptors in the second column which have a word in common.

Step 7

Individually check each one of the descriptors which you have determined in Step 6 must be used as a separate retrieval key in the Rotated Descriptor Display to determine whether any one of them contains a word which is not used in any other descriptor in the thesaurus. If a word is found, then it may be selected as a retrieval key to represent the entire descriptor.

Step 8

Check each word which has been selected as a retrieval key to see what position it occupies in each descriptor it represents.

The most important thing to watch here is whether it is the last or only word in any of the descriptors. If it is the last word, then the contextual operator "prefix" *must* be used. If it is not the last or only word in any of the descriptors, then "word" should be used.

Once the decision to use "prefix" or "word" has been made, examine the group of descriptors containing the common word again to see if the common word is the first or only word in any of the descriptors in the group. If it is, then it must be stated twice, with and without an asterisk, regardless of whether "prefix" or "word" is being used as the context operator. If it is not the first or only word in *any* of the descriptors in the group, then it need only be stated once--without asterisk.

Step 9

Look up the remaining descriptors which you have determined in Step 6 must be used as a separate retrieval key in the Rotated Descriptor Display under the first word of the descriptor. These descriptors will use the context operator "text", and only enough of the beginning of the descriptor need be supplied to distinguish it from other descriptors which come before and after it in the Rotated Descriptor Display. Match the desired descriptor letter-by-letter with the descriptors immediately before and after it in the Rotated Descriptor Display and add one letter to those which it has in common with the immediately preceding and following descriptors.

These nine steps should result in a complete list of retrieval keys with accompanying context operators for each column. It then remains only to join all the retrieval keys in each column with or's and all columns with and's.

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Analyst's Summary of Impressions

The major problem with the use of QUERY is the fact that it is a generalized system. It could probably be used to search any kind of file, as stated in the program user's handbook, but would never be perfectly suited to any particular one. It also seems to be more intended for an unstructured search field like an abstract, rather than a structured field like the descriptors.

It is the structure of the descriptor field which has caused problems, plus the fact that this structure is not the same on the two sets of tapes--RIE and CIJE. The lack of a space after each descriptor on the RIE tapes and both before and after each descriptor on the CIJE tapes means that the user must be constantly thinking of which position a word occupies within a descriptor and then slicing off letters here and there to get around the fact that the descriptor field does not have the kind of spacing that QUERY requires.

If the subfield pattern scanning (which apparently was a special adaptation requested by ERIC) could be eliminated so that "text" operates in the descriptor field as in other fields, and *if* the tapes could be changed to have spaces before and after each descriptor, then QUERY would be a very easy-to-use program. Questions could be put together by any user, and the questions would not require vast amounts of computer time. Results would also be reliable, at least in terms of descriptors.

Use of QUERY in searching the RIE and CIJE tapes must be done with a good understanding of how the program works. General questions using broad terms have gotten the best results, but these questions are usually just as easily searched manually in RIE. It is the narrow or uncommon questions which could benefit the most from a computer capability, since minor descriptors are then also available. But the few documents in the system on such a topic might be just the ones not to be retrieved due to the user's lack of knowledge on the complicated process of writing a question (i.e., using "prefix" or "suffix" instead of a "word" and slicing off letters here and there). "Teacher Education in Relation to Values" (1.1, 2.4, 2.5, 3.1, 3.2) is a good example. Results were satisfactory after three attempts, during which the idiosyncrasies of program and file were learned. The 31 documents finally retrieved were very relevant to the question, but the average user might have given up after the first or second try, thinking that there was nothing on that topic in ERIC.

From a substantive point of view, the lack of man-machine interaction with this type of program is not a problem. Descriptors must be carefully selected beforehand, but this kind of careful procedure is helpful in clarifying the original question. Maximum recall while still maintaining a respectable relevance percentage is usually possible. Originally a one-level (single column) approach, with very few descriptors in that level, was often used. This gave good recall but poor relevance percentages. Another approach, using two or three levels, with many descriptors in each level, has been more successful. For this approach, though, a user needs to be able to group descriptors by using "word," "prefix," etc., and thus needs to know how to use these operators.

Users already fimiliar with the ERIC system could possibly learn to do this with the tapes and the program as they are now, and not begrudge the effort

too much. The individual clearinghouses, at least, would be able to, because of their familiarity with the Thesaurus. It is not an impossible task; it just takes much thought and effort.

Recommendations for Further Research

All the problems and possibilities involved in using the QUERY program to search the ERIC files have not been explored. Our experience with QUERY indicates that it would be useful to pursue the following questions:

1. Does the modifier, "followed by," work as described in the handbook?

2. Will QUERY search for a "followed by" retrieval key only within the same descriptor as the previous retrieval key or will it search for it anywhere within the descriptor field?

3. Does using "text" or "word" have any effect on the way that QUERY searches for a "followed by" retrieval key, given the fact that "text" usually requires scanning to begin with the first character of each subfield?

4. When using the operator, "prefix," can the semicolon at the end of the descriptor serve as a character as well as a subfield delimiter?

The ERIC Clearinghouse on Teacher Education will attempt to obtain data regarding these questions while it continues to utilize QUERY as a regular part of its information handling activities.