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STATE SUPERVISORY AND TEACHER EDUCATION PERSONNEL
IN VOCATIONAL AND TECHNICAL EDUCATION

DISSERTATION

Presented in Partial Fulfillment of the Requirements for
the Degree Doctor of Philosophy in the Graduate
School of The Ohio State University

By
John David McCracken, B.S., M.S.

The Ohio State University
1970

Approved by

[Signature]
Department of Agricultural Education
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PUBLICATIONS

"Relation of High School Vocational Agriculture to Achievement in College Courses in Agronomy," (Unpublished Master's Thesis), Iowa State University, 1962.


FIELDS OF STUDY

Major Field: Studies in Agricultural Education
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Ralph E. Bender, James W. Hensel, Richard H.
Wilson, and Ralph J. Woodin.

Major Field: Studies in Research and Statistics
Professors J. Robert Warmbod, George E.
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Minor Field: Studies in Vocational Education
Professors Aaron J. Miller, William E.
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CHAPTER I

THE PROBLEM AND ITS SETTING

Introduction

Educational research occupies a pivotal position as educators move to meet growing social challenges.¹ Because of such major social problems as poverty, urbanization, slums, population growth, juvenile delinquency and ethnic relationships and because of disproportionate unemployment in the young and non-white portion of the population, leaders have called for expansion and improvement in vocational education.² However, change must not only occur in reaction to societal pressures, but should be a logical outcome of systematic, controlled, empirical, and critical investigation. Utilization of the growing bank of research knowledge in affecting change is dependent upon increased communication between research specialists and practitioners.

Plans for improving the process of educational change


normally include linkages to increase the flow of information from design to implementation.\(^3\) Funding for dissemination and utilization of research findings in vocational education is currently provided through the Vocational Education Amendments of 1968.\(^4\) Support is included for research in vocational education, training programs for research dissemination, and demonstration and dissemination projects.\(^5\) Creation of the Office of Information Dissemination under the Office of the Deputy Assistant Secretary/Commissioner for Planning, Research, and Evaluation reflects the growing awareness within the U.S. Office of Education of the need for increasing emphasis on dissemination activities.

The Educational Resources Information Center (ERIC) Clearinghouse for Vocational and Technical Education operates by contract with the Office of Information Dissemination. This clearinghouse was developed in response to a need for an information retrieval system which would maintain a fundamental and continuing interest in collecting, retrieving, and disseminating the literature of vocational and technical education and related services. The literature includes not


only reports of basic and applied research but also mate-
rials which constitute the emerging knowledge, innovative
ideas, and other items having high current utility. Much
of this information exists as obscure materials which
often do not appear in the best usable form or are not
reported in media readily available to the greatest number
of potential users. As more and more materials are de-
veloped, improved dissemination techniques are required to
impact on the greatest number of potential users.

Problems identified by various groups within voca-
tional and technical education may serve as the basis for
development of improved information dissemination systems
and products. Research is necessary to assess information
needs and improve communication channels between research-
ers and practitioners.

If information systems are to offer a
deliberate mechanism for the diffusion of
educational ideas, factors which must receive
attention include: the identification of
user groups and their information needs, the
extensiveness of information diffusion and
the degree of penetration through various
dissemination techniques within user groups,
and feedback techniques on the effectiveness
of concepts disseminated.

---

6 Robert E. Taylor, principal investigator, "A Pro-
posal to the U.S. Office of Education for the Continuation
of the Center for Research and Leadership Development in
Vocational and Technical Education at The Ohio State

7 Celiana I. Wilson, "A Vehicle for Diffusion of
Educational Ideas," (speech delivered at the National Con-
ference on the Diffusion of Educational Ideas, Michigan
Characteristics of user populations tend to serve as constraints on an information dissemination system. Since research and development data have not been a day-to-day operational need, vocational educators are generally not trained to search out or use available information. Both the information products and the system itself must therefore be tailored to the needs and abilities of a user group which is untrained in search techniques. Concurrently, effort must be expended to educate vocational education clientele to exploit information systems.

In vocational education, little is known about major problems for which user groups need information, methods used by user groups in seeking information, information sources normally used, or the criteria employed in selecting information sources. A knowledge of these factors would provide a basis for improvement of information services and products in vocational and technical education, thereby resulting in a more effective linkage of research and practice.

**Purpose**

The central purpose of this study was to investigate factors influencing the utilization of information for problem-solving by state supervisory and teacher education personnel in vocational and technical education.
Objectives

Objectives essential to the conduct of the study were:

1. To identify differences between teacher educators and state supervisors in vocational and technical education in their utilization of information.

2. To identify relationships between frequency of literature source selection in solving work-related problems and vocational educators' perceived accessibility, ease of use, and technical content of and degree of experience with literature sources.

3. To identify major sources of information used by vocational educators in solving work-related problems.

Variables

Information source utilization by teacher educators and state supervisors was chosen as the dependent variable because the study was primarily concerned with the flow of knowledge to leadership personnel in vocational and technical education. Information source utilization was measured by the frequency of source selection in solving typical, current work-related problems.

Independent variables were identified and selected because of their visibility in the literature, because of
their utility in describing the sample, or because of their potential utility for predicting the dependent variable. State supervisory personnel and teacher educators were chosen because of their key roles in linking research to practice. Descriptive variables included measures of office location, occupational experience, age, educational level, vocational service area, and job function. Other independent variables included a classification of typical work-related problems, a recent work-related problem, stage in problem-solving, and motivation for literature search. Variables measuring perceived costs and value of literature sources were ease of use, accessibility, and technical content of literature sources, and degree of experience of the user with the literature sources.

Hypotheses

A general research hypothesis was stated for each of the three major study objectives. Supporting hypotheses under each general hypothesis represent a specific contributory key indicator for the general class of variables treated by the general research hypothesis.

Non-directional research hypotheses were stated to investigate differences between teacher educators and state supervisory personnel, and among the information sources. Directional research hypotheses were stated to investigate relationships when such relationships were adequately
Hypotheses were tested in their null form at the .05 level of significance. Failure to reject a null hypothesis was to constitute rejection of its alternative research hypothesis. Conversely, rejection of a null hypothesis constituted acceptance of its alternative research hypothesis.

**Hypothesis 1**

There is a significant difference in the information sources utilized by teacher education and state supervisory personnel in vocational and technical education.

\[ H_{11} \] Teacher educators and state supervisors in vocational and technical education differ significantly in the literature sources they utilize to solve typical work-connected problems.

\[ H_{12} \] Teacher educators and state supervisors in vocational and technical education differ significantly as to whether they conduct their own search for information or have someone else conduct a search for them.

\[ H_{13} \] Teacher educators and state supervisors in vocational and technical education differ significantly as to whether they generally read material reporting original research or research summaries and interpretations.
$H_{14}$ Teacher educators and state supervisors in vocational and technical education differ significantly as to whether their search for literature generally occurs within or outside the building where they work.

$H_{15}$ Teacher educators and state supervisors in vocational and technical education differ significantly as to whether they generally use literature from educational institutions or commercial sources.

$H_{16}$ Teacher educators and state supervisors in vocational and technical education differ significantly as to whether they generally use a library within or outside the organization for which they work.

$H_{17}$ Teacher educators and state supervisors in vocational and technical education differ significantly as to whether they generally use personal or impersonal sources of information.

$H_{18}$ Teacher educators and state supervisors in vocational and technical education differ significantly in their motivation for conducting a literature search.
Hypothesis 2

There is a significant relationship between perceived cost, quality, and experience factors and the frequency of literature source utilization in solving work-connected problems.

H$_{21}$ User perceived accessibility of a literature source is positively related to the frequency of use of the source in solving a work-connected problem.

H$_{22}$ User perceived ease of use of a literature source is positively related to the frequency of use of the source in solving a work-connected problem.

H$_{23}$ User perceived technical content of a literature source is positively related to the frequency of use of the source in solving a work-connected problem.

H$_{24}$ User perceived degree of experience in using an information source is positively related to the frequency of use of the source in solving a work-connected problem.

Hypothesis 3

Significantly different literature sources are used in resolving different types of work-related problems.

H$_{31}$ Major problems generally encountered in connection with a person's work are
significantly related to the literature sources generally utilized.

H₃₂ In searching for specific information, the literature sources utilized are significantly related to the type of problem needing resolution.

H₃₃ The type of problem is significantly related to whether the user obtains the needed information through a literature search.

H₃₄ The stage in problem-solving in which users are most likely to seek information is significantly related to the literature sources generally utilized.

Assumptions, Delimitations, Limitations

Assumptions

Basic assumptions accepted by the investigator at the outset of the study included:

1. That the Havelock theory concerning the linkage of research to practice is valid.

2. That state supervisory personnel and teacher educators fulfill a linkage role.

3. That perceptions of state supervisory personnel and teacher educators are valid indications of actual practice.


**Delimitations**

The study was delimited by the following general boundaries:

1. The seven states chosen for the study were Arizona, Colorado, Florida, Michigan, Missouri, New Hampshire, and North Carolina.


3. The time period was the point in time at which the mailed questionnaire was completed.

**Limitations**

The limitations of the study were largely those of sampling, questionnaire response rate, levels of measurement, and the techniques of analysis required by measurement levels.
Definition of Terms

In order to provide clarification of certain terminology used throughout the study, the following definitions were formulated:

Accessibility of information is defined as the "obtainability" or the ease of securing a source.

Degree of experience in using an information source is defined as the frequency of information source use during the past two years of an individual's professional career.

Ease of use of information is defined as the simplicity of utilizing an information source once it has been obtained.

Impersonal sources of information are primarily literature sources. They are defined as sources other than those requiring contact with people for the transfer of information.

Information is defined as the documentary intelligence or knowledge needed or perceived to be helpful in resolving a problem.

Literature sources are defined as classifications of written works containing information.

Motivation for a literature search is defined as the reason or inducement to seek information from the literature.
Personal sources of information are primarily non-literature sources. They are defined as sources requiring interaction among people for the transfer of information.

Technical content of an information source is defined as the reliability and usefulness of the information contained within an information source.

User is defined as a person who utilizes information sources.

User groups are defined as relatively homogeneous professional audiences who utilize information sources to resolve problems common to members of the group. Primary user groups for this study were teacher educators and state supervisors in vocational and technical education.

Procedure

The central purpose, specific objectives, and hypotheses dictated the design and conduct of the study. In order to collect and analyze the necessary data, it was necessary to determine the population for the study, develop an instrument and procedure for data collection, and determine methods of data analysis.

Population and Sample

The target population for the study consisted of teacher education and state supervisory personnel in vocational and technical education. Seven states were eliminated
from consideration because of a pilot Research Coordinating Unit (RCU) effort in cooperation with The Center for Vocational and Technical Education. This effort involved administration of a questionnaire during the same general time period to the same target population, for the development of state vocational-technical education dissemination systems. Seven other states and four alternates were purposively selected to optimize geographic representation and to include states with varying size staffs of teacher educators and state supervisors. Permission was obtained from the State Director of Vocational Education in six states in the primary sample and from one alternate state. The sample consisted of the 148 state supervisors and the 141 teacher educators in seven states.

Instrument Development

A need for description of individuals in the sample and hypotheses developed for the study served as the basis for construction of a mail questionnaire. A tentative draft of the questionnaire was field tested by twenty-four subjects. The subjects for this trial consisted of vocational teacher educators at The Ohio State University and research associates and senior staff of The Center for Vocational and Technical Education, most of whom had experienced recent teacher education or state supervisory duties. This group was requested to accomplish four tasks: (1) complete the questionnaire,
(2) record the time required, (3) make marginal notes concerning questions not completely understood, and (4) list suggestions for improvement of the instrument. To reduce the length of the instrument and increase the rate of response, Part II of the instrument was administered in two forms. Form A was used to collect paired comparison ratings on accessibility and technical content, and Form B was used to collect ratings on ease of use and degree of experience. Forms were randomly assigned to subjects. The instrument was revised and lithographed in an eight-page booklet (Appendix A).

Data Collection

The initial mail contact with subjects in the study consisted of the questionnaire, a cover letter (Appendix B), a self-addressed envelope, and a response card. Questionnaires were mailed between March 10 and March 16, 1970. The first followup letters (Appendix C), including another questionnaire with a cover letter and a self-addressed envelope, were mailed March 25 and March 27. On April 4, a second followup, consisting of an individually typed postal card, was sent. A response rate of 80 per cent was obtained by the April 13 cut-off date. The response rates for the seven states varied from 72 to 86 per cent; state supervisor response rate by state varied from 68 to 87 per cent with a mean of 75 per cent; teacher educator response
rate by state varied from 80 to 94 per cent with a mean of
85 per cent.

**Data Analysis**

Treatment of the data was accomplished through a
description of the sample, analysis of data presented in
contingency tables, and linear regression. The
questionnaire responses were coded and analyzed through use
of The Ohio State University Computer Center.

**Sample Description** - Variables describing the sample
were tabled and summarized with descriptive statistics when
appropriate. The decision was made to present most of the
data for description of the sample as frequencies and per­
centages of grouped response levels. No data were presented
which would have revealed individual states.

**Contingency Tables** - Two-way frequency and percentage
tables were developed to test null hypotheses relating to the
significance of difference between variables and to depict
relationships. Chi-square was selected as the appropriate
statistical test.

When the data of research consist of
frequencies in discrete categories the $X^2$ test
may be used to determine the significance of
differences between two independent groups.
The measurement involved may be as weak as
nominal scaling.
The hypothesis under test is usually
that the two groups differ with respect to
some characteristic and therefore with respect
to the relative frequency with which group
members fall in several categories. To test
this hypothesis, we count the number of cases
from each group which fall in the various categories, and compare the proportion of cases from the other group.  

Chi-square was computed by the formula:\(^9\)

$$X^2 = N \sum_{i,j} \frac{n_{ij}^2}{n_{i}.n_{.j}} - N$$

Where

\[N = \text{total number of observations in the table.}\]
\[n_{ij} = \text{table entry for row } i, \text{ column } j.\]
\[n_{i.} = \sum_j n_{ij} = \text{row total}\]
\[n_{.j} = \sum_i n_{ij} = \text{column total}\]

The contingency coefficient \(C\) was selected as a measure of the extent of association or relation between two sets of variables when the chi-square was found to be significant.

The contingency coefficient is an extremely useful measure of association because of its wide applicability. The contingency coefficient makes no assumptions about the shape of the population of scores, it does not require underlying continuity in the variables under analysis, and it requires only nominal measurement of the variables. Because of this freedom from assumptions and requirements, \(C\) may often

---


be used to indicate the degree of relation between two sets of scores to which none of the other measures of association ... is applicable. 10

The contingency coefficient was computed by the formula: 11

\[ C = \left( \frac{X^2}{N + X^2} \right)^{1/2} \]

Linear Regression - It was an objective of this study to relate the variables of ease of use, accessibility, technical quality, and degree of experience of the sample with information sources with the frequency of information source selection to solve a current work-connected problem. The independent variables were scaled for teacher education and state supervisory personnel in each state by the method of paired comparisons. 12 These scale values were then utilized as the raw data in the BMD02R program 13 which yielded, among other things, means, standard deviations, a correlation matrix, a multiple correlation coefficient, a coefficient of determination, an analysis of variance table, and the regression coefficients.

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10 Sidney Siegel, *op. cit.*, p. 201.
CHAPTER II

REVIEW OF LITERATURE

Rationale

The Flow of Knowledge

Vocational and technical educators utilize information gained through past experiences, interpersonal communication, and literature in meeting and seeking solutions to everyday problems. Recognition of a need for information is the first step in the internal problem-solving cycle illustrated by Havelock (Figure 1).\(^1\) Problem resolution might involve articulation of the problem, search for problem solution, choice of a solution, and application of a solution. The resources available to vocational educators as they seek solutions to their practical problems will have impact on future program quality.

Many sources have contributed to the current body of knowledge which may be tapped by vocational educators. Educational research is one source. Others include textbooks in educational procedures and methods, scholarly journal articles, and other sources.\(^1\)

---

Figure 1. The Internal Problem-Solving Cycle
and serendipitous discoveries by inventive administrators and teachers.

Knowledge, to have much value, must at some time move from the minds of the individuals responsible for its existence to the minds of those responsible for its utilization. Such movement is usually referred to as the "flow of knowledge," and often there is an intermediary aiding in the movement.15

**Linking Research and Practice**

The greatest breakdown in existing information techniques occurs in the transfer of information to the practitioner.16 The practitioner or user needs three things to tap the reservoir of knowledge: a knowledge of the reservoir, access to the reservoir, and a diagnosis of his need or problem.17 The reservoir is often not utilized as it should be because of these three necessary factors. In addition, research and development efforts are seldom in a form that can be applied directly in the schools.18

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18 Coney, op. cit., p. i.
Therefore, for knowledge to flow from its source to its application, it must be repackaged and conveyed through various linkers and linkage mechanisms.

Users of educational knowledge are a broad and diverse group. The linker can choose to interact with users through periodicals, mass media, conferences, direct mailings, direct contact by visits to schools, and by informal, interpersonal channels of communication. 19

Because the flow of knowledge is usually not direct from its source to its application, intermediary roles emerge to affect the transfer. Roles illustrated in Figure 2 20 include that of packager, conveyor, consultant, and leader. These linkers not only enhance the flow of knowledge, but also serve as filters in that they select that which will be transmitted to their client system.

Groups with a Linkage Role

In vocational and technical education, the flow of knowledge from its source to its application is believed to be influenced by state supervisory and teacher education personnel. The study centers on the state level of the vocational and technical program because this level is believed to be crucial to change. Brickell observed:

The State Department of Education exerts a powerful influence on educational change in local schools. In some ways the Department is an active stimulus; in other ways it is a

19Farr, op. cit., p. 2.

20Havelock, Dissemination and Translation Roles.
Figure 2. The Linkage of Research Knowledge and the User
serious barrier. . . . Thus the posture of the Department toward innovation in general and toward innovations in particular is of great import.  

Schroeder concluded that teachers, administrators, and supervisors perceived the role of state supervisor as "stimulator."  

"State divisions of vocational education staffs have been viewed as the most crucial segment of a state's leadership population," and will remain a primary target population of The Center for Vocational and Technical Education.  

Teacher educators interact with teachers primarily in their pre- and in-service education role.

Administrators of teacher educators, teacher educators, and supervisors of teachers receive priority attention . . . [in Center research efforts] due to the ripple effect created by striving to increase the effectiveness and efficiency of instruction.

"The two primary audiences for Center products are vocational and technical teacher educators, and leaders of vocational and technical education within the states."  

---


State supervisors and teacher educators in vocational and technical education act as consultants, teachers, stimulators, information filters, and conveyors (Figure 2) in linking the existing body of knowledge to practical application resulting in improvement of local programs and better teaching and learning in schools.

Successful linkage of teacher educators and state supervisors with various sources of knowledge must occur if these personnel are to communicate knowledge effectively to vocational teachers for improvement of learning by students.

Seeking and Using Information

People normally use various personal and impersonal communication channels in searching for information.

The search for information is more highly ordered following problem identification than before, and search proceeds in a hierarchical order from more to less accessible information sources.\(^2^6\) Engineers in research and development firms have been found to select information channels in a manner intended to minimize the loss of time and effort rather than maximize the gain in terms of

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quality information. The probable eventualities were estimated; then a path of least average rate of work was chosen. Ideas were selected or rejected on merit even though information source selection followed a law of least effort. The type of problem influenced the specific information sources selected. Factors of accessibility and ease of use have been shown as more potent variables than technical quality in information source selection by Gerstberger and Rosenberg in industrial research and development.

Literature was more highly utilized in industrial research and development for idea generation, but personal communication was more highly utilized for problem definition. People concerned with generating new knowledge were more likely to seek information from impersonal


sources, while those concerned with application of knowledge were more likely to use personal sources. As teacher educators and state supervisors identify problems, alternative solutions may be obtained by utilizing a variety of information sources. One of these sources might be the services of an information system such as the Educational Resources Information Center (ERIC), the ERIC Clearinghouse for Vocational and Technical Education, or a state Research Coordinating Unit (RCU). The degree to which information systems are used might relate to the accessibility, ease of use, and technical content of information within the system as perceived by the system's target population. A knowledge of the needs of prime user groups can facilitate the development of services and products with wide acceptability.

Improved information utilization would result from packaging data useful in decision-making in a variety of ways, with information specialists taking an active role in educating potential users to information resources.

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31 Richard S. Rosenbloom, and Francis W. Wolek, Technology, Information, and Organization: Information Transfer in Industrial Research and Development, (Boston: Harvard University, Graduate School of Business Administration), pp. 6, 8.

Factors Influencing Information Channel Utilization

The information needs of research and non-research personnel in industrial and government environments were examined by Rosenberg\textsuperscript{33} to determine the attitudes of individuals towards information-seeking and the effect of the individuals' organizational status on these issues. The three hypothetical situations concerned research for a proposal, research for a journal article, and research on work being done in a particular field. No attempts were made to discover what a subject felt he would actually do or what a subject actually does in a given situation, because in reviewing literature, it was concluded that asking the subject for opinions concerning information-gathering behavior yielded data as meaningful as the data from observation studies, providing the sample size is sufficiently large.\textsuperscript{34} Ease of use of an information-gathering method was more important than the amount of information expected, regardless of the research orientation of the users. Ease of use was further defined as the time, cost, and intellectual effort in seeking information.

\textsuperscript{33}Rosenberg, op. cit.

\textsuperscript{34}Ibid., p. 18.
Gerstberger\textsuperscript{35} gathered data from nineteen engineers in two divisions of a large industrial firm over a fifteen-week period utilizing the Massachusetts Institute of Technology Solution Development Record. Each engineer reported on two information sources each week. They also ranked the information channels employed in the study, on the factors of accessibility, ease of use, technical quality, and degree of experience. Frequency of use was the dependent variable. A Kendall's Tau analysis revealed accessibility as the single most important criteria. The perception of accessibility was influenced by the degree of experience of the user with the channel.

Ideas for industrial research and development projects are filtered by real and perceived time and cost constraints in addition to an examination of their congruence with goals and needs of the organization (Figure 3).\textsuperscript{36} This model can also be applied to the search for information. Many information sources are available to vocational educators. Needs and goals of the university or state department as perceived by the educator, and real and perceived time and cost constraints, influence the sources actually utilized.

\begin{flushright}
\textsuperscript{35}Gerstberger and Allen, \textit{op. cit.}
\end{flushright}

\begin{flushright}
\textsuperscript{36}N. R. Baker, J. Siegmann, and A. H. Rubenstein, \textit{op. cit.}, p. 156.
\end{flushright}
Figure 3. The Filtering of Ideas
Three research projects were summarized by Allen to arrive at the following conclusions:

1. The selection of information sources is clearly a function of the phase in the problem-solving process.

2. Significant differences among projects appear to be largely attributable to the project's position in the spectrum from research to development.

3. Functions related to development rely little upon literature or sources outside the laboratory.

4. Research projects rely upon published literature almost to the exclusion of any other source.

5. When a project begins, there is a rather intense period of information collection (literature search). Another cycle (outside sources) follows later as problems arise.

6. In at least one case, the better performing group spent a greater proportion of their effort in gathering information.

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In a Department of Defense user study, the scientific and technical information needs of 1500 scientists and engineers from 73 companies, 8 research institutes, and 2 universities were characterized. Interviewers asked 63 questions concerning the flow of scientific and technical information inherent in satisfying these needs. Recommendations to bridge the information gap included: (1) reorienting users and information systems to become active seekers and active providers, (2) expansion of the information base to include more than research information (production and operations information), (3) restructuring of the information base with less formal information, (4) selective organization and analysis of the information, and (5) extension of the system into the work environment of users.

A descriptive analysis of data collected from 2000 engineers and scientists in 13 establishments of 4 corporations and from 1200 members of the Institute of Electrical and Electronic Engineers was completed under a National Science Foundation grant. Instances of information transfer were the dependent variable. Informal sources of information in organizations were most used. New knowledge was

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39 Rosenbloom, *op. cit.*
tapped from outside sources and operational problems were solved within the organization.

**Information Utilization in Education**

In a study of information transfer in educational research, 126 people representing 52 institutions in 22 states were interviewed. The sample was classified as university faculty with U.S. Office of Education grants, and information specialists. Recommendations included: (1) a funded trip to an Educational Resources Information Center (ERIC) clearinghouse for information gathering as a part of each U.S. Office of Education contract, (2) quality control for more efficient literature review, (3) selective dissemination to assist groups of users with recognized information needs, (4) promotion of condensed versions of reports, and (5) utilization of ERIC centers to circumvent the two-year delay between inception and publication.

Dreyfus cited examples of significant findings from research studies of learning from media that had been ignored or overlooked by producers of instruction television. He recommended greater accessibility of research findings.

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publishing of bibliographies, and utility-oriented research to improve the utilization of research knowledge by practitioners.

In a California study, it was found that existing techniques seem to be reasonably adequate for processing, filing, and storage of information. Areas of indexing and reformulation exhibited significant weaknesses, while the greatest breakdown occurred at the user interface. Needs and problems suggested three responses: (1) training and support of information specialists, (2) preparation, production, and distribution of interpretive summaries on subject areas of major interest, and (3) preparation of annual reviews of research and development.

Auerbach Corporation was charged with the responsibility to develop an information service to fulfill the requirements of those whose concern is with education on the primary and secondary school level. The study revealed that the information systems upon which educators rely are experience, personal contact, meetings, professional journals, and seminars. The results for educators are not markedly different than studies with scientists and engineers. In a Department of Defense study only five percent used libraries

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42 Coney, op. cit., p. ii.

and formal information systems. The other ninety-five percent relied on professional experience, their colleagues, personal files, departmental files and the local environment, in that order. \(^4\text{4}\)

"Our study has revealed that if information systems are to be widely used by the members of the educational community they will have to be amenable to the desires of the user.\(^4\text{5}\)

Rittenhouse\(^4\text{6}\) reported a Stanford University study of seventy-six local school districts. Major findings relating to information utilization were:

1. The most frequently used information sources are colleagues in one's own school system, principals and vice principals, contacts at professional meetings, superintendents, and curriculum specialists. Generally, these are sources close to home.

2. Communications modes tend to be informal, either with colleagues in one's own system or in other school districts.

3. Important problems in the utilization of educational information included interpreting statistical results of studies as a basis for adoption; understanding procedures for using information systems; and obtaining precise, structured information from school systems where change is occurring.\(^4\text{7}\)

\(^4\text{4}\)Ibid, pp. 6-7.

\(^4\text{5}\)Ibid, p. 9.


\(^4\text{7}\)Ibid, p. 7.
Methodology

Classification of Literature Sources

The objectives of the study dictated development of a classification of literature sources. Rosenberg\textsuperscript{48} used the following information sources to examine information-gathering in industrial and government environments:

1. Search personal library.
2. Search material in building where you work.
3. Visit knowledgeable person (twenty miles away or more).
4. Use library outside organization.
5. Consult reference librarian.
6. Visit knowledgeable person nearby (within organization).
7. Write a letter requesting information from a knowledgeable person (twenty miles away or more).
8. Telephone a knowledgeable person who may be of help.

Technical information channels used by Gerstberger\textsuperscript{49} in a study of research and development engineers were:

1. Literature
2. Vendors

\textsuperscript{48}\textsuperscript{48} Rosenberg, \textit{op. cit.}
\textsuperscript{49}\textsuperscript{49} Gerstberger, \textit{op. cit.}
3. Customer
4. External Sources
5. Technical Staff
6. Company Research
7. Group Discussion
8. Experimentation
9. Other Division of the Company.

Because this study was primarily concerned with utilization of literature, a taxonomy of written materials was sought. A classification by Barhydt and Schmidt\(^5\) was adapted. The following "sub-subfacets" were selected from the "subfacet" of printed materials, publications, and source materials:

1. Books
2. Dissertations, Theses, Reports, Monographs
3. Journals, Newsletters, Periodicals
4. Review and Interpretation Papers
5. Guidebooks, Manuals, Handbooks

**Classification of Work-Connected Problems**

Work-related problems were classified according to the categories used in *Abstracts of Research and Related*

Materials in Vocational and Technical Education (ARK). 51

Administration and Supervision - concerns program planning, program development, program administration, advisory committees, and experimental, pilot, and demonstration projects.

Employment and Occupations - concerns manpower needs, development, and utilization; employment qualifications, patterns, projections, opportunities, and trends; labor force and labor market; educational needs and opportunities; labor economics; and employment statistics supporting needed vocational education programs for specific occupational categories.

Facilities and Equipment - concerns educational facilities and equipment.

Curriculum and Instructional Materials and Devices - concerns curriculum research and development, and instructional materials and devices.

Individuals with Special Needs - concerns individual characteristics, educational needs, and programs for physically handicapped, emotionally disturbed, and socially, culturally, economically, and educationally disadvantaged groups.

Philosophy and Objectives - concerns educational philosophies, roles, and objectives for vocational and technical education programs and related fields.

51ERIC Clearinghouse for Vocational and Technical Education, ARM, (Columbus: The Ohio State University, Winter 1969).
Research and Evaluation - concerns evaluation and measurement of students and programs, research efforts and needs, research coordinating unit activities, educational change, research design, research methodology, research utilization, and research reporting.

Students, Guidance, and Personnel Services - concerns vocational counseling, occupational guidance, occupational choice, occupational and educational aspiration, career and employment opportunities, career planning, occupational information, student characteristics, and student organizations.

Teaching and Learning - concerns teaching methods and the learning process.

Teachers and Teacher Education - concerns teacher education, teacher characteristics, teacher employment, and teacher evaluation.

Analysis of Relationships Among Cost, Value, and Use Factors

In an attempt to measure the relative costs and value associated with the use of nine information channels, Gerstberger\(^5^2\) related frequency of channel use to factors of ease of use, accessibility, technical quality, and degree of experience. The Kendall Tau and Kendall Tau (partialed) statistics were used to partition variance. Because subjects were asked to rank order the channels, an ordinal statistic

\(^5^2\)Gerstberger, op. cit., p. 272.
was necessary.

Subjects in this study rated the sources on cost, value, and use factors by the method of paired comparisons. 53 "The score obtained by this method is regarded as a linear transformation of the subject's position on the psychological continuum on which the original statements were scaled." 54 Thus, assumption of interval measurement on a linear scale for each factor enabled selection of linear regression as the appropriate analysis to test relationships between the cost, value, and use variables with the frequency of literature source utilization in solving a work-connected problem.

Summary

Rationale

Knowledge, to have much value, must at some time move from the minds of those responsible for its existence to the minds of those responsible for its utilization. Various linkers and linkage mechanisms facilitate the flow of knowledge. In vocational and technical education, this information flow is believed to be influenced by state supervisors and teacher educators. Successful linkage of teacher educators and state supervisors with various sources of information must occur if these personnel are to successfully


54 Ibid., p. 50.
communicate knowledge to vocational teachers for improvement of instructional programs.

In industry, engineers have been found to select information sources in a manner intended to minimize loss of time and effort rather than maximize the gain in terms of quality information. Literature was more highly utilized for generation of ideas than for determining applications of ideas. A knowledge of the information-seeking behavior of prime user groups can facilitate the development of services and products with wide acceptability.

Information Utilization

In industry and government environments, the time, cost, and intellectual effort required in seeking information were more important criteria than the amount of information expected. The perceived needs and goals of the organization, and real and perceived time and cost constraints, directly influenced the information sources which were actually utilized.

The selection of information sources was a function of the phase in the problem-solving process. Functions related to development relied little upon literature, but research projects relied upon published literature almost to the exclusion of other sources. There was an intense period of information collection at the beginning of a project with another cycle following later as problems arose. In at least one case, the better performing group spent a greater
proportion of their effort in gathering information.

Some ways the information gap may be bridged include selection organization, condensation, and analysis of the information and extension of the information system into the work environment of users. In general, new knowledge was tapped from sources external to the organization. Educators generally relied on personal information sources and conducted searches on an informal basis. Information systems and sources must be made amenable to the desire of the users if they are to achieve wide utilization by the profession.

Methodology

The objectives of the study dictated development of a classification of literature sources. The classification adopted was one in which printed materials, publications and source materials were grouped as: (1) books, (2) dissertations, theses, reports, monographs, (3) journals, newsletters, periodicals, (4) review and interpretation papers, (5) guidebooks, manuals, handbooks, and (6) bibliographies, indexes, catalogs.

Work-related problems were classified as: (1) administration and supervision, (2) employment and occupations, (3) facilities and equipment, (4) curriculum and instructional materials and devices, (5) individuals with special needs, (6) philosophy and objectives, (7) research and evaluation, (8) students, guidance, and personnel services, (9) teaching and
learning, and (10) teachers and teacher education.

Because the method of paired comparisons was used to scale factors influencing literature source selection, interval measurement was assumed and linear regression was selected as the appropriate statistical technique.
CHAPTER III

FINDINGS

The central purpose of the study was to investigate factors influencing the utilization of information for problem-solving by state supervisory and teacher education personnel in vocational and technical education. In order to present findings relative to the central purpose and objectives, it was necessary to describe the sample, test the hypotheses, and examine relationships among variables of interest.

Characteristics of the Sample

The sample of the study was composed of state supervisory and teacher education personnel in vocational and technical education in seven states. Of 289 identified for the sample, usable responses were obtained from 230 or 80 per cent. A sample of non-respondents was interviewed by telephone. The respondents were described in the present section by means of frequency and percentage distributions of responses to items in the study questionnaire. The latter portion of this section compares the study respondents and non-respondents.
Description of Respondents

Data presented in Table 1 give the vocational service area of teacher educators and state supervisors. The service areas of trade, industrial, technical, and health occupations education and of business and distributive education were grouped due to the number of respondents with overlapping duties in these areas. Inspection of this table reveals that 24.8 per cent of the sample were in agricultural education, 18.7 per cent were in business and distributive education, 21.3 per cent were in home economics education, 27.8 per cent were in trade, industrial, technical, or health occupations education.

<table>
<thead>
<tr>
<th>Vocational Service Area</th>
<th>Teacher Educators</th>
<th>State Supervisors</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Agriculture</td>
<td>29</td>
<td>24.8</td>
<td>28</td>
</tr>
<tr>
<td>Business and Distributive</td>
<td>24</td>
<td>20.5</td>
<td>19</td>
</tr>
<tr>
<td>Home Economics</td>
<td>25</td>
<td>21.4</td>
<td>24</td>
</tr>
<tr>
<td>Trade, Industrial, Technical, Health</td>
<td>33</td>
<td>28.2</td>
<td>31</td>
</tr>
<tr>
<td>General</td>
<td>6</td>
<td>5.1</td>
<td>11</td>
</tr>
<tr>
<td>Total</td>
<td>117</td>
<td>100.0</td>
<td>113</td>
</tr>
</tbody>
</table>
and 7.4 per cent were not classified in a specific vocational education service area. Even though 92.6 per cent of the respondents were classified in a service area, many had duties which extended across the vocational service areas.

The office location of respondents is shown in Table 2. Of the 112 state supervisors who responded to this item, 101 were located with their state department of education. Of the 113 teacher educators who responded to this item, 110 were located with a college or university. One of the 110 teacher educators was located in a private college, with the other 109 located in state institutions.

**TABLE 2**

**OFFICE LOCATION OF TEACHER EDUCATORS AND STATE SUPERVISORS**

<table>
<thead>
<tr>
<th>Office Location</th>
<th>Teacher Educators</th>
<th>State Supervisors</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>State Dept. of Education</td>
<td>2</td>
<td>1.8</td>
<td>101</td>
</tr>
<tr>
<td>College or University</td>
<td>110</td>
<td>97.4</td>
<td>2</td>
</tr>
<tr>
<td>Detached Location</td>
<td>1</td>
<td>0.9</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td>113</td>
<td>100.0</td>
<td>112</td>
</tr>
</tbody>
</table>

Table 3 presents the years of experience of respondents in teacher education and state supervision.
Inspection of the data reveals that teacher educators in the sample had experienced longer tenure than state supervisors. Nearly 70 per cent of the state supervisors had less than ten years experience, and over 52 per cent of the teacher educators had eleven years or more of experience.

TABLE 3
YEARS EXPERIENCE IN TEACHER EDUCATION AND STATE SUPERVISION

<table>
<thead>
<tr>
<th>Years Experience</th>
<th>Teacher Educators</th>
<th>State Supervisors</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>1 - 5</td>
<td>28</td>
<td>23.9</td>
<td>44</td>
</tr>
<tr>
<td>6 - 10</td>
<td>25</td>
<td>23.9</td>
<td>15</td>
</tr>
<tr>
<td>11 - 15</td>
<td>15</td>
<td>12.8</td>
<td>9</td>
</tr>
<tr>
<td>16 or more</td>
<td>46</td>
<td>39.3</td>
<td>25</td>
</tr>
<tr>
<td>Total</td>
<td>117</td>
<td>100.0</td>
<td>113</td>
</tr>
</tbody>
</table>

A fairly even distribution of frequencies of ages of respondents was reported. The array in Table 4 reveals the only major difference as a higher percentage of state supervisors in the 30 to 39 age range and a higher percentage of teacher educators in the 40 to 49 age range. Over 96 per cent of the sample was over 30 years of age.

Large differences between the two groups were noted in their level of professional preparation. These data are in Table 5. The mode level of professional
TABLE 4
AGE OF TEACHER EDUCATORS AND STATE SUPERVISORS

<table>
<thead>
<tr>
<th>Age in Years</th>
<th>Teacher Educators</th>
<th>State Supervisors</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>29 or less</td>
<td>4</td>
<td>3.4</td>
<td>4</td>
</tr>
<tr>
<td>30 - 39</td>
<td>18</td>
<td>15.4</td>
<td>32</td>
</tr>
<tr>
<td>40 - 49</td>
<td>44</td>
<td>37.6</td>
<td>32</td>
</tr>
<tr>
<td>50 - 59</td>
<td>35</td>
<td>29.9</td>
<td>27</td>
</tr>
<tr>
<td>60 or more</td>
<td>16</td>
<td>13.7</td>
<td>18</td>
</tr>
<tr>
<td>Total</td>
<td>117</td>
<td>100.0</td>
<td>113</td>
</tr>
</tbody>
</table>

TABLE 5
PROFESSIONAL PREPARATION OF TEACHER EDUCATORS AND STATE SUPERVISORS

<table>
<thead>
<tr>
<th>Highest Educational Level</th>
<th>Teacher Educators</th>
<th>State Supervisors</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Bachelor's or Less</td>
<td>0</td>
<td>0.0</td>
<td>5</td>
</tr>
<tr>
<td>Bachelor's Degree Plus</td>
<td>0</td>
<td>0.0</td>
<td>12</td>
</tr>
<tr>
<td>Master's Degree</td>
<td>5</td>
<td>4.3</td>
<td>20</td>
</tr>
<tr>
<td>Master's Degree Plus</td>
<td>29</td>
<td>24.8</td>
<td>75</td>
</tr>
<tr>
<td>Doctoral Degree</td>
<td>83</td>
<td>70.9</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>117</td>
<td>100.0</td>
<td>113</td>
</tr>
</tbody>
</table>
preparation for teacher educators was the doctoral degree, and the mode level for state supervisors was the master's degree with some additional course work. No teacher educators had less than a master's degree, but 15 per cent of the state supervisors had not obtained a master's degree.

The major job functions of teacher educators were college teaching and program administration. Major job functions of state supervisors were program administration, program planning, and teacher supervision (Table 6). When

TABLE 6
MAJOR JOB FUNCTION OF TEACHER EDUCATORS AND STATE SUPERVISORS

<table>
<thead>
<tr>
<th>Job Function</th>
<th>Teacher Educators</th>
<th>State Supervisors</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Research and Evaluation</td>
<td>7</td>
<td>6.0</td>
<td>3</td>
</tr>
<tr>
<td>Program Planning</td>
<td>5</td>
<td>4.3</td>
<td>28</td>
</tr>
<tr>
<td>Curriculum Development</td>
<td>3</td>
<td>2.6</td>
<td>10</td>
</tr>
<tr>
<td>College Teaching</td>
<td>63</td>
<td>53.8</td>
<td>1</td>
</tr>
<tr>
<td>Student Teacher Supervision</td>
<td>13</td>
<td>11.1</td>
<td>0</td>
</tr>
<tr>
<td>Teacher Supervision</td>
<td>2</td>
<td>1.7</td>
<td>20</td>
</tr>
<tr>
<td>Program Administration</td>
<td>23</td>
<td>19.7</td>
<td>45</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>0.9</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>117</td>
<td>100.0</td>
<td>113</td>
</tr>
</tbody>
</table>
teacher educators were asked to list a second major job function, the categories most often selected were college teaching, student teacher supervision, program administration, and research and evaluation. Major second job functions in state supervision were in program planning and program administration.

**Comparison of Respondents and Non-Respondents**

A follow up of non-respondents was conducted during the week of April 20, 1970. Data were gathered from nine of the fifteen non-respondents which were sampled. Two of the fifteen were out-of-town and not available, and four were no longer in state supervision or teacher education. The majority of non-respondents were in state supervision, had worked in state supervision or teacher education one to five years, and had a master's degree. They typically: (1) used an average of 6.1 literature sources, (2) conducted their own search for information, (3) read interpretations of research, (4) utilized literature sources within the building where they worked, (5) utilized materials from educational institutions, (6) used a library within their organization, (7) communicated with their associates in problem-solving, and (8) used guidebooks, manuals, and handbooks in resolving current work-related problems.

These data were not significantly different from data gathered from respondents, with the exception that
non-respondents appeared to have experienced less tenure in teacher education or state supervision than the respondents. Therefore, it was concluded that the data gathered from the 230 respondents were representative of the 289 state supervisors and teacher educators which were originally selected as the sample for the study.

Information Sources Utilized by Teacher Educators and State Supervisors

Supporting null and alternative hypotheses were formulated to test for significant differences in the information sources utilized by teacher education and state supervisory personnel in vocational and technical education. Each paragraph in this section reports a test of one of the eight supporting hypotheses.

Table 7 reveals the literature sources used by teacher educators and state supervisors to solve work-related problems. A greater proportion of the teacher educators than state supervisors used bibliographies, publications lists, theses and dissertations, indexes, and research reviews. However, a greater proportion of the state supervisors used policy papers and curriculum and teaching guides. Little difference was noted between the two groups in the other literature sources selected. The source classification most used by both groups was that of journals and periodicals. Research Visibility, a recent addition to the American Vocational Journal, was used by over 40 per cent of the sample. The most frequently listed
<table>
<thead>
<tr>
<th>Literature Sources</th>
<th>Teacher Educators</th>
<th>State Supervisors</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N = 117</td>
<td>N = 113</td>
<td>No.</td>
</tr>
</tbody>
</table>
| Journals and Periodicals         | 98               | 86               | 184         | 80.0  
| Conference Reports               | 77               | 74               | 151         | 65.7  
| Research Reports                 | 77               | 64               | 141         | 61.3  
| Curriculum and Teaching Guides   | 65               | 75               | 140         | 60.9  
| Indexes                          | 71               | 44               | 115         | 50.0  
| State Plans                      | 59               | 53               | 112         | 48.7  
| Reference Books                  | 58               | 43               | 101         | 43.9  
| Policy Papers                    | 45               | 52               | 97          | 42.2  
| Newsletters                      | 49               | 46               | 95          | 41.3  
| Research Visibility              | 51               | 42               | 93          | 40.6  
| Research Reviews                 | 53               | 32               | 85          | 37.0  
| Bibliographies, Publ. Lists      | 51               | 31               | 82          | 35.8  
| Textbooks                        | 48               | 33               | 81          | 35.4  
| Theses and Dissertations         | 54               | 22               | 76          | 33.2  
| Other                            | 18               | 18               | 36          | 15.7  
| Total                            | 874              | 715              | 1589        |  

Critical Value at .05 - 23.68  
Chi Square - 28.97  
Contingency Coefficient - .134
sources in the "other" classification were meetings and conferences. Each teacher educator checked an average of 7.5 sources and each state supervisor checked an average of 6.83 sources. Hypothesis H_{11} was tested in its null form and rejected at the .05 level of significance. The alternative research hypothesis was accepted; teacher educators and state supervisors in vocational and technical education differed significantly in the literature sources they utilized to solve work-related problems. A significant contingency coefficient of .13 was observed.

Both teacher educators and state supervisors in vocational and technical education were found to conduct their own search for information. Table 8 reveals that 93.2 per cent of the teacher educators and 84.1 per cent of the state supervisors typically conduct their own information search. Hypothesis H_{12} was tested in its null form.

TABLE 8

<table>
<thead>
<tr>
<th>Person Searching</th>
<th>Teacher Educators</th>
<th></th>
<th>State Supervisors</th>
<th></th>
<th>Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Respondent</td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Respondent</td>
<td>109</td>
<td>93.2</td>
<td>95</td>
<td>84.1</td>
<td>204</td>
<td>88.7</td>
</tr>
<tr>
<td>Others</td>
<td>8</td>
<td>6.8</td>
<td>18</td>
<td>15.9</td>
<td>26</td>
<td>11.3</td>
</tr>
<tr>
<td>Total</td>
<td>117</td>
<td>100.0</td>
<td>113</td>
<td>100.0</td>
<td>230</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Critical Value at .05 - 3.84
Chi Square - 4.74
Contingency Coefficient - .14
form. The difference between groups was significant at the .05 level so the null hypothesis was rejected and its alternative hypothesis was supported. Teacher educators were more likely to conduct their own search for information than were state supervisors. A significant contingency coefficient of .14 was observed.

Research summaries and interpretations were utilized more by teacher educators and state supervisors in vocational and technical education than were materials reporting original research. Inspection of Table 9 reveals that 75.2 per cent of the teacher educators and 85.8 per cent of the state supervisors generally read research summaries and interpretations. Hypothesis H₁₃ was tested in its null form. The difference between groups was

**TABLE 9**

<table>
<thead>
<tr>
<th>Type of Literature Read</th>
<th>Teacher Educators</th>
<th>State Supervisors</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Original Research</td>
<td>29</td>
<td>24.8</td>
<td>16</td>
</tr>
<tr>
<td>Research Interpretations</td>
<td>88</td>
<td>75.2</td>
<td>97</td>
</tr>
<tr>
<td>Total</td>
<td>117</td>
<td>100.0</td>
<td>113</td>
</tr>
</tbody>
</table>

Critical Value at .05 = 3.84
Chi Square = 4.13
Contingency Coefficient = .13
significant at the .05 level so the null hypothesis was rejected. The alternative research hypothesis was accepted; teacher educators were more likely to read materials reporting original research than were state supervisors. A significant contingency coefficient of .13 was observed.

Table 10 presents data concerning the proximity of literature sources used by teacher educators and state supervisors in vocational and technical education. Teacher educators and state supervisors were found to differ significantly as to whether their search for literature usually occurs within or outside the building where they work. Inspection of the table reveals 67.3 per cent of the state supervisors and 46.2 per cent of the teacher educators

**TABLE 10**

PROXIMITY OF LITERATURE SOURCES USED BY TEACHER EDUCATORS AND STATE SUPERVISORS

<table>
<thead>
<tr>
<th>Proximity</th>
<th>Teacher Educators</th>
<th>State Supervisors</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Within Building Worked</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In</td>
<td>54</td>
<td>46.2</td>
<td>76</td>
</tr>
<tr>
<td>Outside Building Worked</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In</td>
<td>63</td>
<td>53.8</td>
<td>37</td>
</tr>
<tr>
<td>Total</td>
<td>117</td>
<td>100.0</td>
<td>113</td>
</tr>
</tbody>
</table>

Critical Value at .05 - 3.84
Chi Square - 10.42
Contingency Coefficient - .21
generally searched for literature within the building where they work. A significant C value of .21 was observed. Hypothesis $H_{14}$ was tested in its null form. The null hypothesis was rejected and the alternative hypothesis accepted. State supervisors were more likely to search for literature within the building where they work than were teacher educators.

In a test of Hypothesis $H_{15}$ in its null form, a significant difference was noted in the source of literature read by teacher educators and state supervisors in vocational and technical education. Both groups were more likely to utilize materials from educational institutions than materials from commercial sources. Approximately one-fourth of the state supervisors and one-eighth of the teacher educators generally searched commercial sources when they were seeking information from literature. The null hypothesis was rejected at the .05 level of significance and the alternative hypothesis was accepted. Teacher educators were found to utilize literature from educational institutions to a greater degree than were state supervisors. A significant C value of .14 was observed. These data are presented in Table 11.

The location of the library most frequently used by teacher educators and state supervisors in vocational and technical education is shown in Table 12. Both groups were found to utilize a library within their organization.
### TABLE 11
SOURCE OF MATERIALS UTILIZED BY TEACHER EDUCATORS AND STATE SUPERVISORS

<table>
<thead>
<tr>
<th>Source of Materials</th>
<th>Teacher Educators</th>
<th>State Supervisors</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Commercial Sources</td>
<td>14</td>
<td>12.0</td>
<td>26</td>
</tr>
<tr>
<td>Educational Institutions</td>
<td>103</td>
<td>88.0</td>
<td>87</td>
</tr>
<tr>
<td>Total</td>
<td>117</td>
<td>100.0</td>
<td>113</td>
</tr>
</tbody>
</table>

Critical Value at .05 - 3.84
Chi Square - 4.88
Contingency Coefficient - .14

### TABLE 12
LOCATION OF LIBRARY GENERALLY USED BY TEACHER EDUCATORS AND STATE SUPERVISORS

<table>
<thead>
<tr>
<th>Location of Library</th>
<th>Teacher Educators</th>
<th>State Supervisors</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Within Organization</td>
<td>90</td>
<td>76.9</td>
<td>77</td>
</tr>
<tr>
<td>Outside Organization</td>
<td>27</td>
<td>23.1</td>
<td>38</td>
</tr>
<tr>
<td>Total</td>
<td>117</td>
<td>100.0</td>
<td>113</td>
</tr>
</tbody>
</table>

Critical Value at .05 - 3.84
Chi Square - 2.23
Contingency Coefficient - .10

In searching for literature, inspection of Table 12 shows that 76.9 per cent of the teacher educators and 68.1 per cent of the state supervisors utilize a library within
their organization. In a test of Hypothesis H₁₆ in its null form, the difference was not significant at the .05 level. Therefore, the null hypothesis was not rejected. Teacher educators and state supervisors do not differ significantly as to whether they use a library within or outside the organization for which they work. A non-significant C value of .10 was observed.

Teacher educators and state supervisors in vocational and technical education typically consulted with associates within their organization in seeking solutions for their problems. It is shown in Table 13 that 74.1 per cent of the teacher educators and 86.7 per cent of the state supervisors more frequently utilize personal sources rather than literature sources for resolution of problems.

### TABLE 13

INFORMATION SOURCE MOST TYPICALLY CONSULTED BY TEACHER EDUCATORS AND STATE SUPERVISORS

<table>
<thead>
<tr>
<th>Source</th>
<th>Teacher Educators</th>
<th>State Supervisors</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Literature</td>
<td>30</td>
<td>15</td>
<td>45</td>
</tr>
<tr>
<td>Associates Within Organization</td>
<td>66</td>
<td>80</td>
<td>146</td>
</tr>
<tr>
<td>Persons Outside Organization</td>
<td>20</td>
<td>18</td>
<td>38</td>
</tr>
<tr>
<td>Total</td>
<td>116</td>
<td>113</td>
<td>229</td>
</tr>
</tbody>
</table>

Critical Value at .05 - 5.99  
Chi Square - 6.41  
Contingency Coefficient - .17
Literature sources were more typically utilized by 25.9 per cent of the teacher educators and 13.3 per cent of the state supervisors. In a test of Hypothesis $H_{17}$ in its null form, this difference between groups was significant at the .05 level. The null hypothesis was rejected and the alternative research hypothesis was supported. Teacher educators were more likely to use impersonal sources of information than were state supervisors. A significant $C$ value of .17 was observed.

The motivation of teacher educators and state supervisors in vocational and technical education for conducting literature searches was investigated and the data

\begin{table}
\centering
\begin{tabular}{lccc}
\hline
Motivation & Teacher Educators & State Supervisors & Total \\
& No. & \% & No. & \% & No. & \% \\
\hline
Recommended by Others & 9 & 7.8 & 7 & 6.2 & 16 & 7.0 \\
Solve Work Problems & 40 & 34.8 & 52 & 46.0 & 92 & 40.4 \\
Browse for General Information & 38 & 33.0 & 38 & 33.6 & 76 & 33.3 \\
Periodic Searches Conducted & $28$ & $24.3$ & $16$ & $14.2$ & $44$ & $19.3$ \\
Total & 115 & 100.0 & 113 & 100.0 & 228 & 100.0 \\
\hline
\end{tabular}
\caption{Motivation of Teacher Educators and State Supervisors in Seeking Information from Literature Sources}
\end{table}

Critical Value at .05 - 7.82
Chi Square - 5.07
Contingency Coefficient - .15
are presented in Table 14. Periodic searches were conducted on a systematic basis by 24.3 per cent of the teacher educators and by 14.2 per cent of the state supervisors. Searches were more frequently conducted to solve work-related problems by 46.0 per cent of the state supervisors and 34.8 per cent of the teacher educators. In a test of Hypothesis $H_{18}$ in its null form, differences were not significant at the .05 level. The null hypothesis was not rejected and the research hypothesis was not supported. Teacher educators and state supervisors in vocational and technical education did not differ significantly in their motivation for conducting a literature search. A non-significant $C$ value of .15 was observed.

**Summary**

Six of the eight supporting null hypotheses, stated to test for significant differences in the information sources utilized by teacher education and state supervisory personnel in vocational and technical education, were rejected at the .05 level of significance.

Teacher educators, when compared with state supervisors, were more likely to: (1) use bibliographies, publications lists, theses and dissertations, indexes, and research reviews, (2) conduct their own search for information, (3) read original research, (4) search for literature outside the building where they worked, (5) utilize literature from educational institutions, and (6) search
impersonal sources of information.

State supervisors, when compared to teacher educators, were more likely to: (1) use policy papers and curriculum and teaching guides, (2) have others assist in their search for literature, (3) read summaries and interpretations of research, (4) search for literature within the building where they work, (5) utilize commercial sources of literature, and (6) consult with associates within their organization.

Both groups tended to: (1) utilize journals and periodicals extensively, (2) conduct their own literature search, (3) read summaries and interpretations of research, (4) utilize materials from educational institutions, (5) use a library within their organization, and (6) consult with personal sources in problem resolution.

The groups did not significantly differ as to whether the library generally used was within or outside the organization for which they worked, or in their motivation for conducting literature searches.

Factors Related to Literature Source Utilization

Multiple linear regression was the analysis selected to detect relationships among cost, quality, and experience factors and frequency of literature source selection in solving work-related problems. The five variables obtained for each literature source were: \( X_1 \) frequency of
utilization in solving a current work-related problem, \((X_2)\) accessibility to the user, \((X_3)\) technical content, \((X_4)\) ease of use, and \((X_5)\) degree of experience of the user with the source.

Measures of variables two through five were obtained by the method of paired comparisons. Each respondent completed a questionnaire section for either accessibility and technical content or ease of use and degree of experience. Thus, the scale values for each variable were determined by using data from approximately 115 subjects.

An index of frequency of literature source utilization in solving a current work-related problem was developed for the dependent variable \((X_1)\). Each respondent was asked to relate an instance within the previous two weeks when he was actively searching for information. Literature sources which were used in the search were ranked by the respondent in the order he used them. The frequency a source was ranked first in search order was doubled and added to the frequency it was ranked second. Thus, the first source which was searched received a double weight when compared to the second source which was searched. The equation follows:

\[
X_1 = 2f_1 + f_2
\]

Where: \(X_1\) = index of the dependent variable  
\(f_1\) = frequency a source was searched first  
\(f_2\) = frequency a source was searched second
It was hypothesized that each of the four independent variables were positively related to the index of frequency of information source utilization in solving a current work-related problem. The intercorrelation matrix is presented in Table 15. Six categories of literature sources were rated by the respondents (Table 16). Because only six literature sources were rated, a coefficient of correlation of .811 was required for statistical significance. However, each scale value represented inputs from approximately 115 respondents. Therefore, a high degree of confidence was placed in the correlations which were observed.

TABLE 15

COEFFICIENTS OF CORRELATION OF FACTORS RELATED TO FREQUENCY OF INFORMATION SOURCE UTILIZATION

<table>
<thead>
<tr>
<th>Variable</th>
<th>$X_1$</th>
<th>$X_2$</th>
<th>$X_3$</th>
<th>$X_4$</th>
<th>$X_5$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$X_1$</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$X_2$</td>
<td>.797</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$X_3$</td>
<td>-.606</td>
<td>-.750</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$X_4$</td>
<td>.718</td>
<td>.866*</td>
<td>-.344</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>$X_5$</td>
<td>.776</td>
<td>.949*</td>
<td>-.518</td>
<td>.940*</td>
<td>1.000</td>
</tr>
</tbody>
</table>

*.05 level of significance - .811

$n = 6$

$X_1$ = frequency of literature source utilization

$X_2$ = accessibility

$X_3$ = technical content

$X_4$ = ease of use

$X_5$ = degree of experience
A significant multiple correlation coefficient ($R$) of $0.9860$ and a coefficient of determination ($R^2$) of $0.9722$ were obtained. The data are summarized in Table 16 and are graphed in Figure 4.

In a test of Hypothesis $H_{21}$, accessibility ($X_2$) of the literature source to the user was correlated with frequency of information source selection ($X_1$) at $0.797$. This finding further supports a similar finding by Gerstberger and Allen in a study of research and development engineers. "Accessibility is definitely the dominant cost criterion determining the relative frequency with which information channels are used."$^55$

In a test of Hypothesis $H_{22}$, technical content ($X_3$) of literature sources was negatively correlated with all other variables, including frequency of use ($X_1$). Inspection of Figure 4 reveals that sources rated high in technical content were perceived to be inaccessible and difficult to use. Users also had little experience in using the sources rated high in technical content.

In a test of Hypothesis $H_{23}$, ease of use ($X_4$) of information sources was positively correlated with the dependent variable at $0.718$. Both ease of use and degree of experience ($X_5$) were significantly correlated with each other and with accessibility ($X_2$) at the $0.05$ level. In a test of Hypothesis $H_{24}$, degree of experience was positively

$^55$Gerstberger, op. cit., p. 175.
<table>
<thead>
<tr>
<th>Literature Source</th>
<th>Frequency of Use ($X_1$)</th>
<th>Accessibility ($X_2$)</th>
<th>Technical Content ($X_3$)</th>
<th>Ease of Use ($X_4$)</th>
<th>Degree of Experience ($X_5$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theses, Reports, Monographs</td>
<td>52</td>
<td>.0000</td>
<td>.4394</td>
<td>.0410</td>
<td>.0123</td>
</tr>
<tr>
<td>Review and Interpretation Papers</td>
<td>59</td>
<td>.2095</td>
<td>.3356</td>
<td>.2847</td>
<td>.0155</td>
</tr>
<tr>
<td>Books</td>
<td>59</td>
<td>.5517</td>
<td>.0629</td>
<td>.1004</td>
<td>.2578</td>
</tr>
<tr>
<td>Bibliographies, Indexes, Catalogs</td>
<td>108</td>
<td>1.2486</td>
<td>.0000</td>
<td>.8521</td>
<td>1.0770</td>
</tr>
<tr>
<td>Journals, Newsletters, Periodicals</td>
<td>130</td>
<td>.8659</td>
<td>.1549</td>
<td>.6262</td>
<td>.8093</td>
</tr>
<tr>
<td>Guidebooks, Manuals, Handbooks</td>
<td>146</td>
<td>.4543</td>
<td>.1792</td>
<td>.3483</td>
<td>.4681</td>
</tr>
<tr>
<td>Mean</td>
<td>92.3</td>
<td>.5440</td>
<td>.1702</td>
<td>.3174</td>
<td>.3620</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>41.0</td>
<td>.4543</td>
<td>.1792</td>
<td>.3483</td>
<td>.4681</td>
</tr>
</tbody>
</table>
Figure 4. Factors related to utilization of information sources.

$X_1$ = Frequency of Utilization
$X_2$ = Accessibility
$X_3$ = Technical Content
$X_4$ = Ease of Use
$X_5$ = Degree of Experience
correlated with frequency of literature source selection at .776.

Journals, newsletters, and periodicals were rated highest in accessibility, ease of use, and degree of experience, but lowest in technical content. Theses, reports, and monographs received a high rating in technical content, but very low ratings in ease of use, accessibility, and degree of experience. Review and interpretation papers received moderate ratings in technical content, ease of use, and accessibility but a very low rating in degree of experience. Bibliographies, indexes, and catalogs were frequently used to solve current work-connected problems, but were rated very low in technical content, ease of use, and degree of experience. Guidebooks, handbooks, and manuals were used most often in problem-solving, and received high ratings on all factors except technical content.

Summary

The factors of accessibility, ease of use, and degree of experience were positively correlated with frequency of literature source selection in solving a work-related problem. Accessibility appeared to be the most potent independent variable for prediction of literature source utilization. Technical content was negatively correlated with frequency of use. Sources rated high in technical content were perceived to be inaccessible and
difficult to use. Sources with the greatest utilization were journals, newsletters, and periodicals and guidebooks, handbooks, and manuals.

**Literature Sources Used to Resolve Work-Related Problems**

Four null and alternative hypotheses were developed to test for significant differences among literature sources used in resolving work-related problems. This section reports findings related to these four hypotheses.

Each respondent was asked to state two problems he might typically encounter in his work. He then responded to a question asking him to check those literature sources he found of value in solving problems such as those he had stated. These data were cross-tabulated in Table 17 to test Hypothesis \( H_31 \) in its null form. No significant differences were found; therefore, the null hypothesis was not rejected. Major problems encountered in connection with a person's work did not significantly influence the literature sources he utilized. A non-significant contingency coefficient of .14 was observed.

Inspection of Table 17 did reveal curriculum and teaching guides were used to a greater extent by persons with major problems relating to administration and supervision and to curricula and instructional materials, but received less emphasis by persons with major problems relating to teachers and teacher education. Research
Table 17

Major Problems Encountered and Literature Sources Utilized

<table>
<thead>
<tr>
<th>Source</th>
<th>Administration &amp; Supervision</th>
<th>Employment &amp; Occupations</th>
<th>Curriculum, Instructional Materials</th>
<th>Philosophy Research and Special Objectives Evaluation</th>
<th>Students and Guidance</th>
<th>Teaching and Learning</th>
<th>Teachers, Teacher Education</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Journals, Periodicals</td>
<td>101</td>
<td>12.1</td>
<td>20</td>
<td>13.7</td>
<td>100</td>
<td>11.4</td>
<td>12</td>
<td>9.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bibilographies</td>
<td>36</td>
<td>4.3</td>
<td>8.5</td>
<td>57</td>
<td>5.4</td>
<td>8</td>
<td>6.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Theeses, Dissertations</td>
<td>32</td>
<td>3.8</td>
<td>7.4</td>
<td>41</td>
<td>4.7</td>
<td>8</td>
<td>6.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Research Visibility</td>
<td>49</td>
<td>5.9</td>
<td>10.6</td>
<td>53</td>
<td>6.0</td>
<td>10</td>
<td>8.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Textbooks</td>
<td>36</td>
<td>4.3</td>
<td>4.2</td>
<td>50</td>
<td>5.7</td>
<td>6</td>
<td>4.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>State Plans</td>
<td>79</td>
<td>9.4</td>
<td>8.5</td>
<td>62</td>
<td>7.1</td>
<td>8</td>
<td>6.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Reference Books</td>
<td>50</td>
<td>5.9</td>
<td>7.4</td>
<td>62</td>
<td>7.1</td>
<td>6</td>
<td>4.9</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Research Reports</td>
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</table>

Critical Value at .05 = 128.52
Chi Square = 57.71
Contingency Coefficient = .14

reviews and textbooks were used less by those with major work problems related to administration and supervision; however, policy statements were used more by this group. Research reports and research reviews were used more by those with major problems relating to research and evaluation, but research reports were used less than expected by respondents with problems in teacher education.

Each respondent stated a problem occurring within
the previous two-week period for which he conducted a
literature search. He then ranked the literature sources
in the order he used them in his search for information.
Inspection of Table 18 reveals that, for all problems taken
collectively, literature sources were utilized first by
respondents in the following order of priority: (1) guide-
books, manuals, handbooks, (2) bibliographies, indexes,
catalogs, (3) journals, newsletters, periodicals, (4) re-
search reviews and interpretations, (5) theses, reports,
monographs, and (6) books. Hypothesis $H_{32}$ was tested in
its null form. No significant differences were found
among problems needing resolution and the first literature
source from which information was sought. Therefore, the
null hypothesis was not rejected. In searching for specific
information, the literature sources utilized were not sig-
nificantly related to the type of problem needing resolu-
tion. A non-significant $C$ value of .45 was observed.

It was noted, however, that research reviews and
interpretations were first consulted more often when
problems were related to employment and occupations, phi-
losophy and objectives, and research and evaluation. Bib-
liographies and indexes were consulted more often by those
with problems relating to teachers and teacher education,
teaching and learning, and philosophy and objectives.
Guidebooks, manuals, and handbooks were utilized more often
by those with problems relating to administration,
### Table 18

<table>
<thead>
<tr>
<th>Problem</th>
<th>Research Reviews &amp; Interpretations</th>
<th>Bibliographies, Indexes, Catalogs</th>
<th>Guidebooks, Manuals, Handbooks</th>
<th>Journals, Newsletters, Periodicals</th>
<th>Theses, Reports, Monographs</th>
<th>Books</th>
<th>TOTAL</th>
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<td>7</td>
<td>13.2</td>
<td>7</td>
<td>13.2</td>
<td>22</td>
<td>44.5</td>
<td>13</td>
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<td>Employment &amp; Occupations</td>
<td>4</td>
<td>26.7</td>
<td>2</td>
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<tr>
<td>Facilities &amp; Equipment</td>
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<td>0.0</td>
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<td>14.3</td>
<td>4</td>
<td>57.1</td>
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<tr>
<td>Curriculum &amp; Instructional Materials</td>
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<td>11</td>
<td>27.5</td>
<td>12</td>
<td>39.0</td>
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<tr>
<td>Individuals With Special Needs</td>
<td>4</td>
<td>16.7</td>
<td>5</td>
<td>20.8</td>
<td>7</td>
<td>29.1</td>
<td>5</td>
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<td>Philosophy &amp; Objectives</td>
<td>1</td>
<td>25.0</td>
<td>2</td>
<td>50.0</td>
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<td>Research &amp; Evaluation</td>
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<td>Students &amp; Guidance</td>
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<td>33.3</td>
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<td>Teachers &amp; Teacher Education</td>
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<td><strong>TOTAL</strong></td>
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Critical Value at .05 = 16.92
Chi Square = 51.99
Contingency Coefficient = .45

### Table 19

<table>
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<tr>
<th>Problem</th>
<th>Successful Search</th>
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<td>Philosophy &amp; Objectives</td>
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<td>Research &amp; Evaluation</td>
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<td>79.2</td>
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<td><strong>TOTAL</strong></td>
<td><strong>153</strong></td>
<td><strong>75.7</strong></td>
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</table>

Critical Value at .05 = 16.92
Chi Square = 51.99
Contingency Coefficient = .26
supervision, facilities, and equipment.

It was hypothesized that the type of problem would be significantly related to whether the user would obtain the needed information through a literature search. Data pertinent to the null and alternative forms of Hypothesis H33 are presented in Table 19. No significant relationship was found; therefore, the null hypothesis was not rejected. The type of problem needing resolution was not significantly related to whether the user obtained the information through a literature search. A non-significant C value of .26 was observed. Fewer than the average proportion of successful searches were conducted to resolve problems relating to facilities and equipment, philosophy and objectives, and teaching and learning.

Table 20 presents findings concerning the stage in problem-solving at which users seek information and the literature sources utilized. Inspection of the table reveals literature sources are used most often in background and definition, developing tentative solutions, examining alternatives, and evaluating outcomes. Hypothesis H34 was stated in its null form. No significant differences were found among the stages in problem-solving and literature sources utilized. Therefore, the null hypothesis was not rejected. The stage in problem-solving in which users are most likely to seek information was not significantly related to the literature sources generally utilized. A


<table>
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<tr>
<th>Literature Source</th>
<th>Background</th>
<th>Examining</th>
<th>Developing</th>
<th>Implications</th>
<th>Collecting</th>
<th>Applying</th>
<th>Evaluating</th>
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**TOTAL**: 631 100.0 231 100.0 243 100.0 24 100.0 171 100.0 52 100.0 143 100.0 1695 100.0

Critical Value at .05 - 99.33
Chi Square - 41.38
Contingency Coefficient - .16

non-significant C value of .16 was observed. It was noted, however, that those who tend to seek information in deducting implications refer to journals, periodicals, and newsletters less, and to research reports, indexes, research reviews, and policy statements more, than those selecting other categories of problem-solving. Research visibility was not utilized by those who tend to seek information in developing solutions.

**Summary**

None of the four null hypotheses, stated to test
for significant differences among literature sources in solving work-related problems, were rejected at the .05 level of significance. In resolving a current work-related problem, literature sources were selected in the following order of priority: (1) guidebooks, manuals, handbooks, (2) bibliographies, indexes, catalogs, (3) journals, newsletters, periodicals, (4) research reviews and interpretations, (5) theses, reports, monographs, and (6) books. Approximately three-fourths of the literature searches resulted in information with which the user was satisfied. The stage in problem-solving at which literature was used most was in developing a background and definition of the problem.
CHAPTER IV

SUMMARY, CONCLUSIONS AND IMPLICATIONS, AND RECOMMENDATIONS

Summary

The central purpose of this study was to investigate factors influencing the utilization of information for problem-solving by state supervisory and teacher education personnel in vocational and technical education.

Objectives

Objectives essential to the conduct of the study were:

1. To identify differences between teacher educators and state supervisors in vocational and technical education in their utilization of information.

2. To identify relationships between frequency of literature source selection in solving work-related problems and vocational educators' perceived accessibility, ease of use, and technical content of and degree of experience with literature sources.
3. To identify major sources of information used by vocational educators in solving work-related problems.

Procedure

The target population for the study consisted of teacher education and state supervisory personnel in vocational and technical education. Seven states were purposively selected to optimize geographic representation and to include states with varying size staffs of teacher educators and state supervisors. All the 148 state supervisors and 141 teacher educators in the seven states were sampled. A mail questionnaire was field tested and revised prior to its utilization. Responses were obtained from 230 of the 289 subjects, which was 80 per cent of the sample. Treatment of the data was accomplished through a description of the sample, analysis of data presented in contingency tables, and multiple linear regression. Questionnaire responses were coded and analyzed through use of The Ohio State University Computer Center.

Three major and sixteen supporting null and alternative hypotheses were developed to investigate factors influencing the utilization of information for problem-solving by state supervisory and teacher education personnel in vocational and technical education.
Findings

Six of the eight supporting null hypotheses, stated to test for differences in the information sources utilized by teacher education and state supervisory personnel in vocational and technical education, were rejected at the .05 level of significance.

Teacher educators, when compared with state supervisors, were more likely to: (1) use bibliographies, publications lists, theses and dissertations, indexes, and research reviews, (2) conduct their own search for literature, (3) read original research, (4) search for literature outside the building where they worked, (5) utilize literature from educational institutions, and (6) search impersonal sources of information.

State supervisors, when compared to teacher educators, were more likely to: (1) use policy papers and curriculum and teaching guides, (2) have others assist in their search for literature, (3) read summaries and interpretations of research, (4) search for literature within the building where they work, (5) utilize commercial sources of literature, and (6) consult with associates within their organization.

Collectively, teacher educators and state supervisors tended to: (1) utilize journals and periodicals extensively, (2) conduct their own literature search, (3) read summaries and interpretations of research, (4)
utilize materials from educational institutions, (5) use a library within their organization, and (6) consult with personal sources in problem resolution.

The groups did not significantly differ as to whether the library generally used was within or outside the organization for which they worked, or in their motivation for conducting literature searches.

The factors of accessibility, ease of use, and degree of experience were positively correlated with frequency of literature source selection in solving a work-related problem. Accessibility appeared to be the most potent independent variable for prediction of literature source utilization. Technical content was negatively correlated with frequency of use. Sources rated high in technical content were perceived to be inaccessible and difficult to use. A significant multiple correlation coefficient (R) of .9860 and a coefficient of determination (R^2) of .9722 between the independent variables and frequency of literature source utilization were obtained. Sources with the greatest utilization in solving current work-related problems were journals, newsletters, and periodicals, and guidebooks, handbooks, and manuals.

None of the four null hypotheses, stated to test for significant differences among literature sources in solving work-related problems, were rejected at the .05 level of significance. In resolving a current work-related
problem, literature sources were utilized in the following order of frequency: (1) guidebooks, manuals, handbooks, (2) bibliographies, indexes, catalogs, (3) journals, newsletters, periodicals, (4) research reviews and interpretations, (5) theses, reports, monographs, and (6) books. Approximately three-fourths of the literature searches resulted in information with which the user was satisfied.

The stage in problem-solving in which literature was used most was in developing a background and definition of the problem.

Conclusions and Implications

The findings of the study were the basis for conclusions and implications having possible significance for researchers, teacher educators, state supervisors, and information specialists in vocational and technical education.

Conclusion 1

Accessibility appears to be the dominant factor influencing frequency of utilization of literature sources.

Implication 1

Information dissemination systems, promoters of educational change, and producers of research must make their products accessible (i.e. readily obtainable) if real impact upon the profession is desired.
Conclusion 2

Teacher educators and state supervisors normally utilize libraries within the institution and building where they work.

Implication 2

Further support is noted for making resource materials readily accessible to teacher educators and state supervisors.

Conclusion 3

Teacher educators and state supervisors tend to read interpretations of research to a greater extent than reports of original research.

Implication 3

Research needs to be repackaged, reviewed, summarized, and interpreted to improve the linkage from knowledge to application.

Conclusion 4

Because guidebooks, manuals, and handbooks are the literature sources utilized to the greatest degree in resolving current work-related problems, it appears that "how to" answers are being sought to a greater extent than "why" answers.

Implication 4

Incorporation of research findings into the
main stream of operational procedure would be facilitated by synthesizing the findings for practical application.

**Conclusion 5**

Materials from educational institutions are utilized to a greater extent than materials from commercial sources.

**Implication 5**

The educational community has a responsibility to review, repackage, summarize, and interpret information from all sources to leadership personnel in vocational and technical education.

**Conclusion 6**

Teacher educators utilize research-oriented literature to a greater extent than state supervisors. State supervisors utilize "how to" literature to a greater extent than teacher educators.

**Implication 6**

Materials should be developed with consideration for characteristics of the target audience.

**Conclusion 7**

Teacher educators and state supervisors usually conduct their own search for information. In conducting their own search, they can expect to obtain satisfactory
information for approximately three-fourths of their current work-related problems.

Implication 7

Educational programs to train user groups to seek out available information are needed, information systems and products must be made more accessible to individual users, and research is required to identify and fill information gaps.

Conclusion 8

Journals and periodicals are utilized to a greater extent by teacher educators and state supervisors in vocational and technical education than any other single professional literature source.

Implication 8

The current literature source with the potential for reaching the greatest audience of teacher educators and state supervisors is journals and periodicals.

Conclusion 9

The literature sources with which a person is familiar continue to be used in solving current work-related problems.

Implication 9

Educational programs and accessibility to users
are required to achieve high utilization of new and different information sources, products, and systems.

**Conclusion 10**

Personal sources of information are utilized to a greater extent than literature sources.

**Implication 10**

Conferences, workshops, and other settings which provide opportunity for interaction among heterogeneous groups of participants are useful linkage mechanisms. Participants should fulfill diverse roles in linking research to practice.

**Conclusion 11**

Literature sources rated high in technical content by vocational educators are perceived to be relatively inaccessible.

**Implication 11**

It is possible that educators perceive literature with which they are less familiar as being higher in technical content. Improved accessibility of literature believed to be higher in technical content should improve its utilization.

**Conclusion 12**

Teacher educators and state supervisors tend to
utilize literature sources they perceive to be easy to use to a greater extent than those which they perceive to be difficult to use.

Implication 12

Ease of use is an important consideration in the development of information products and systems for vocational education.

Conclusion 13

The same general types of literature sources are used by leadership personnel in vocational and technical education, regardless of their major job problems.

Implication 13

Personnel may not be familiar with or have access to divergent sources of professional literature.

Conclusion 14

Teacher educators and state supervisors having problems related to teaching and learning are less likely to conduct satisfactory literature searches than those seeking solution to other types of problems.

Implication 14

Fewer answers are available to resolve problems related to teaching and learning; thus, this is an area of needed research emphasis. Users with problems in this area need assistance in seeking and interpreting
information which is available.

**Conclusion 15**

Teacher educators and state supervisors having problems related to research and evaluation are more likely to conduct satisfactory literature searches than those seeking solutions to other types of problems.

**Implication 15**

Users with problems relating to research and evaluation need less assistance in seeking and interpreting information than those with major problems in other areas.

**Conclusion 16**

Users tend to use literature sources in the early stages of problem development to a greater extent than in the later stages.

**Implication 16**

Primary emphasis in review and interpretation papers should be placed on assisting users in developing a background and definition, examining alternatives, and developing solutions for their major work-related problems.

**Conclusion 17**

A major portion of the variance ($R^2 = .97$) associated with frequency of literature source utilization in resolving current work-related problems may be account-
ed for by a knowledge of subjects' perceived accessibility, ease of use, and technical content of and degree of experience with the literature sources.

Implication 1?

Major factors related to frequency of literature source utilization in resolving current work-related problems have been identified.

Recommendations

The findings and conclusions of the study serve as a basis for the following recommendations.

1. It is recommended that additional emphasis be given to reviewing, summarizing, interpreting, and repackaging the knowledge base for user groups in vocational and technical education.

2. It is recommended that educational programs be developed to train target audiences to search the knowledge base.

3. It is recommended that educational institutions make literature sources readily accessible to teacher educators and state supervisors.

4. It is recommended that conferences, workshops, and other settings which provide
for interaction among participants with diverse roles in linking research and practice be given additional emphasis as a mechanism for dissemination of information.

5. It is recommended that "how to" documents be developed for specific applications of information in the knowledge base.

6. It is recommended that information systems and products in vocational and technical education be more fully developed to improve their accessibility and ease of use.

Additional areas of research have been suggested by this study. Some of the more important of these areas are:

1. Research of the same type as this study to identify factors influencing the utilization of information by other target audiences in vocational and technical education.

2. Research to determine the critical information needs of key groups in vocational and technical education.

3. Research, utilizing an experimental design, to determine the more useful information products with various target audiences in vocational and technical education.
4. Research to evaluate educational strategies for improving utilization of the knowledge base by practitioners.

5. Research to more fully test for relationships between the type of problem encountered and information sources utilized by vocational educators.

6. Evaluative studies of information systems and products to provide feedback to those concerned with production and utilization of research.

7. Research for further development and refinement of information dissemination systems.
APPENDIX A

QUESTIONNAIRE
UTILIZATION OF INFORMATION BY VOCATIONAL EDUCATORS

INSTRUCTIONS

Please complete this section of the questionnaire by providing a written answer or by checking the appropriate blank(s). Answers will be kept in strictest confidence and be used only in the tabulation of group data for analysis.

PART I

1. What is your job title?

2. Where is your office located?
   - With the state division staff
   - Within a state university
   - Within a private college or university
   - In a detached location in a different city
   - Other (specify)

3. How long have you worked in teacher education or state supervision? (include this year)
   - 1 - 5 years
   - 6 - 10 years
   - 11 - 15 years
   - 16 or more years

4. What is your age?
   - 29 years or less
   - 30 - 39 years
   - 40 - 49 years
   - 50 - 59 years
   - 60 or more years

5. What amount of professional preparation have you completed? (check highest)
   - Less than Bachelor's
   - Bachelor's Degree
   - Bachelor's Degree plus
   - Master's Degree
   - Master's Degree plus
   - Doctoral Degree
6. What do you consider as your major job function(s)? (rank those which apply)

<table>
<thead>
<tr>
<th>Function</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research and Development</td>
<td></td>
</tr>
<tr>
<td>Evaluation and Measurements</td>
<td></td>
</tr>
<tr>
<td>Program Planning</td>
<td></td>
</tr>
<tr>
<td>Curriculum Development</td>
<td></td>
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<tr>
<td>College Teaching</td>
<td></td>
</tr>
<tr>
<td>Student Teacher Supervision</td>
<td></td>
</tr>
<tr>
<td>Teacher Supervision</td>
<td></td>
</tr>
<tr>
<td>Program Administration</td>
<td></td>
</tr>
<tr>
<td>Other (specify)</td>
<td></td>
</tr>
</tbody>
</table>

7. Within your major job function, list two typical problems which require information in their resolution. (e.g. Making curriculum changes necessary to improve student awareness of job opportunities and requirements)

Please place a check mark after the following information sources which have had an impact on finding solutions to the typical problems you have listed. (check as many blanks as are applicable)

<table>
<thead>
<tr>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Journals and Periodicals, e.g. American Vocational Journal</td>
</tr>
<tr>
<td>Bibliographies, Annotated Bibliographies,</td>
</tr>
<tr>
<td>Publication Lists</td>
</tr>
<tr>
<td>Theses and Dissertations</td>
</tr>
<tr>
<td>Research Visibility (in American Vocational Journal)</td>
</tr>
<tr>
<td>Textbooks</td>
</tr>
<tr>
<td>State Plans</td>
</tr>
<tr>
<td>Reference Books</td>
</tr>
<tr>
<td>Research Reports</td>
</tr>
<tr>
<td>Conference Reports</td>
</tr>
<tr>
<td>Indexes, e.g. Research in Education (RIE), Abstracts of Research</td>
</tr>
<tr>
<td>and Related Materials in Vocational and Technical Education (ARM)</td>
</tr>
<tr>
<td>Current Index to Journals in Education (CIJE), Abstracts of Instructional Materials in Vocational and Technical Education (AIM)</td>
</tr>
<tr>
<td>Newsletters, e.g. RCU Newsletters, Centergram</td>
</tr>
<tr>
<td>Reviews and Syntheses of Research, e.g. Center for Vocational and Technical Education Review and Synthesis series</td>
</tr>
<tr>
<td>Policy Statements and Papers</td>
</tr>
<tr>
<td>Curriculum and Teaching Guides</td>
</tr>
<tr>
<td>Others (specify)</td>
</tr>
</tbody>
</table>
8. Choose four of the following stages in problem-solving when you are most likely to seek information. (rank them in order of priority from 1 to 4)

- In arriving at the background and definition of a problem, idea, or situation
- In examining alternatives and weighing their advantages and disadvantages
- In developing a tentative solution to a problem, idea, or situation
- In deducting the implications of putting an idea into effect
- In the observation or collection of data to support or solve an idea or problem
- In seeking ways of applying knowledge to additional settings
- In evaluating the outcomes of a program, idea or applied solution
- Other (please specify)

9. In searching the literature, do you typically: (circle the letter within each pair indicating the best choice)

A. Do your own search.
B. Have someone else search for you.

A. Read original research.
B. Read interpretations of research.

A. Utilize sources within the building where you work.
B. Utilize sources outside the building where you work.

A. Utilize materials from commercial sources.
B. Utilize materials from educational institutions.

A. Use a library within your organization.
B. Use a library outside your organization.

10. In seeking information to help in solving typical problems encountered in your work, do you most often: (check one)

Communicate with associates within your organization.
Search the literature.
Communicate with persons outside your organization.
11. What normally motivates you to seek information from literature sources? (check the one best statement)

To find information recommended by other individuals
To solve work-connected problems
To browse for general information for professional improvement
To search periodically in a systematic manner in connection with your work
Other (specify)

12. Try to recall an instance during the past two weeks when you were actively searching for information. Please fill in a description of the type of information you sought and indicate below the numerical order in which you searched for the information. (rank only those sources you used)

<table>
<thead>
<tr>
<th>Type of information sought</th>
<th>Search Order</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review and Interpretation Papers, e.g. Research Visibility, Review and Synthesis of Research, Information Analysis Products, etc.</td>
<td></td>
</tr>
<tr>
<td>Bibliographies, Indexes, Catalogs, e.g. RIE, CIJE, AIM, ARM, Annotated Bibliographies, Publications Lists, etc.</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Books, e.g. Textbooks, Reference Books, etc.</td>
<td></td>
</tr>
</tbody>
</table>

Did you find the information you were seeking? Yes No
Please circle the letter (A or B) representing the information source within each pair which you judge to be more accessible. Ignore all considerations of the technical content expected within the source. Accessibility is defined as "obtainability" or the ease of securing a source.

1. A. Journals, Newsletters, Periodicals, e.g. American Vocational Journal, RCU Newsletters, etc.  
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APPENDIX B

COVER LETTER
To: SELECTED STATE SUPERVISORY AND TEACHER EDUCATION STAFFS IN VOCATIONAL AND TECHNICAL EDUCATION

You are the key source of information in a nationwide study designed to contribute to improved information availability for decision-makers in vocational and technical education. We believe you share with us a concern about the availability and utilization of research and related information to help solve operational problems. Your state director has granted us permission to request your cooperation in completing a questionnaire that will require approximately 15 to 30 minutes of your time. The investigation is being conducted by the ERIC Clearinghouse for Vocational and Technical Education.

I am requesting that you take the following action:

1. Fill out the questionnaire, following instructions contained within it.

2. Place both the enclosed card and completed questionnaire in the envelope provided.

3. Mail the material to me.

It is necessary to have a record of respondents on the separate cards in order to contact any non-respondents. No individual responses will be revealed. They will be submerged in the overall analysis of the study population. An abstract of the study will be sent to each participant.

Thank you for your help.

Sincerely yours,

J. David McCracken
Research Associate
APPENDIX C
FOLLOW UP LETTER
To: Teacher Educators and State Supervisory Personnel

Earlier this month I sent you a questionnaire entitled, "Information Source Utilization by Vocational Educators." If you have already responded, please disregard this second notice. But, if you haven't completed the questionnaire and mailed it yet, please do so.

A good sample of returns has been received from your state, but I need your completed questionnaire to give this study real meaning and validity. The current mail strike has not yet held up returns from any of the states in the sample.

I enclose another copy of the questionnaire in case yours has gone astray. May I hear from you by April 3rd?

Thank you for your cooperation.

Sincerely yours,

J. David McCracken
Research Associate


