DOCUMENT RESUME

ED 079 533   VT 020 744

AUTHOR   Schroeder, Paul E.
TITLE   The Status of Vocational Education R, D, D, and E
                Personnel. Final Report.
INSTITUTION   Minnesota Univ., Minneapolis.
SPONS AGENCY   National Center for Educational Research and
                Development (DHEW/OE), Washington, D.C. Division of
                Higher Education Research.
BUREAU NO   BR-1-8132
PUB DATE   Mar 73
GRANT   OEG-0-71-4360
NOTE   211p.

EDRS PRICE   MF-$0.65 HC-$9.87
DESCRIPTORS   Data Analysis; Data Collection; Diffusion;
                Educational Development; *Educational Researchers;
                Evaluation; General Education; Inservice E· ·ation;
                *Job Skills; *Participant Characteristics; _eservice
                Education; *Surveys; *Vocational Education

ABSTRACT
                The objectives of this study were to: (1) identify
personnel conducting research, development, diffusion, and evaluation
(RDDE) activities in vocational education and related fields, (2)
collect data describing them and their jobs, and (3) perform an
analysis of the data to characterize the current status of vocational
RDDE personnel and their activities. The major reason for conducting
the study was to provide descriptive information which could be used
to make decisions about RDDE activities and training programs.
Questionnaire data obtained from the identified personnel showed that
respondents classified themselves according to educational field as
being 47.4 percent in vocational education, 18.7 percent in
non-vocational education, and 31.4 percent part vocational and part
non-vocational. Forty percent of the group surveyed indicated that
they spent 25 percent or more of their time on RDDE activities. While
no important distinctions between vocational and non-vocational
groups as to job activities and skills utilized were suggested, the
most significant result of the study was found in differences among
research-related job functions. Detailed responses and analyses are
presented in narrative and tabular form. Data from the study may be
useful in developing both preservice and in-service training programs
for RDDE personnel. (MF)

Final Report

Project No. 1-8132
Grant No. OEG-0-71-4360

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THE STATUS OF VOCATIONAL EDUCATION
R, D, D, AND E PERSONNEL

March, 1973

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Office of Education

National Center for Educational Research and Development
(Research Training Branch)

FINAL. REPORT RECEIVED
AND APPROVED

Chief, _____ Branch
4/30/73

ED 079533

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PREFACE

The author wishes to express his sincere thanks and appreciation to the following people whose encouragement and help made the completion of this study possible.

First, to my wife, Marilynn, and our sons, Christopher and Jonathan, for their constant faith in and understanding of a graduate-student husband and father, all of which made the work worthwhile.

Second, to my advisor, Dr. Jerome Moss, Jr., for his advice and support in pursuing a graduate-studies program and this project.

Third, to Dr. Blaine Worthen and Dr. Harry Ammerman for their cooperation in providing information from their RDDE personnel studies.

Fourth, to the United States Department of Defense, Marine Corps for their assistance and the use of computer facilities and programs to perform part of the data analysis.

Fifth, to the United States Office of Education, National Center for Educational Research and Development, Research Training Branch, for granting the funds which made this study possible.

Finally, to all those persons who took some of their valuable time to participate in this study.

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Paul Erwin Schroeder

March, 1973

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Chapter 1

INTRODUCTION

THE PROBLEM AREA

With the passage of the Elementary and Secondary Education
Act of 1965, specifically with the provisions of Title IV of the
Act and the amendments to the Cooperative Research Act of 1958 con-
tained in that Title, a nation wide effort was begun to establish
training programs for educational research and research-related
personnel.

Five years prior to the passage of the ESEA the Office of
Education was spending between ten and eleven million dollars per
year on research and research-related activities. In four of the
five years after the passage of the ESEA the expenditures had
approached 100 million dollars per year (Clark and Hopkins, 1969).

The increased spending on research activities has caused a
demand for more trained research personnel which, unfortunately,
has not been met by the increased expenditures for research
training programs (Clark and Hopkins, 1969; Gideonse, 1969). De-
spite the availability of over 30 million dollars for training
research and research-related personnel, a critical shortage of
such personnel exists.

It is only in the past several years that there has been a
real concern with the failure of research training activities to

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meet the demands for qualified personnel. This concern has manifested itself in the form of several efforts to coordinate previous manpower studies and projections, present training programs, and future training-program planning. These efforts were in the form of exploratory studies to (a) locate research and research-related personnel, (b) conceptualize and define more precisely the exact nature of educational research (R) and research-related activities such as development, diffusion, and evaluation (DDE), and (c) to determine what research, development, diffusion, evaluation, and other research-related personnel are like and how they are similar and/or different in terms of personal characteristics, training backgrounds, job tasks, job products and services, and skills and competencies necessary for their work.

This study is one of several that have been conducted to provide information which will aid in planning further manpower studies of educational RDDE personnel and in establishing training programs to meet the demand for a sufficient supply of high quality personnel.

STATEMENT OF THE PROBLEM

In discussing R, D, D, and E activities and personnel there exists the problem of a lack of information about RDDE activities and a lack of information describing RDDE personnel conducting these activities in terms such as their numbers, location, personal characteristics (age, degrees, etc.), job tasks performed, and job-related skills and competencies possessed.

The problem exists for both of the two generally defined educational divisions, general education and vocational education. Two recent studies (Worthen and others, 1971; Schalock and others, 1972) have dealt with exploring the problem in general education. This study has focused on providing information about vocational education RDDE personnel and activities.

SIGNIFICANCE OF THE PROBLEM

There appears to be at least two reasons for obtaining more precise information about RDDE activities and personnel in vocational education.

First, in order to assist in decision-making concerning the pace at which current and future RDDE activities in vocational education can proceed, it is necessary to know the current manpower status of p onnel who have conducted, are currently conducting, or who might conduct such activities, with particular attention to their numbers, location, place of work, educational training backgrounds, previous work experience, present job classification (R, D,D, or E, etc.), percentage time spent performing various job activities (R,D,D,E, etc.), present job tasks performed, and the products and services produced by the job.

Second, in order to provide adequately designed pre-service and in-service training programs for vocational education RDDE personnel, it is necessary to know the status of those personnel, with particular emphasis placed on the job tasks they perform, knowledges/ skills they utilize, and their in-service training needs.

OBJECTIVES

The objectives of this study, then, were (a) to identify
personnel conducting research, development, diffusion, and evalua-
tion activities in vocational education and related fields, (b) to
collect data describing those pr~nle and their jobs, and (c) to
provide an analysis of the   which would characterize the cur-
rent status of vocational RDDE personnel and their activities.

Since the major reason for conducting this study was to
provide descriptive information which could be used to make deci-
sions about RDDE activities and training programs, hypotheses were
not formulated. Instead, the following questions about RDDE person-
nel and their jobs were posed:

1. What are the general characteristics of vocational RDDE
   personnel?
   a. How many vocational RDDE personnel can be
      identified?
   b. Where are they located by address?
   c. How do they functionally classify their present
      job?
   d. What are their ages and proportions of males and
      females?
   e. What degrees do they hold?
   f. What are their majors and minors for their highest
      degree?
   g. In what professional associations do they hold
      memberships?
   h. How many years of previous work experience did they
      have in various work areas?
   i. To what extent do they agree with the defi itions
      of research, development, vocational education,
      etc., provided by the study?
2. What in-service training do they need?
3. What are their jobs like?
   a. In what type of institution are they working?
   b. What relative time do they spend on various job
      activities?
   c. What products and services are produced by the job?
   d. What job tasks do they perform on the job?
   e. What knowledges/skills do they use on the job?

4. How do vocational, non-vocational, and part vocational part non-vocational personnel compare with regard to the information collected?
5. How do persons who classify themselves as researchers, or developers, or diffusers, or evaluators compare with regard to the information collected?

The basic assumptions underlying these questions are that (a) lists of job tasks, knowledges/skills, and personal characteristics are adequate to reveal possible differences between job functions, (b) the lists used in the study are satisfactory for that purpose, and (c) the personnel surveyed can accurately describe and self-rate themselves and their jobs.

LIMITATIONS

One limitation of this study is that the procedures employed did not identify the entire population of vocational RDDE personnel. This is due to (1) lack of agreement about definitions of the terms research, development, diffusion, evaluation, and vocational education (such terms being used in identifying the population), (2) restrictions in the data collection procedures, and (3) application of a criterion defining the population in terms of the amount of time an individual spends on one or more of these research-related activities.

More particularly, the criterion used to define the population was that the individual must have spent an average of 25% or more time over the past two years or during the current year engaging in RDDE activities. This arbitrary level was chosen because 25% time represented a commonly used unit of measuring work time and therefore provided a readily applicable standard. A more

important reason for using the 25% time criterion, however, was
based on the belief that R,D,D, and E activities are relatively
complex, thereby requiring a reasonable amount of concentrated
time to be devoted to them. It seemed safe to assume that those
persons devoting 25% or more time to RDDE activities would be able
to understand and recognize most of the tasks and knowledges/skills
listed on the questionnaire.

A second limitation of this study may be imposed by the
terminology used to describe and discuss the field of educational
research and training. The terms research and/or research-related
personnel are used synonymously with the acronym RDDE. The use of
any of these terms in this paper should be interpreted as referring
to the field of educational research as a whole and, therefore,
includes the loosely defined job functions known as research,
development, diffusion, and evaluation at both the professional
and para-professional levels.

DEFINITIONS OF IMPORTANT TERMS

The following are the definitions of important terms used
in the study to define the key areas of concern.

Administration - referring to the direction, control, and manage-
ment of an organization.

Context - referring to the surroundings, environment, or particular
circumstances in which things occur.

Development - referring to "a coordinated set of activities which
produce reliable technology" (Schalock, 1972).

Diffusion - referring to "a coordinated set of activities which
lead to the adoption and/or utilization of generalizable
knowledge, reliable technology and trustworthy information"
(Schalock, 1972).

Evaluation - referring to "a coordinated set of activities which
produce trustworthy information in support of decision
making" (Schalock, 1972).

Field - referring to the single broad area of work of the educa-
tional professional.

In-service - referring to professional training activities designed
to up-date and up-grade ; person in the knowledges and
skills of a particular educational field and/or job function.

Job-function - referring to the particular type of work performed
by an individual, such work being given a specific, descrip-
tive title.

Knowledges/Skills - referring to the accumulated facts, information,
and truths which the mind has access to and to the ability
to put that information to use on the job.

Outcome - referring to the results of some type of activity.

Previous work experience - referring to any and all kinds of job
functions performed prior to the present job function.

Process - referring to all of the elements involved in activities
to accomplish some outcome.

Products and services - referring to the tangible physical out-
comes, and written and verbal communication between indi-
viduals, resulting from job functions.

Programs - referring to the general outline and specification of a
series of goals, procedures, results, etc. of a specified
set of activities.

RDDE - referring to "a coordinated set of strategies which produce
recognizable products that can be judged as to their quality
and contribution to the solution of an educational problem"
(Schalock, 1972).

Research - referring to "a coordinated set of activities which pro-
duce reliable knowledge, that is, facts, principles,
generalizations, theories, and laws that can stand the test
of empirical verification" (Schalock, 1972).

Task - referring to a specific job activity performed on the job.

Teaching - referring to the general activities, materials, pro-
cedures, etc. that facilitate learning.

Vocational education - training, retraining, or upgrading which is
given in schools, classes, or other locations (factories,
store front center, etc.), including field or laboratory
work and remedial or related academic and technical
instruction incident thereto, under public or private
(trade schools, union programs, business and industry
programs, etc.) supervision and control or under contract
with a state or local education agency, and is conducted
as part of a program designed to prepare or upgrade indi-
viduals for gainful employment as semiskilled or skilled
workers or technicians or sub-professionals in recognized
occupations and in new and emerging occupations, or to
prepare individuals for enrollment in advanced technical
education programs, but excluding any programs to prepare
individuals for employment in occupations generally con-
sidered professional or which require a baccalaureate or
higher degree.

Chapter 2

LITERATURE REVIEW

INTRODUCTION

When reviewing the literature a great number of theoreti-
cally oriented, opinion expressing, discussion-suggestion oriented
papers were noted; only a very few "manpower" studies, and two
(Schalock and others, 1972; Worthen and others, 1971) empirically
based studies dealing with the topic of educational research and
research-related (development, diffusion, and evaluation) personnel
were found.

The lack of empirical research dealing specifically with
the topical area of this study was not a hindrance, rather, it
reinforced the belief that studies of the type conducted are essen-
tial to the continued development and expansion of the research
training effort.

The literature made evident that there has been a sequential
development of activities dealing with the problems and programs of
research training. That sequence of activities has gone from
recognizing the need for national training programs, to actual
federal legislation which provided funds for and directed the
establishment of research training programs, to manpower studies
dealing with quantitative needs for personnel, to the point, today,
where it is felt that in-depth studies should be conducted to gather
information about educational RDDE activities and personnel.

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This review of literature attempts to discuss the papers
and studies dealing with RDDE personnel training programs as these
programs have developed during the seven year period since the
ESEA was passed.

REVIEW OF THE LITERATURE

In the <u>64th Yearbook of the National Society for the Study
of Education, Part I (1965)</u>, which dealt solely with the topic of
Vocational Education, a chapter by George L. Brandon and Rupert N.
Evans, "Research in Vocational Education," mentioned the fact that
"In addition to an effective recruitment service, the following
(and many other development activities) may be produced: ... 2.
Deliberate planned instruction in research in the professional
preparatory and in-service programs of teacher and supervisor edu-
cation. ... 9. Pre- and in-service program development of inter-
disciplinary research activities including research design method-
ology, and experimentation employed in the major disciplines and
professions" (National Society for the Study of Education, 1965:
271). In 1964 there was, therefore, some concern for training some
types of personnel in vocational education in the basics of research
processes.

Concern for the training of educational research personnel
was also shown at a national level by the Phi Delta Kappa Symposium
on the "Training and Nature of Educational Researchers, 1965." In
the book reporting the papers and discussions of the Symposium, the
sixth annual Phi Delta Kappa Symposium on educational research,

Egon G. Guba's summary listed eight strategies which were avail-
able for improving educational research training (Guba, 1965: 258).

It was probably these kinds of expressions about the need
for educational research personnel that led to the formulation and
passage of the Elementary and Secondary Education Act (ESEA) of
1965 with the all important Title IV, Research Training Programs
provisions.

This is not to say that concern for research training was
absent before 1964. Studies and/or papers by Lazarsfeld and Sieber
(1964), Stanley (1962), Cooley (1963), Tyler and Barron (1963),
Thistlethwaite (1962), Drevdahl (1961), Moore (1960), Brown and
Slater (1960), and even as far back as Sibley (1948), all added
knowledge and opinions to the discussion of the entire field of
research training. Not until 1965, however, did there appear to
be a more concentrated effort to study the field of educational
research training as a unified set of problems whose solutions had
long ranging consequences for the entire community of educators.

In 1965 Bargar and others (1965) identified and surveyed
the educational research community. The major outcome of the study
was the National Register of Educational Researchers (Bargar, 1966)
which not only listed the names and addresses of educational re-
searchers, but provided, according to one of the objectives of the
study, "...a description of certain professional characteristics of
educational researchers" (Bargar, 1966: V). The study (and
resulting directory) was designed "...first, to identify indi-
viduals in the United States who are now engaged in or who have

recently engaged in research in education, and second, to obtain
information from these individuals concerning their personal vita,
educational history, professional fields and subfields of identi-
fication, present positions and job history, and areas of research
activity" (Bargar, 1966: V). The study (and resulting directory)
was noteworthy because of its effort to help solidify the educa-
tional research community and establish lines of communication
within that community which could only add to the further develop-
ment and improvement of educational research and educational
researchers.

In the years since 1965 (mainly in 1966 through 1970) a
number of studies have been conducted to investigate the training
of researchers and research-related personnel. All of these studies
have focused on three areas of investigation:

1. characteristics of the institutions preparing educa-
    tional research personnel (e.g., organizational
    arrangements for research, faculty conducted research,
    faculty-student interface, and numbers and types of
    research personnel trained by various institutions).

2. characteristics of the programs for training research
    personnel provided at the institutions offering
    "research training programs" (e.g., types of course
    work and experiences).

3. characteristics of the trainees participating in the
    training programs (e.g., I.Q., marital status, emo-
    tional stability, undergraduate work, degrees possessed,
    recruitment procedures, selection procedures and
    criteria, degree programs chosen, and experiences in
    other areas of research and work).

Studies and papers dealing with the first area, institu-
tional characteristics, include those by Buswell and others (1966),
Sieber (1966), Lazarsfeld and Sieber (1964), Heiss (1966),

Brown and Slater (1960), and Thistlethwait? (1962). These studies,
although they have added greatly to knowledge about the educational
research community and its training programs, say nothing about
describing the tasks which RDDE personnel perform on their jobs as
a means of designing training programs. Rather, they merely
described the status of institutions at which research training
occurs.

Although the studies dealing with trainee characteristics
also contributed to the knowledge about research training activi-
ties, they too did not study actual RDDE activities. The studies,
which include those by Taylor and Barron (1963), Cooley (1963),
Drevdahl (1961), Moore (1960), Clark (1966), Stanley (1967),
Buswell and others (1966), Gardner (1967), Bidwell (1967), and
Sieber (1966) were very interesting in that they investigated the
characteristics of research trainees and made a number of sug-
gestions concerning the desirable qualities of future research
trainees as inputs to the training process.

The last area of study, program characteristics, deals with
the process of conducting research training programs. The work by
Krathwohl (1965), Sieber (1966), Drevdahl (1961), and Guba (1965)
aptly described the process of research training programs, but did
not link them to what goes on out in the "real world" of actual
RDDE activities.

As can be seen, a number of the studies noted (e.g.,
Drevdahl (1961), Clark (1966), Buswell and others (1966), Sieber
(1966)) overlap the three areas of investigation. What is missing

from the total picture, however, are studies of the input, process
and product relationships.

Looking more closely at some of the reports mentioned above,
it is possible to discern the beginning of the sequence of thought
about how the field of educational research training might be
further studied and developed.

Sieber (1966) mentioned in passing that "experience" (as
opposed to text teaching) is an important consideration in training
research personnel, but he did not say how one would go about
finding out what kinds of "experience" are essential to producing
a "good" researcher.

Buswell and others (1966) studied research personnel who
obtained doctorates between the years 1954 and 1964 and gathered
information about their location, type of work, opinions about
research, etc., but, as others, they did not gather information
about the types of tasks these people performed in their work, nor
the types of knowledges/skills they possessed.

Clark's (1966) paper was one of the first to mention that
the educational community must somehow learn more about the educa-
tional research process and about educational researchers. He stated
that all trainers of researchers should be knowledgeable about
research and research-related processes. Regarding research
training programs, he stated quite frankly, "Every research planner
has to face questions of program objectives, student selection, and
program elements and experiences either explicitly or implicitly
and we have been too willing to settle for the latter" (Clark,

1966: 89). Here, for the first time, was an implication that the educational research community must take an explicit, detailed look at research and research training activities.

In 1967 a very brief, but comprehensive, discussion of the preparation of research personnel for education was published jointly by Phi Delta Kappa and the American Educational Research Association (Clark and Worthen, 1967). The discussion and presentation hit upon most of the problems of educational research training, but as with most other studie, and discussions, it failed to indicate what effect knowledge about the actual activities of RDDE personnel might have on solving some of the problems of research training.

It was in early 1969 that the real challenge for research activities dealing with research training was made. Fleury and others (1969) indicated in their report of a study of research trainees (as of 9/1/66) that "There is a paucity of research on research training. The published research studies are descriptive of practices of schools of education which relate to the production of educational researchers and to research productivity of such personnel" (Fleury and others, 1969: 10). Although their study dealt with entrance requirements and success in completing research training programs, the call was made for more and more encompassing research on research training.

As is often the case, when a call is made for more research in an area in which little has been done previously, someone is usually already at work on it. In 1969 the well-known Clark and

Hopkins study of research, development, and diffusion manpower was published and showed the extent to which other studies could be made to add to and expand the voluminous knowledge compiled by it.

One of the original objectives of the study was to "Identify existing and emerging roles and required skills and behavior for research and research-related personnel in education" (Clark and Hopkins, 1969: 5). This objective, however essential it was (and currently is) to determine the nature of training programs, was deleted from the study. Instead, the study had to "...deemphasize the delineation of skills and behaviors requisite to the roles and substitute for this a much more detailed manpower resource pro- jection. Such information seemed more useful for planning and decision making purposes, particularly at a national level" (Clark and Hopkins, 1969: 8).

It was unfortunate that the study did not undertake a de- lineation of skills and behaviors, but that type of investigation was put off until recently when other studies have attempted to provide such information. The Clark and Hopkins study did, how- ever, provide a great deal of manpower information based on then current numbers of research, development, and diffusion personnel and projected funding levels for RDD activities. Their projections estimated that the "demand for trained R, D, and D personnel in 1974 was likely to be five times the 1964 demand. In other words, there would be a demand for about 19,000 RDD personnel in 1974 as compared with 4,000 personnel in 1964. Even their least likely projection of three times as many personnel (e.g., 12,000) gave an

indication of the need for more research training efforts and the implication that more must be learned about research training programs if they are to meet that demand efficiently.

It should be noted that the Clark and Hopkins projections were based mainly on previous patterns for funding educational research as compared with projected funding patterns. The more recent study by Worthen and others (1971) updated the Clark and Hopkins projections for 1974 RDDE manpower. In light of changes in funding patterns for RDDE activities many of the assumptions on which those earlier projections had been made were invalidated. Thus, the newer projection estimated that the demand would be only two times as great (8,250) as the number of RDD personnel found in 1964 (4,125). Even with the current projections there still appears to be a demand for research dealing with research training if the qualitative outputs of the programs are to be satisfactory and the programs are to be efficient.

In the Bargar and others (1970) study, mention was made of training programs, knowledges and skills or skills competencies needed, and behaviors related to RDDE tasks or activities, but no discussion was provided concerning how the competencies were determined.

The most encompassing discussion about the need to study research training came in 1970 with the publication of a paper by Guba and Gephart. The following series of quotes from that paper clearly reveal the current status of knowledge about RDDE training.

Discussing the overall program of RDDE activities in education, Guba and Gephart stated:

> Funding is indeed as important as an input in the system that generates knowledge about education and converts it to practice. Of equal importance are personnel, the human agents of the system who invent, develop, and implement ideas for change and improvement. A fairly large number of personnel to guide and participate in educational improvement must be recruited and trained if the available funds are to have the desired impact (pp. 2).

In regard to the RDDE personnel situation they stated:

> The current personnel and personnel training situation in the research, development, diffusion, and evaluation (RDD & E) areas can be characterized as desperate. This is true because of:
> 1. <u>Existing shortages</u>...
> 2. <u>Insufficient numbers being trained</u>...
> 3. <u>Gaps in existing research training</u>...
> 4. <u>Lack of middlemen training programs</u>...
> 5. <u>Lack of training materials and trainers</u>... (pp. 2-4).

The authors went on to say that:

> Efforts to mount RDDE programs are likely to flounder on two counts. First, very few substantive data are available regarding the gaps and deficiencies in existing <u>traditional</u> educational research training programs and very little is known about the nature and needs of emergent educational development, diffusion, and evaluation roles (pp. 4).

In summing up the description of their <u>G</u>eneration and <u>C</u>onversion of <u>K</u>nowledge to <u>E</u>ducational <u>P</u>ractice (GCKEP) model, the authors stated:

> Legitimate questions have been raised about the quality and effectiveness of research training. How many solid empirical studies have been done on the skills needed to engage in research? (pp. 60).

> A long range goals part of the system includes a general category goal of studies which will delineate the nature of the research and research-related processes, the settings in which they are appropriate, and the skills and knowledge needed for engaging in those processes (pp. 71).

> ...additional studies need to be commissioned to fully
> establish the set (or sets) of needed skills and
> knowledge (pp. 72).

Their call for more studies about research and research-

related processes was based on the underlying thesis:

> ...that knowledge of the research and research-related
> processes, the skills necessary for participating in
> them, and the means for creating those skills has been
> accumulated through unsystematically analyzed experi-
> ence and through logical analysis. Empirical
> documentation is required and should be generated by
> a long term targeted research and development program
> (Guba and Gephart, 1970: 76).

Clearly Guba and Gephart hit the proverbial nail on the head

when they indicated a need for the research community to take an

empirical look at itself and its training programs in order to pro-

vide properly trained personnel.

In developing a functional competence training program for

DD and E professional and paraprofessional personnel, Hood and

others (1970) further stated the case for the essential need to do

on-the-job (or in the actual or real world) studies of RDDE per-

sonnel in order to make training programs realistic. They stated,

"Ideally, for maximal instructional efficiency, the elements in the

curriculum and in the real world should correspond one to one, while

the training course as actually taught should cover some portion of

them..." (Hood and others, 1970: E 2). They also stated, "Only

training objectives which are established in direct response to the

results of a job or task analysis will provide a firm, job oriented

basis for the development of a training program (Hood and others,

1970: E 1). Clearly, the need for going into the world of work

of RDDE personnel and studying them and their activities is

indicated as a necessity to realistic training programs for such personnel.

In late 1970 two proposals for just the type of research activities called for by Guba and Gephart (1970) and Fleury and others (1969) were submitted to the United States Office of Education. Both of these proposals, which resulted in two very recent reports which are not yet generally available (Worthen and others, 1971; Schalock and others, 1972), had as major objectives the determination of the tasks of RDDE activities and the determination of the skills and knowledges or competencies that research and research-related personnel need in order to perform RDDE activities.

The proposal for the Worthen study stated, "Lack of knowledges about 'training variables' is undoubtedly the greatest impediment to planning training programs that will not only provide sufficient initial training to researchers and related personnel but also provide sufficient in-service training to prevent obsolescence and continually upgrade skills" (Worthen and Byers, 1970: Appendix J, pp. 6).

It is unfortunate that the final reports from the Colorado (Worthen and others, 1971) and Oregon (Schalock and others, 1972) projects are not yet available for review. In two very brief papers (Worthen, 1972 and Ammerman, 1972) presented at the 1972 American Educational Research Association (AERA) Convention both the Colorado and Oregon studies reported their methodology, sample, and general types of data collected, and also indicated that it would be necessary to read the reports to get the total picture of

the results of their studies. All they could generally indicate
was the fact that new insights into RDDE activities, personnel,
and training programs had been gained which should be very bene-
ficial to improving RDDE training.

Other papers delivered at the 1972 AERA convention (Heathers
and others, 1972; Hood, 1972; and Ward, 1972) all indicated a need
to study job tasks and knowledges/skills or competencies of RDDE
personnel and activities in the world of work as a means of gaining
better understanding of the nature of RDDE training programs.

SUMMARY

In summarizing the literature, it is apparent that there
has been a sequential development of ideas and actions concerning
the field of educational research, development, diffusion, and
evaluation activities, personnel, and, since 1965, training pro-
grams. From the stage of discussing RDDE activities and who were
performing such activities, to the stage of developing training
programs, through the present stage of discussing and studying
RDDE activities, the central theme has been a desire to acquire
more and better empirical information that will tie training
efforts to the actual needs of the field. As a result, the edu-
cational RDDE community should be able to confidently state what
it is doing, using well defined and accepted terminology, it should
be certain that what is is doing is consistent with the overall
goals and problems of the national educational system, and it
should be confident that the training programs it provides are

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consistent with the quantitative and the qualitative needs of the
real world of work of RDDE activities.

The literature reviewed supports the idea that the RDDE
community is gradually advancing its knowledge about its own
activities and personnel and, in so doing, contributing greatly
to the improvement of RDDE training programs.

Chapter 3

DESIGN OF THE STUDY

POPULATION IDENTIFICATION

In order to identify a population of vocational education
RDDE personnel (generally thought to be approximately four hundred
in number), several methods were employed.

First, 167 letters were sent (and several phone calls made)
requesting individuals at the types of institutions listed below
to identify the names and addresses of as many people as they could
who they believed had conducted or were conducting RDDE activities
in vocational education.

1. USOE Bureaus, Divisions, and Branches
2. State Departments of Education (Vocational-Technical
   Division, and Research Divisions)
3. State Research Coordinating Units for Vocational
   Education
4. Regional Laboratories
5. The Center for Vocational and Technical Education
   and the North Carolina Center for Occupational
   Education
6. Professional Education Associations (e.g., AERA and
   its Significant Interest Group on Vocational Education;
   American Vocational Educational Research Association)
7. Private Foundations (e.g., Ford, Kettering)
8. Business and Industry Foundations, Associations, and
   Corporations (e.g., Rand, AIR)
9. Colleges and Universities
10. U. S. Department of Labor, and National Science
    Foundation
11. Other miscellaneous organizations and persons.

A copy of the general format of the letter sent to persons in the

listed institutions is found in Appendix A.

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No definitions of R, D, D, or E were given to direct and/ or limit the response of the person contacted. Instead, it was assumed that the general, broadly used definitions of R, D, D, and E would be understood by those persons contacted and thereby would allow them more latitude in identifying individuals conducting RDDE activities than would have been possible if stricter, narrower definitions had been provided.

The second method of identifying the study population was to review research indexes to identify names of individuals who had recently completed an RDDE activity in vocational education. The publications consulted were the following:

1. Manpower Research Reports, U. S. Department of Labor
2. Dissertation Abstracts
3. Research in Education (RIE), ERIC Central
4. Abstracts of Research and Related Materials in Vocational and Technical Education (ARM), ERIC Vocational-Technical Education Clearinghouse.
5. Abstracts of Instructional Materials in Vocational and Technical Education (AIM), ERIC Vocational-Technical Education Clearinghouse
6. Selected reviews, syntheses and bibliographies of research, development, diffusion, and evaluation activities in vocational education.

Since many of the documents listed in these publications were reporting projects whose results happened, incidentally, to be of interest to vocational education, many authors would probably not be classified as vocational RDDE personnel for the purposes of this study. The difficult part of reviewing these publications, especially the ARM and AIM publications, was making the decision about whether or not the persons identified should be classified as vocational education RDDE personnel.

Selecting persons to be included in the population in this manner would have been extremely difficult had it not been for the fact that duplication of names in these publications, when compared with the names obtained from other sources which more positively identified individuals as vocational education RDDE personnel, cut the number of decisions down considerably.

A third method of identifying the population was to obtain a list of personnel conducting USOE funded projects dealing with vocational education RDDE activities.

Finally, the fourth method of identifying the population more completely was to request those persons identified by the previously mentioned three methods to complete question twenty-seven on the mailed survey questionnaire and indicate the names and addresses of any persons they knew in their immediate geographic area who were spending 25% or more time on vocational RDDE activities. This fourth method of identifying a population was employed since the investigator believed that knowledge about who is doing what in local geographic areas is best known to persons in that area.

SURVEY QUESTIONNAIRE ITEM IDENTIFICATION, PILOT STUDY, AND FINALIZED FORMAT

Item Identification

In order to determine the questionnaire items that might be used to gather information about the personal background, jobs, and training needs of active vocational RDDE personnel (and answer

the questions set by this study in Chapter 1) a review of recent

papers and studies which had collected the following kinds of

information was made:

1. age and sex
2. degrees held, and majors and minors of highest degree
3. association memberships
4. types and years of previous work experiences
5. places of employment
6. classification of job function and educational field
7. tasks performed on the job
8. knowledges/skills possessed and/or used on the job
9. products and services produced by the job
10. in-service training needs

The greatest help in identifying types of items was obtained from

reviewing the in-progress work of the Oregon (Schalock and others,

1972) and Colorado (Worthen and others, 1971) studies since they

dealt directly with the types of information this study sought to

gather. The large majority of task and knowledges/skills items

finally utilized in this study came from those two projects, with

other questionnaire items being formulated by the investigator as

needed to aid in classifying and describing the vocational educa-

tion population.

The items from the Colorado and Oregon projects were

probably far superior to any lists of items the investigator could

have constructed independently since these studies had theoretically

determined tasks and knowledges/skills lists and empirically tested

those lists. In addition, by utilizing many of the same items, the

results of the three studies may better be compared.

Note should be taken of the fact that the content of this

study was to deal with vocational education RDDE personnel and not

with general education RDDE personnel as did the Colorado and
Oregon studies. However, since the investigator assumed that the
activities involved in R, D, D, and E (if not their relative
emphases) spanned the "differences" between the vocational and
non-vocational education fields, the use of tasks and knowledges/
skills lists designed for studies of non-vocational RDDE personnel
could quite appropriately and properly be used in the study of
vocational RDDE personnel. Before actively utilizing items from
the Colorado and Oregon projects, however, the lists of tasks,
knowledges/skills, and other questionnaire variables were circu-
lated among a pilot study group (described in the next section) of
vocational personnel for their comments, suggestions, criticisms,
and additions in order to insure an inclusive set of tasks, etc.
relevant to vocational RDDE activities.

Note should also be taken that the investigator advanced
no hypotheses concerning the relationship between tasks performed
and knowledges/skills utilized. Although relationships should
exist between tasks performed and the knowledges/skills requisite
to performing those tasks, it was not the purpose of this study
to investigate that relationship.

Pilot Study

A pilot study involving the participation of eighteen voca-
tional education RDDE personnel in the Minneapolis-St. Paul,
Minnesota metropolitan area and several out-of-state persons was
conducted to determine the effectiveness of the cover letter and

the fifteen page survey instrument designed to collect the data about vocational education RDDE personnel and their jobs.

The participants in the pilot study were requested to review the documents and to make any comments they wished regarding pertinent changes and/or additions to improve the questionnaire's clarity, format, instructions, style, items, variables, etc. The comments from this group were utilized to create an instrument which would most effectively achieve the objectives of the study.

Finalized Format

Two final forms of the questionnaire, one long-form (Appendix B) and one short-form (Appendix D), along with the necessary cover letters, instructions, and return-mail procedures and material were developed.

The long-form questionnaire (15 pages) was sent as the first attempt to collect data. After a post-card reminder-to-participate was sent as a first follow-up, the second follow-up consisted of sending the short-form questionnaire (9 pages). The short-form questionnaire was utilized as a means of collecting data from non-respondents who may not have completed the long-form questionnaire primarily because of a lack of time to participate and/or interest in the survey.

This procedure is a departure from standard survey methodology. The short-form questionnaire did not collect as much data as one might like, but it did obtain data which helped to identify and classify the population under study; also, the method helped

to account for members of the population, thereby making any inferences about the total population more accurate.

In addition to the two mailed survey questionnaires, a telephone interview schedule was constructed. (See Appendix E for an example of the interview schedule.) This was used by a tele-phone interviewer calling a stratified random sample of non-respondents. The interview schedule collected data which classified non-respondents and described a few of their basic characteristics (e.g., highest degree held, place of work, job function, and educational field).

DATA COLLECTION

The data collection procedures for this study consisted of the five phases described below.

Phase I

After identification of a potential population consisting of 1,568 persons, the fifteen page, long-form questionnaire and cover letter (see Appendix B for examples) along with a first-class, business-reply envelope (9 x 11 manila) were sent via first class mail to that group. The persons receiving the survey questionnaire were asked to complete it according to the instructions provided and to return it within one week.

The questionnaires were sent December 6, 1971.

Phase II

Five weeks after the mailing of the long-form questionnaire a second mailing of that questionnaire, utilizing the same procedures as outlined in Phase I, above, was made. In this phase of data collection the group consisted of 394 new persons who had been nominated (as persons spending 25% or more time on RDDE) by those persons responding to the Phase I mailing within the five week period, December 10, 1971 to January 10, 1972.

The questionnaires for the Phase II mailing were sent January 10, 1972.

Phase III

Six weeks after the mailing in Phase I, a follow-up reminder-to-participate postcard (see Appendix C for an example) was sent to all those persons on the Phase I mailing list who had not responded. This mailing consisted of a first-class mail postcard reminding them of the questionnaire sent to them and urging them to participate in the study by completing the questionnaire, or at least sending back the return mail envelope with a note indicating that they did not wish to participate in the study. The postcard was sent to approximately 900 non-respondents of the 1,568 persons on the Phase I mailing list. Postcards were not sent to any of the persons on the Phase II mailing list because of the recency of mailing the questionnaire to them.

The postcards were sent January 14, 1972.

Phase IV

Eleven weeks after the Phase I mailing, six weeks after the Phase II mailing, and five weeks after the Phase III mailing, the follow-up, nine page, short-form questionnaire and cover letter (see Appendix D for examples), along with a return envelope, were mailed to all those persons from the Phase I and the Phase II mailing lists who had not responded to the questionnaire and/or follow-up postcard. Approximately 1,000 follow-up questionnaires were sent to non-respondents from the combined Phase I and Phase II mailing lists, which totaled 1,962 persons.

The short-form questionnaires were sent February 18, 1972.

Phase V

The deadline for data to be analyzed was set at nineteen weeks after the original mailing of the Phase I, long-form question-naire and eight weeks after the mailing of the Phase IV follow-up, short-form questionnaire.

During the weeks after the data return deadline, a strati-fied (by state) random sample of one hundred (100) non-respondents from the combined Phase I and Phase II mailing lists was selected to contain two non-respondents from each state. This sample of non-respondents was then interviewed by telephone in order to gather some data describing the characteristics thought essential to classify non-respondents. A sample of the telephone interview questionnaire is found in Appendix E. Sixty-four (64%) of the sample of 100 were interviewed. Thirty-six of the sample were no

longer at the location phone and could not be traced to a new location.

The data return deadline was April 14, 1972. The phone interviews were conducted April 17 through May 12, 1972.

Phases I to V: Working Rules

During the potential population identification and data collection phases of the study, the essence of the ground rules was simply that every reasonable effort would be made to correctly identify persons ᵇ name, title, and location and that if the original identification process was in error every reasonable effort would be made to correct it.

Given the fact that the identification of the potential population took place in August through October, 1971, the mailing lists should not have been out-of-date to any great extent. If the addresses were out-of-date. however, it was believed that the first-class mailing procedures assured forwarding to a new address. Any mail returned as being non-forwardable or as addressed to someone at a particular institution who was no longer there, unknown, and/or whose present "new" whereabouts were unknown, caused the person addressed to be classified as non-locatable. No further attempt was made to locate that person.

If a person could not be located by phone because he or she was no longer at a particular institution and could not be traced to a "new" location, that person was also classified as non-locatable.

Although these ground rules caused approximately 210 of
the total identified potential population of 1,962 to be classified
as non-locatable, and ruled out any further attempt to reach them,
it was necessary to do this given the time, personnel, and finan-
cial constraints of the study, and the extreme difficulty of
locating people who could not be found by the forwarding of first-
class mail method and/or by using colleagues with whom, and
institutions at which, they previously worked to identify their
new whereal .uts.

Chapter 4

DATA ANALYSIS

INTRODUCTION

In analyzing the data resulting from the procedures out-
lined in Chapter 3, three methods were utilized. This chapter
describes these three data analysis methods.

The statistical analyses described in Methods I and II were
performed by using the Statistical Package for the Social Sciences
(Nie and others, 1970) computer programs (MARGINALS and CODEBOOK
programs for Method I and FASTABS program for Method II).

The University of Minnesota Computer Center (UCC), Control
Data Corporation (CDC) 6600 series computer was used to analyze the
data.

The analysis described in Method III was performed by the
United States Department of Defense, Marine Corps, Computerized
Occupational Data Analysis Programs (CODAP) (Oats-Hills Consultants,
1970) utilizing an IBM 360 series computer.

In discussing the analyses of data, the term variable
(abbreviated VAR and followed by a 3 digit number) will be used to
refer to specific items on the questionnaire. Reference to item
numbers on the questionnaire is made with each variable number since
variable numbers were assigned for analysis procedures only and
were not indicated on the questionnaire. Reference should be made

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to Appendix F for a complete cross reference of questionnaire
items, the names of variables, and data analysis variable identi-
fication numbers (VAR _ _ _).

METHODS OF ANALYSIS

Method I

This method consisted of obtaining a descriptive enumera-
tion of the responses to variables which required only a numerical
response or the checking of a response, and excluded write-ins.
The enumerations consisted of frequency counts, and relative and
cumulative percentages. In addition, whenever it was appropriate
(e.g., for age, years of previous work experience, agreement with
definitions), means, modes, medians, ranges, standard deviations
and variances were computed.

Method I was used on all the variables in the study as a
means of examining the characteristics of the distribution of
responses.

Method II

This method consisted of performing cross-tabulations or
producing contingency tables. For example, the method cross-
tabulated the responses to variable 49 (question 16) with the
responses to the TASK variable 59 (question 20.A.1).

The contingency tables or cross-tabulation matrixes pro-
vided for each cell the raw frequency count, row percents, column
percents, and percent of total, and also provided the marginal

totals and percents. (See Appendix G for an example of a typical cross-tabulation table output.)

In addition to the display of data provided by this method of analysis, statistical tests were performed on the table data to·determine the probability of obtaining the observed distribution of responses among the table cells based on the distribution one would expect from the marginal totals. The statistical test employed in this case was the Pearson Chi Square test of association. It tested the independence (or lack of statistical association) between the two variables being cross-tabulated. (See Appendix H for statistical formulas.) The test was applied to all contingency tables whenever frequency counts permitted (e.g., all cells had expected frequencies greater than 5). For 2 x 2 tables, the Yates' corrected Chi-square was applied. If there were fewer than 21 cases in the 2 x 2 tables, Fisher's exact test was utilized.

The cross-tabulation and Chi-square analysis method was mainly applied to those variables dealing with tasks and knowledges/skills (VAR 059 to VAR 239), although the method was also applied to other nominal data in order to identify and compare some of the characteristics of response groups (e.g., vocational researchers, non-vocational researchers, etc.).

The level of significance chosen for the Chi-square tests was the conventional .05 level (reported as p≤.050).

Method III

The third method of analysis consisted of what might be called job duty and task clustering or grouping processes. For a

detailed explanation of the mathematical-computerized method used consult the CODAP manual (Oats-Hills Consultants, 1970).[1] The CODAP system has been mainly used by the United States Armed Forces to provide job description information for their personnel training programs for various Armed Forces jobs.

The system utilizes a high speed computer to produce an optimum solution for a hierarchical structure of job duties and tasks as defined by the investigator. "In CODAP, a solution is one which identifies a job, that is separates the work into positions requiring various constituent duties, tasks and elements, indicating the scope of the tasks encompassed and distinguishing a given job from all other jobs to some desired degree. The result is called a job description. What the computer cannot do is tell whether the job descriptions are good or bad except in relationship to other established scales of judgement. Hence, final evaluation is essentially a human action rather than a computerized fact" (Oats-Hills Consultants, 1970: 1-2).

SUMMARY

Both the Chi-square and CODAP analyses were utilized to provide evidence showing relationships and/or differences between the response groups (e.g., vocational, non-vocational, research,

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[1]For those interested in the concepts of clustering and the applications of the CODAP system they are referred to: Department of the Air Force, Air Force Human Resources Laboratory (AFSC), Occupational Research Branch, Personnel Research Division, Lackland AFB, Texas 78236, Attn: HRPO, for complete listing of AFHRL publications.

diffusion, ètc.). These analyses were performed in order to pro-
vide evidence which might indicate the existence of distinguishing
characteristics which could possibly be used to classify and dif-
ferentiate among job functions and job fields, as well as to define
tasks and knowledges/skills clusters for the various job functions
and job field groups.

Chapter 5

FINDINGS

Seven sections are used to report the actual data from
the study. The first section presents the results of locating the
vocational RDDE group and response rates. The second section
describes and compares the response group's general (personal)
characteristics. The third section describes and compares the in-
service training needs of the response groups. The fourth section
describes and compares the job description data, while the fifth
section describes and compares the job tasks and knowledges/skills
data. The sixth section reports the results of the clustering
analysis of tasks and knowledges/skills variables. Finally, the
seventh section reports the non-respondent telephone interview data.

NOTES ABOUT TABLES

First, note should be made before reading any of the
tables that any discrepancies between the number of respondents
reported for "all respondents" and those reported for various sub-
classifications (e.g., vocational, non-vocational, vocational
research, etc.) were due to incomplete responses to items on the
questionnaire. Items not completed were classified as missing
data.

The following example should help clarify the reasons for
the discrepancies. If the responses to three variables were

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VAR-A = 1, VAR-B = 2, VAR-C = no response, then the data were

accounted for in the following manner:

All Respondents Tabulations	Counted as Response	Counted as Missing Data
VAR-A	X	-
VAR-B	X	-
VAR-C	-	X
Cross-Tabulation Tables Involving the Three Variables		
VAR-A x VAR-B	X	-
VAR-A x VAR-C	-	X^*
VAR-B x VAR-C	-	X^*

*Even though the respondent has a response to VARS A
and B, he will not be counted as a response in any
cross-tabulations involving VAR-C since he did not
respond to that item.

Second, two tables in the sections dealing with respondent's

characteristics, in-service training, and job descriptions were

used to summarize the data and to show the results of the analyses

performed for each of the variables listed in those sections. The

first table in each pair summarized the data for all respondents

(N=786) classified by educational field. The second table pre-

sented a summary of the data which more directly focuses on the

major concerns of this study; that is, the data were reported for

only respondents who classified themselves as either researchers,

developers, diffusers, or evaluators from either the vocational or

the non-vocational educational fields (N=212).

Because of insufficient numbers of respondents and/or the

likelihood of respondents answering more than one category in the

item, statistical tests were not applied to the data about age

(Table 8), degrees held (Tables 9 and 10), major for highest

degree (Tables 11 and 12), minors for highest degree (Tables 13 and 14), professional organization memberships (Tables 15 and 16), years of previous work experience (Table 18), agreement with definitions (Table 20), in-service training needs (Tables 23 and 24), place of work (Tables 25 and 26), percent time on present job activities (Table 28), and job products and services (Tables 29 and 30). However, the summarized data are presented in the tables, and a brief subjective examination of those data is presented in the text accompanying the tables.

In reporting the data, the main concern was its relationship to questions 16 (VAR049) and 17 (VAR050). These items classified respondents by job functions (e.g., research, development, etc.) and by educational field (e.g., vocational, non-vocational, etc.). The major emphases of the study were to describe the population which performed various job functions in vocational education and to compare these persons across job functions and with persons in the non-vocational fields.

DESCRIPTION OF THE GROUP SURVEYED

Locating the Group

One-hundred and sixty-seven letters requesting the names and addresses of persons conducting RDDE activities in vocational education were sent. There were 91 responses (a 54% response rate) to this letter (see Appendix A for sample letter). The numbers of responses from the different resource groups utilized are shown in Table 1.

TABLE 1

TABULATION OF RESPONSES TO NAME-SEARCHING LETTER

Resource Groups	Letters Sent	Responses Returned	% Return
Special Organizations	7	6	85
RCU Directors	48	31	64
Associations	45	26	57
State Departments of Education	54	23 .	43
Special Persons	13	5	38
Total	167	91	54.4

The responses from all resource groups was quite high, given the nature of the request. It should be noted that all responses did not necessarily provide names and addresses, but in most cases an indication of where one might seek such names and addresses was given.

From the response-letters to the request for names and addresses and from the search of various publications, organizational mailing lists, and funded projects lists, a group of 1,568 persons possibly engaged in vocational education RDDE activities was identified.

A second, additional list of vocational education RDDE personnel was made in January, 1972 after receiving 665 returned questionnaires from the first mailing of 1,568. Some of those 665 responses listed, as requested by question 27, the names and

addresses of persons in their geographical area who were spending 25% or more time on RDDE activities. From the names provided an additional 394 persons, not on the original list of 1,568 persons, were identified and included in the group surveyed.

· The total group identified by this study, then, consisted of 1,962 persons who, at least potentially, were engaged in vocational education RDDE activities. All 1,962 persons were surveyed by the study.

In the group surveyed, over 33% came from the following states: Ohio (102), New York (92), California (79), Pennsylvania (75), Florida (71), North Carolina (65), Wisconsin (57), New Jersey (27), and Texas (23). As is readily seen, the distribution of personnel identified as being active in vocational education RDDE is quite diverse across the United States.

Survey Response Rates

As of May 31, 1972, 1,253 persons (63.9%) of the total identified group surveyed of 1,962 had been accounted for in some manner. Seven-hundred and eighty-six (62.7%) of the 1,253 persons indicated they spent 25% or more time on RDDE activities and, therefore, provided on the mailed questionnaires data about themselves and their jobs, while 344 persons (27.5%) indicated they spent less than 25% on RDDE activities and, therefore, provided no data. An additional 43 persons indicated a desire not to participate in the study, while 16 more returned the questionnaire after the deadline for accepting data. In a subsequent telephone survey

of 100 non-respondents 64 provided a small amount of data. This total group of 1,253 persons was classified as the "accounted for" part of the group surveyed.

The remaining 709 persons (36.1%) in the total group surveyed were classified as "not accounted for". No information about this group was collected. Two-hundred and ten (10.7%) of those not accounted for were not located by any direct method such as forwarding of first class mail or by telephone number referral. Four-hundred and ninety-nine persons gave no response whatsoever.

The response rates to the survey were considered reasonable given the fact that both questionnaires were lengthy (the original, long-form questionnaire involved nearly one hour of time to complete).

Table 2 (see following page) presents the accounting of the total group surveyed.

CHARACTERISTICS OF RESPONDENTS

The first table to present data describing the characteristics of the respondents shows how they classified themselves according to job functions and educational fields variables, VAR049 and VAR050, respectively. Table 3 indicates that a large number of respondents classified themselves as persons performing a combination of job functions. It was not surprising to find that a large number of persons who spent 25 percent or more time in research-related activities indicated they performed a mix of R, D, D, and E job functions as well as administrative and

TABLE 2

ACCOUNTING OF TOTAL GROUP SURVEYED

(N = 1,962)

| | Accounted for (n₁=1,253) | | | | | Not Accounted for (n₂=709) | |
	Mail Survey				Telephone Interview	Unlocatable[2]	No Response
	25% or More Time in RDDE[1]	Less Than 25% Time in RDDE	Chose Not to Participate	Data Rec'd Past Deadline			
Number	786	344	43	16	64	210	499
% of n₁	62.7	27.5	3.4	1.3	5.1	---	---
% of N	40.00	17.5	2.2	0.8	3.3	10.7	25.4

Notes: 1. Those respondents indicating 25% or more time spent on RDDE activities filled out the questionnaire and provided the data analyzed and reported in the remainder of this chapter. This number included 583 respondents to the long form and 203 to the short form of the questionnaire. These numbers do not include the 64 telephone interview respondents who provided very limited amounts of data.

2. Unlocatable refers to those persons who were no longer at the address or phone number on this study's mail-address-phone list and could not be located in any simple, direct manner by the post office (forwarding mail) or by the staff of the institutions at which the persons were previously located. This number includes 174 persons not located by any of the mailed survey items (returned to the study with appropriate indicators of the status of the addressee) and 36 persons not located at the phone location indicated for the non-respondent follow-up telephone survey.

TABLE 3

JOB FUNCTION BY JOB FIELD: CROSS-TABULATION FOR ALL RESPONDENTS

Field	Research	Development	Diffusion	Evaluation	Teaching	Administration	Other	Combination	Missing	Total
Voc Ed	51	60	19	25	38	44	3	132	1	373
% of N	6.4	7.6	2.4	3.1	4.8	5.6	.3	16.7	.1	47.4
Non Voc Ed	22	17	3	15	22	21	2	45	-	147
% of N	2.8	2.1	.3	1.9	2.8	2.6	.2	5.7	-	18.7
Part Voc Ed Part Non Voc Ed	30	29	4	12	23	33	3	111	2	247
% of N	3.8	3.6	.5	1.5	2.9	4.2	.3	14.1	.2	31.4
Missing Data	--	--	--	--	--	--	--	--	19 2.4	19 2.4
Total	103	106	26	52	83	98	8	288	22	786
% of N	13.1	13.4	3.3	6.6	10.5	12.4	1.0	36.6	2.8	100

teaching functions, given the nature and variety of places where RDDE activities usually occur.

Table 4 presents the job function and educational field cross-tabulations for only persons who specialized in either research, development, diffusion, or evaluation in vocational or non-vocational fields.

Chi-square analysis of data in Table 3 (test of independence) indicated no statistically significant relationship between the job function variable and the educational field variable. Analysis of the data in Table 4 indicated no statistically significant relationship between the R, D, D, or E job functions and the vocational and non-vocational education fields.

The major emphases of this study focused upon RDDE functions within the vocational education field and between the vocational and non-vocational education fields. The numbers of respondents shown in Table 3, however, who performed combinations of functions in all three educational fields as well as the numbers of respondents who classified themselves as partly in vocational education and partly in non-vocational education fields should not be ignored. Consequently the investigator performed two generalized analyses of the personal characteristics of the respondents. First, utilizing all respondents who perform research-related functions 25 percent or more time (N=786), their characteristics were summarized by and comparisons were made between educational fields, with all job functions (e.g. research, development, teaching) collapsed. Second, the personal characteristics of only

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TABLE 4

JOB FUNCTION BY JOB FIELD: CROSS-TABULATION OF RESPONDENTS FOR R, D, D, AND E FUNCTIONS
WITHIN VOCATIONAL AND NON-VOCATIONAL FIELDS ONLY

(N = 212)

Field	Research	Development	Diffusion	Evaluation	Total
Voc Ed	51	60	19	25	155
% of N	24.0	28.3	8.9	11.7	73.1
Non Voc Ed	22	17	3	15	57
% of N	10.3	8.0	1.4	7.0	26.8
Total	73	77	22	40	212
% of N	34.4	36.3	10.3	18.8	100

the respondents who classified themselves as either researchers, developers, diffusers, or evaluators from either the vocational or the non-vocational fields were summarized (N=212).

Tables 5 and 6 present the distribution of males and females in the response group (question 9, VAR002). Table 5 shows the data for the three educational fields and all respondents. The Chi-square test indicated a significant (p=.013) relationship between the sex of the respondents and their educational field. It seems quite evident that the majority of respondents in all three fields were males but that vocational educators had a higher proportion of females than the other fields.

Table 6 presents the sex data for only the RDDE job functions within vocational and non-vocational fields. No statistically significant relationship was found between sex and the four job functions. It is interesting to note that for research, development, and evaluation functions there was a heavy male dominance of 3 to 1 for both vocational and non-vocational fields, but that in diffusion work the ratio approached 1 to 1 in both fields.

Tables 7 and 8 show the data on age of respondents (question 10, VAR003). An analysis of variance test of the data in Table 7 indicated no significant differences in mean ages of respondents from the different educational fields. Inspection of the data in Table 8 from RDDE personnel in vocational and non-vocational fields, showed a surprisingly wide range of ages, from 22 to 72 years, with mean ages from 33.8 to 41.7 years, median ages from 31.3 to 43.7, and modal ages from 28.0 to 46.0. But

TABLE 5

SEX DATA FOR ALL RESPONDENTS BY ALL EDUCATIONAL FIELDS

Sex	Voc (n=373)	Non Voc (n=147)	Part Voc Part Non Voc (n=247)	Statistical Probability Values	All* Respondents (N=786)
Male	306 82.0%	134 91.1%	218 88.2%	$x^2 = 8.85$	658 83.7%
Female	63 16.8%	13 8.8%	25 10.1%	$p = .013$	101 12.8%
Missing Data	4 1.0%	-- --	4 1.6%	$df = 2$	27 3.4%

*Includes 19 who did not indicate an educational field.

%'s are of respective column n's.

TABLE 6

SEX BREAKDOWN OF RESPONDENTS FOR R, D, D, AND E FUNCTIONS WITHIN VOCATIONAL AND NON-VOCATIONAL FIELDS ONLY

(N = 212)

	Research		Development		Diffusion		Evaluation		Sub-Total[1]		Total[2]
	M	F	M	F	M	F	M	F	M	F	
Voc	44	7	50	10	12	7	21	4	127 72.1%	28 77.7%	155 73.1%
Non Voc	21	1	16	1	1	2	11	4	49 27.8%	8 22.2%	57 26.8%
Number in Group	65	8	66	11	13	9	32	8	176 n_1	36 n_2	212 N

$x^2 = 9.205$

$p = .242$

$df = 7$

[1] %'s are of n_1 or n_2

[2] %'s are of N

TABLE 7

YEARS OF AGE FOR ALL RESPONDENTS BY ALL EDUCATIONAL FIELDS

Age	Voc (n=373)	Non Voc (n=147)	Part Voc Part Non Voc (n=247)	Statistical Probability Values	All* Respondents (N=786)
Age in Years of Respondents	$\bar{X}$ = 41.76 s = 10.02 n = 356	$\bar{X}$ = 41.78 s = 9.43 n = 142	$\bar{X}$ = 41.63 s = 8.72 n = 242	F = .007 p = > .05	$\bar{X}$ = 41.72 s = 9.50 n = 759
Missing Data	17	5	3		27

*Includes 19 who did not indicate an educational field.

n's indicate number of respondents answering question.

TABLE 8

YEARS OF AGE FOR RESPONDENTS FOR R, D, D, AND E FUNCTIONS
WITHIN VOCATIONAL AND NON-VOCATIONAL FIELDS ONLY

(N = 212)

	Research		Development		Diffusion		Evaluation		Sub-total		Total
	Voc	Non Voc	Voc	Non Voc	Voc	Non Voc	Voc	Non Voc	Voc	Non Voc	
Mean	39.2	41.4	40.1	40.6	37.9	41.6	41.7	33.8	39.7	39.1	39.5
Minimum	22	30	25	24	25	28	25	29	22	24	22
Maximum	72	59	65	52	63	60	61	44	72	60	72
Median	39.4	39.7	37.4	43.7	36.0	40.5	40.5	31.3	38.3	38.8	38.5
Mode	40	35	34	46	30	28	34	29	30	35 to 46	30
Standard Deviation	8.56	8.17	8.27	8.98	10.04	6.50	8.92	6.00	8.85	7.44	8.20
Number in Group	51	22	60	17	19	3	25	25	155	57	212

although a good deal of variability existed within each category, the mean ages of researchers, developers, diffusers, and evaluators appeared to be similar to each other.

Tables 9 and 10 present the data describing degrees held (question 11, VAR004 to VAR011). The question requested the respondent to check all degrees held, but apparently this question was misunderstood and many who checked holding a doctorate did not indicate that they also held a master's or a bachelor's degree. Nevertheless, it is clear that a majority of the respondents held doctorates. Both Tables 9 and 10 reveal that a greater proportion of the non-vocational RDDE personnel held the doctorate degree than did vocational RDDE personnel. On the other hand, there seems to be very little difference in either field in the proportion who held the doctorate and were researchers, developers, diffusers, or evaluators.

With regard to majors for the highest degree held (question 13, VAR023), Table 11 shows that, not unexpectedly, a higher percent of vocational education personnel specialized in vocational education training, while in the non-vocational and part vocational part non-vocational fields, the greatest percent of personnel majored in educational administration and psychology.

For the vocational and non-vocational RDDE personnel only, Table 12 indicates that vocational personnel were trained mainly in vocational education, teaching, and administration, while the non-vocational personnel were trained mainly in psychology, administration, research, and teaching. This general pattern appears

TABLE 9

DEGREES HELD FOR ALL RESPONDENTS BY ALL EDUCATIONAL FIELDS

Degrees Held	Voc (n=373)	Non Voc (n=147)	Part Voc Part Non Voc (n=247)	Statistical Probability Values	All* Respondents (N=786)
Doctorate	201 53.9%	114 77.6%	154 62.3%	No tests performed.	482 61.3%
Specialist	20 5.4%	4 2.7%	16 6.5%	Insuffi-	48 6.1%
Masters	234 62.7%	79 53.7%	136 55.1%	cient	460 58.5%
Bachelors	185 49.6%	72 49.0%	118 47.8%	number of	382 48.6%
Associate	15 4.0%	5 3.4%	10 4.0%	respondents.	31 3.9%
Technical	15 4.0%	2 1.4%	5 2.0%		22 2.8%
Other	12 3.2%	1 .7%	5 2.0%		18 2.3%

*Includes 19 who did not indicate an educational field.

%'s are of respective column n's.

TABLE 10

DEGREES HELD BY RESPONDENTS FOR R, D, D, AND E FUNCTIONS WITHIN VOCATIONAL AND NON-VOCATIONAL FIELDS ONLY

(N = 212)

Degrees	Research		Development		Diffusion		Evaluation		Sub-Total[1]		Total[2]
	Voc	Non Voc	Voc	Non Voc	Voc	Non Voc	Voc	Non Voc	Voc	Non Voc	
Doctorate	28	20	32	11	8	2	12	8	80 51.6%	41 71.9%	121 57.8%
Specialist	4	1	3	1	--	--	--	--	7 4.5%	2 3.5%	9 4.2%
Masters	20	12	40	7	12	2	16	11	88 56.7%	32 56.1%	120 53.7%
Bachelors	23	13	30	8	15	3	14	8	82 52.9%	32 56.1%	114 53.7%
Associate	2	1	1	--	1	--	--	--	4 2.5%	1 1.7%	5 2.3%
Technical License	1	--	3	1	--	--	--	--	4 2.5%	1 1.7%	5 2.3%
Other	1	--	--	1	--	--	--	--	1 .6%	1 1.7%	2 .9%
Number in Group	51	22	60	17	19	3	25	15	155 n_1	57 n_2	212 N

[1] %'s are of n_1 or n_2

[2] %'s are of N

TABLE 11

MAJORS FOR HIGHEST DEGREE FOR ALL RESPONDENTS
BY ALL EDUCATIONAL FIELDS

Major	Voc (n=373)	Non Voc (n=147)	Part Voc Part Non Voc (n=247)	Statistical Probability Values	All* Respondents (N=786)
Education/Teaching	50 13.5%	13 8.9%	18 7.3%	No tests performed.	83 10.6%
Education/Administration	57 15.4%	24 16.4%	49 19.9%	Insufficient number of	135 17.3%
Education/Research	25 6.7%	17 11.6%	23 9.3%	respondents.	66 8.4%
Education/Curriculum	19 5.1%	13 8.9%	16 6.5%		50 6.4%
Guidance/Counseling	22 5.9%	10· 6.8%	20 8.1%		53 6.8%
Vocational Education	102 27.5%	1 .7%	20 8.1%		123 15.7%
Statistics/Measurement/ Tests	3 .8%	12 8.2%	8 3.3%		23 2.9%
Psychology	20 5.4%	25 17.1%	39 15.9%		85 10.9%
Sociology	4 1.1%	3 2.1%	3 1.2%		10 1.3%
Engineering	2 .5%	2 1.4%	8 3.3%		13 1.7%
Computer Sciences	1 .3%	--	--		1 .1%
English/Writing	4 1.1%	1 .7%	4 1.6%		9 1.2%
Humanities	2 .5%	2 1.4%	4 1.6%		8 1.0%
Business Administration	3 .8%	1 .7%	2 .8%		6 .8%
Physical Sciences	3 .8%	--	4 1.6%		7 .9%
Biological Sciences	4 1.1%	1 .7%	--		5 .6%
Industrial Relations	--	--	1 .4%		1 .1%
Other	50 13.5%	21 14.4%	22 8.9%		104 13.3%
Missing Data	2 .5%	1 .6%	1 .4%		4 .5%

*Includes 19 who did not indicate an educational field.

%'s are of respective column n's.

TARLF 12

MAJORS FOR HIGHEST DEGREE OF RESPONDENTS FOR R, D, D, AND E FUNCTIONS WITHIN VOCATIONAL AND NON-VOCATIONAL FIELDS ONLY

(N = 212)

Major	Research Voc	Research Non Voc	Development Voc	Development Non Voc	Diffusion Voc	Diffusion Non Voc	Evaluation Voc	Evaluation Non Voc	Sub-Total[1] Voc	Sub-Total[1] Non Voc	Total[2]
Education/Testing	7	.	10	3	3	1	.	2	20 / 12.9%	6 / 10.5%	26 / 12.2%
Education/Administration	8	4	8	3	1	.	6	1	23 / 14.8%	8 / 14.0%	31 / 14.6%
Education/Research	7	2	2	1	.	.	2	4	11 / 7.1%	7 / 12.2%	18 / 8.4%
Education/Curriculum	.	.	6	2	1	.	.	1	7 / 4.5%	3 / 5.2%	10 / 4.7%
Guidance/Counseling	4	2	6	.	1	.	1	1	12 / 7.7%	3 / 5.2%	15 / 7.0%
Vocational Education	10	2	18	2	6	.	7	.	41 / 26.5%	4 / 7.1%	45 / 21.2%
Statistics/Measurement/Tests	.	2	.	1	.	.	.	1	..	4 / 7.1%	4 / 1.8%
Psychology	5	6	2	3	.	.	2	2	9 / 5.8%	11 / 19.3%	20 / 9.4%
Sociology	2	.	.	.	.	.	1	.	3 / 1.6%	..	3
Engineering	1	.	1	.	1	.	.	.	3 / 1.9%	..	3 / 1.4%
Computer Sciences	.	.	.	.	.	.	.	.	..	..	..
English/Writing	.	.	.	.	.	.	.	1	2 / 1.2%	1 / 1.7%	3 / 1.4%
Humanities	.	.	.	.	1	1	1	1	2 / 1.2%	1 / 1.7%	3 / 1.4%
Business Administration	.	.	.	1	1	.	.	.	1 / .6%	1 / 1.7%	2 / .9%
Physical Sciences	1	.	1	.	.	.	.	.	2 / 1.2%	..	2 / .9%
Biological Sciences	.	.	2	.	.	.	.	.	2 / 1.2%	..	2
Industrial Relations	.	.	.	.	.	.	.	.	..	..	..
Other	6	4	4	1	2	1	5	2	17 / 10.9%	8 / 14.0%	25 / 11.7%
Number in Group	51	22	60	17	19	3	25	13	155 n_1	57 n_2	212 N

1. %'s are of n_1 or n_2
2. %'s are of N

to hold true between RDDE job functions within each field, with the exception that for vocational researchers and non-vocational evaluators a higher proportion than usual were trained in research.

Tables 13 and 14 show the summary of data collected regarding minors for the highest degree held (question 14, VAR024 to VAR041). Table 13 indicates that, for all respondents, the most popular minors for vocational personnel were vocational education, educational administration, teaching, and research. For non-vocational personnel, statistics/measurement, research, and psychology were most popular, while administration, research, and teaching were the most popular minors of part vocational part non-vocational personnel.

Table 14 reveals that among the non-vocational RDDE personnel the largest percent took their minors in subjects not listed in the table (77.1% "other"), with statistics, research, teaching, and psychology following in that order. The most popular minors for vocational RDDE personnel, on the other hand, were research, followed by "other", and then vocational education and administration.

Tables 15 and 16 show the data describing professional organization memberships (question 12, VAR012 to VAR022). Table 15 indicates that for all respondents by educational field a larger number of vocational personnel belonged to the AVA and AVERA than did non-vocational personnel, while more of the latter tended to join AERA and the APA. Membership in the other associations appeared to be fairly evenly spread across all three educational fields.

TABLE 13

MINORS FOR HIGHEST DEGREE FOR ALL RESPONDENTS
BY ALL EDUCATIONAL FIELDS

Minor	Voc (n=373)	Non Voc (n=147)	Part Voc Part Non Voc (n=247)	Statistical Probability - Values	All* Respondents (N=786)
Education/Teaching	69 18.5%	16 10.9%	48 19.4%	No tests performed due to possibility of responses being in more than one Minor category.	137 17.4%
Education/Administration	78 20.9%	14 9.5%	124 50.2%		126 16.0%
Education/Research	69 18.5%	27 18.4%	51 20.6%		150 19.1%
Education/Curriculum	49 13.1%	12 8.2%	38 15.4%		102 13.0%
Guidance/Counseling	34 9.1%	5 3.4%	16 6.5%		56 7.1%
Vocational Education	82 22.0%	2 1.4%	17 6.9%		103 13.1%
Statistics/Measurement Tests	46 12.3%	30 20.4%	41 16.6%		121 15.4%
Psychology	32 8.6%	25 17.0%	35 14.2%		93 11.8%
Sociology	27 7.2%	5 3.4%	13 5.3%		45 5.7%
Engineering	12 3.2%	2 1.4%	10 4.0%		25 3.2%
Computer Sciences	11 2.9%	6 4.1%	6 2.4%		23 2.9%
English/Writing	13 3.5%	6 4.1%	6 2.4%		26 3.3%
Humanities	12 3.2%	1 .7%	11 4.5%		24 3.1%
Business Administration	16 4.3%	6 4.1%	15 6.1%		37 4.7%
Physical Sciences	7 1.9%	2 1.4%	7 2.8%		21 2.7%
Biological Sciences	11 2.9%	6 4.1%	4 1.6%		21 2.7%
Industrial Relations	6 1.6%	--	7 2.8%		14 1.8%
Other	72 19.3%	31 21.1%	46 18.6%		156 19.8%

*Includes 19 who did not indicate an educational field.

%'s are of respective column n's.

TABLE 14

MINORS FOR HIGHEST DEGREE OF RESPONDENTS FOR R, D, D, AND E FUNCTIONS
WITHIN VOCATIONAL AND NON-VOCATIONAL FIELDS ONLY

(N = 212)

Minor	Research Voc	Research Non Voc	Development Voc	Development Non Voc	Diffusion Voc	Diffusion Non Voc	Evaluation Voc	Evaluation Non Voc	Sub-Total[1] Voc	Sub-Total[1] Non Voc	Total[2]
Education/Teaching	4	1	11	5	4	-	3	2	22 14.1%	8 14.0%	30 14.1%
Education/Administration	7	1	7	-	5	-	5	4	24 15.4%	5 8.7%	29 13.6%
Education/Research	10	6	15	1	4	-	4	2	33 21.2%	9 15.7%	42 19.8%
Education/Curriculum	5	2	7	3	2	-	5	-	19 12.2%	5 8.7%	24 11.3%
Guidance/Counseling	11	1	4	-	-	-	1	1	15 9.6%	2 3.5%	17 8.0%
Vocational Education	5	-	10	-	1	-	8	-	24 15.4%	--	24 11.3%
Statistics/Measurement Tests	8	5	7	2	2	-	6	3	23 14.8%	10 17.5%	33 15.5%
Psychology	4	2	8	2	1	1	-	3	13 8.3%	8 14.0%	21 9.9%
Sociology	5	-	2	-	3	-	1	-	11 7.1%	--	11 5.1%
Engineering	1	1	2	-	1	1	1	-	5 3.2%	2 3.5%	7 3.3%
Computer Sciences	1	2	-	1	1	.-	2	-	4 2.5%	3 5.2%	7 3.3%
English/Writing	3	-	1	3	-	-	-	-	4 2.5%	3 5.2%	7 3.3%
Humanities	1	-	1	-	1	-	2	-	5 3.2%	--	5 2.3%
Business Administration	2	1	2	1	1	-	2	-	7 4.5%	2 3.5%	9 4.2%
Physical Sciences	1	-	-	-	-	-	-	-	1 .6%	--	1 .4%
Biological Sciences	4	-	-	-	1	-	-	-	5 3.2%	--	5 2.3%
Industrial Relations	2	-	-	-	-	-	-	-	2 1.2%	--	2 .9%
Other	11	5	8	6	4	1	4	5	27 17.4%	44 77.1%	71 33.4%
Number in Group	51	22	60	17	19	3	25	15	155 n_1	57 n_2	212 N

1. %'s are of n_1 or n_2

2. %'s are of N

TABLE 15

PROFESSIONAL ORGANIZATION MEMBERSHIPS FOR
ALL RESPONDENTS BY ALL EDUCATIONAL FIELDS

Organization	Voc (n=373)	Non Voc (n=147)	Part Voc Part Non Voc (n=247)	Statistical Probability Values	All* Respondents (N=786)
AERA	124 33.2%	80 54.4%	90 36.4%	No tests performed due to possibility of responses being in more than one Association category.	298 37.9%
NEA	65 17.4%	31 21.1%	55 22.3%		156 19.8%
AVA	289 77.5%	11 7.5%	82 33.2%		388 49.4%
APGA	22 5.9%	14 9.5%	22 8.9%		59 7.5%
APA	16 4.3%	37 25.2%	45 18.2%		99 12.6%
AECT	8 2.1%	6 4.1%	10 4.0%		24 3.1%
AIAA	37 9.9%	5 3.4%	19 7.7%		62 7.9%
AVERA	147 39.4%	4 2.7%	47 19.0%		200 25.4%
PDK	173 46.4%	60 40.8%	109 44.1%		339 43.1%
Others	282 75.6%	146 99.3%	185 74.9%		632 80.4%

*Includes 19 who did not indicate an educetional field.

%'s are of respective column n's.

TABLE 16

PROFESSIONAL ORGANIZATION MEMBERSHIPS OF RESPONDENTS FOR R, D, D, AND E FUNCTIONS WITHIN VOCATIONAL AND NON-VOCATIONAL FIELDS ONLY

(N = 212)

Association	Research Voc	Research Non Voc	Development Voc	Development Non Voc	Diffusion Voc	Diffusion Non Voc	Evaluation Voc	Evaluation Non Voc	Sub-Total[1] Voc	Sub-Total[1] Non Voc	Total[2]
AERA	19	16	18	8	7	1	5	1	49 31.6%	26 45.6%	75 35.3%
NEA	4	2	13	5	-	2	4	3	21 13.5%	11 19.3%	32 15.0%
AVA	37	-	45	1	11	-	20	-	113 72.9%	1 1.7%	114 53.7%
APGA	6	10	3	2	-	-	-	2	9 5.8%	12 21.0%	21 9.9%
APA	3	10	3	2	-	1	-	-	6 3.8%	12 21.0%	18 8.4%
AECT	1	1	2	-	-	1	1	1	4 2.5%	3 5.2%	7 3.3%
AIAA	2	1	10	1	1	-	3	-	16 10.3%	2 3.5%	18 8.4%
AVERA	19	1	18	1	6	-	10	-	53 34.1%	2 3.5%	55 25.9%
PDK	20	7	31	8	8	-	11	4	70 45.1%	19 33.3%	89 41.9%
Other	44	23	38	16	9	2	10	11	101 65.1%	52 91.2%	153 72.1%
Number in Group	51	22	60	17	19	3	25	15	155 n_1	57 n_2	212 N

1. %'s are of n_1 or n_2

2. %'s are of N

Under the "other" association a total of 210 organizations were listed, ranging from what appeared to be fraternities to Asian and African student organizations.

Table 16 presents the data concerning only vocational and non-vocational RDDE personnel. Here too, between the vocational and non-vocational groups, proportionally more vocational personnel held memberships in organizations directly oriented toward vocational education (AVA, AVERA, AIAA), while proportionally more non-vocational personnel held memberships in organizations directly oriented toward non-vocational education (APGA, APA). The associations covering the more general aspects of the total field of education (AERA, NEA, PDK) were indicated as associations to which proportionally more equal numbers of vocational and non-vocational personnel belonged. Except that a large proportion of vocational developers belonged to the NEA than might be expected, there seemed to be no other differences between vocational researchers, developers, diffusers, and evaluators in terms of the professional associations to which they belong.

Tables 17 and 18 present the data describing years of experience in work areas (question 15, VAR042 to VAR048). Table 17 shows that for all respondents by educational field, with the exception of previous work experience in RDDE activities, the persons in all three educational fields showed similar mean number of years in the remaining work areas. In the RDDE work area vocational personnel had significantly fewer mean years of experience than non-vocational personnel and part vocational part non-vocational

TABLE 17

YEARS OF EXPERIENCE IN WORK AREAS FOR
ALL RESPONDENTS BY ALL EDUCATIONAL FIELDS

Work Area	Voc (N=373)	Non Voc (N=167)	Part Voc Part Non Voc (N=247)	Statistical Probability Values	All* Respondents (N=786)
Administration	X̄ = 7.00 s = 6.25 n = 215	X̄ = 7.05 s = 5.31 n = 94	X̄ = 7.79 s = 6.54 n = 155	F = .018 p > .05	X̄ = 7.32 s = 6.25 n = 477
Teaching	X̄ = 10.24 s = 8.09 n = 337	X̄ = 10.81 s = 8.56 n = 126	X̄ = 9.15 s = 7.41 n = 221	F = 2.277 p > .05	X̄ = 10.01 s = 7.96 n = 698
Conducting RDD&E Activities	X̄ = 4.82 s = 3.81 n = 220	X̄ = 6.89 s = 5.74 n = 107	X̄ = 6.88 s = 5.69 n = 163	F = 10.513 p < .01	X̄ = 6.01 s = 5.15 n = 502
Consultation	X̄ = 5.21 s = 4.07 n = 92	X̄ = 7.30 s = 6.46 n = 50	X̄ = 6.75 s = 6.41 n = 74	F = 2.790 p > .05	X̄ = 6.12 s = 5.77 n = 223
Other Educational Employment	X̄ = 5.75 s = 7.43 n = 66	X̄ = 5.72 s = 4.89 n = 18	X̄ = 4.42 s = 3.56 n = 42	F = .711 p > .05	X̄ = 5.50 s = 6.23 n = 127
Other Non-professional Education Employment	X̄ = 6.40 s = 6.07 n = 90	X̄ = 6.87 s = 6.71 n = 23	X̄ = 6.71 s = 6.18 n = 59	F = .072 p > .05	X̄ = 6.80 s = 6.66 n = 177
Present Position	X̄ = 4.17 s = 4.73 n = 334	X̄ = 5.20 s = 5.04 n = 134	X̄ = 4.59 s = 4.66 n = 231	F = 1.318 p > .05	X̄ = 4.52 s = 4.79 n = 713

*Includes 19 who did not indicate an educational field.

n's indicate number of respondents answering question.

TABLE 18

AVERAGE NUMBER OF YEARS SPENT IN WORK AREAS FOR RESPONDENTS FOR R, D, D, AND E FUNCTIONS WITHIN VOCATIONAL AND NON-VOCATIONAL FIELDS ONLY

(N = 212)

Work Area	Research Voc	Research Non Voc	Development Voc	Development Non Voc	Diffusion Voc	Diffusion Non Voc	Evaluation Voc	Evaluation Non Voc	Sub-Total Voc	Sub-Total Non Voc	Total
Administration	8.3	7.6	9.3	8.3	6.1	10.0	7.4	1.6	8.2	6.3	7.6
Teaching	10.6	11.6	9.7	7.5	7.3	14.0	7.1	5.6	9.2	8.9	9.1
Conducting RDDE Activities	5.5	7.8	4.3	4.3	5.4	5.0	4.1	4.0	4.7	5.6	4.9
Consultation	3.7	6.8	4.5	8.0	4.4	--	7.2	2.0	4.6	5.5	4.8
Other Educational Employment	16.5	20.0	5.6	5.5	3.5	10.0	4.7	6.0	8.7	11.4	9.4
Other Employment (Non-professional)	5.5	4.5	6.5	12.3	1.7	5.0	5.4	--	5.4	5.9	5.5
Present Position	3.7	3.9	3.3	4.0	2.0	10.0	3.5	3.6	3.3	4.1	3.9
Number in Group	51	22	60	17	19	3	25	15	155	57	212

personnel. Apparently RDDE activities in the non-vocational field have been going on for a longer period of time than such activities in vocational education.

No glaring differences in average number of years spent in previous work areas were revealed in Table 18 between vocational and non-vocational personnel. It is interesting to note that researchers have spent more time in "other educational employment" than persons in the other three job functions. Other interesting differences in mean number of years experience were indicated between vocational and non-vocational developers for "other non-professional employment"; between vocational and non-vocational diffusers for "administration", "teaching", "other educational employment", and "present position" work experience (although these differences may be strongly influenced by the small number of non-vocational diffusers); and between vocational and non-vocational evaluators for "administration" work experience.

Tables 19 and 20 provide a summary of the data concerning the respondents' agreement with the definitions provided by the study (question 25, VAR269 to VAR274). Table 19 shows that for all respondents by educational field there were, between the three fields, statistically significant differences in the mean agreement with the definitions for research, development, and diffusion, but similar mean agreement ratings for all other definitions. Vocational educators showed a significantly lower mean agreement rating for the definitions of development and diffusion than the other two fields, while non-vocational educators had a lower mean

TABLE 19

AGREEMENT WITH DEFINITIONS FOR ALL RESPONDENTS
BY ALL EDUCATIONAL FIELDS**

Definitions	Voc (n=373)	Non Voc (n=147)	Part Voc Part Non Voc (n=247)	Statistical Probability Values	All* Respondents (N=786)
RDDE	$\overline{X}$ = 3.90 s = 1.876 n = 347	$\overline{X}$ = 3.90 s = 1.921 n = 133	$\overline{X}$ = 3.80 s = 1.920 n = 225	F = 1.41 p = >.05	$\overline{X}$ = 3.86 s = .75 n = 723
Research	$\overline{X}$ = 4.08 s = 1.955 n = 346	$\overline{X}$ = 2.58 s = 2.025 s = 134	$\overline{X}$ = 4.03 s = 1.994 n = 230	F = 49.52 p = <.01	$\overline{X}$ = 4.05 s = .76 s = 728
Development	$\overline{X}$ = 2.96 s = 1.927 n = 348	$\overline{X}$ = 3.91 s = 1.955 n = 134	$\overline{X}$ = 3.69 s = 1.963 n = 229	F = 35.08 p = <.01	$\overline{X}$ = 3.94 s = .80 n = 729
Diffusion	$\overline{X}$ = 2.97 s = 1.884 n = 348	$\overline{X}$ = 3.90 s = 1.991 n = 133	$\overline{X}$ = 3.82 s = 1.935 n = 228	F = 18.7 p = < .01	$\overline{X}$ = 3.83 s = .83 n = 726
Evaluation	$\overline{X}$ = 4.07 s = 1.975 s = 347	$\overline{X}$ = 3.98 s = 1.990 s = 134	$\overline{X}$ = 4.01 s = 1.993 s = 229	F = .886 p = > .05	$\overline{X}$ = 4.01 s = .82 s = 728
Vocational Education	$\overline{X}$ = 3.93 s = 1.968 n = 347	$\overline{X}$ = 3.71 s = 1.899 s = 132	$\overline{X}$ = 3.71 s = 1.948 n = 229	F = 4.13 p = > .05	$\overline{X}$ = 3.81 s = .99 n = 726
Manpower	$\overline{X}$ = 3.93 s = 1.957 s = 341	$\overline{X}$ = 3.87 s = 1.927 s = 134	$\overline{X}$ = 3.96 s = 1.953 n = 229	F = .595 p = > .05	$\overline{X}$ = 3.93 s = .82 n = 723

*Includes 19 who did not indicate an educational field.

**Scale to represent agreement with definitions:

       5 Agree Strongly
       4 Agree
       3 Undecided
       2 Disagree
       1 Disagree Strongly

n's indicate number of respondents answering question.

TABLE 20

AVERAGE AGREEMENT WITH DEFINITIONS BY RESPONDENTS FOR R, D, D, AND E FUNCTIONS WITHIN VOCATIONAL AND NON-VOCATIONAL FIELDS ONLY

(N = 212)

Definitions for	Research		Development		Diffusion		Evaluation		Sub-Total		Total
	Voc	Non Voc	Voc	Non Voc	Voc	Non Voc	Voc	Non Voc	Voc	Non Voc	
RDDE	3.8	3.9	4.1	4.0	4.0	4.0	3.8	3.9	3.9	3.9	3.9
Research	4.1	4.0	4.1	4.3	4.0	4.0	3.9	4.0	4.0	4.0	4.0
Development	4.0	3.8	4.1	4.1	4.1	4.0	4.0	4.0	4.0	3.9	3.9
Diffusion	3.9	4.0	4.1	4.2	3.8	4.0	3.9	3.0	3.9	4.0	3.9
Evaluation	4.1	3.9	4.1	4.2	3.7	4.0	4.0	4.0	4.0	4.0	4.0
Vocational Education	3.9	3.5	3.9	3.5	3.5	3.0	3.9	3.9	3.8	3.5	3.7
Manpower	3.8	3.7	4.1	4.0	3.6	3.6	3.9	3.7	3.9	3.7	3.8
Number in Group	51	22	60	17	19	3	25	15	155	57	212

Scale to represent agreement with definitions:

   5   Agree Strongly
   4   Agree
   3   Undecided
   2   Disagree
   1   Disagree Strongly

agreement rating for the definition of research than did the other
two fields.

Table 20 indicates that between RDDE job function groups
and between vocational and non-vocational educational fields there
was a reasonably high degree of agreement with the definitions of
the terms and with each other. This group, whose members considered
themselves either researchers, developers, diffusers, or evalua-
tors, had a higher degree of common understanding about the
definitions of these functions than did respondents who performed
other or joint functions.

This section has reported the data collected describing
the respondents in terms of the general (personal) characteristics
of sex, age, degrees held, majors, minors, association member-
ships, previous work experience, and agreement with definitions
about educational RDDE. The data were shown for all respondents,
with specific breakdown between educational fields, and for just
those respondents who performed R, D, D, and E functions within
vocational and non-vocational fields only.

The next section presents data describing the in-service
training needs of the survey respondents.

IN-SERVICE TRAINING

The same two general types of analyses were performed
with in-service training data as were performed with general
(personal) characteristics data. That is, first the three educa-
tional fields (vocational, non-vocational, and part vocational

part non-vocational) were compared after collapsing all job func-
tions (N=786). Second, the data from only the respondents who
classified themselves as either vocational or non-vocational
researchers, developers, diffusers, or evaluators were summarized
(N=212).

Table 21 presents the data about recent in-service parti-
cipation (question 24, VAR268) for all respondents (N=786), while
Table 23 presents the data about their present expressed in-
service training needs (question 23, VAR257 to VAR267). Table 21
shows that there was no signficant relationship between educational
field and whether or not the respondent had participated the past-
year in in-service training. In Table 23, it is interesting to
note that a fairly large percent of the combined respondents ex-
pressed a current need for all kinds of in-service training, but
that non-vocational personnel appeared to have less of a need for
almost all areas of training than did the vocational group.

Tables 22 and 24 present the in-service training data for
the vocational and non-vocational RDDE personnel only. Table 22
shows that between vocational and non-vocational groups similar
proportions of persons participated in past-year in-service
training. When educational fields were collapsed a statistically
significant relationship (as measured by the Chi-square test of
independence) was found between the yes or no answer to the
participation in in-service training variable and the job func-
tions classification variable. A high proportion of evaluators

TABLE 21

PARTICIPATION IN PAST-YEAR IN-SERVICE TRAINING
FOR ALL RESPONDENTS BY ALL EDUCATIONAL FIELDS

Response	Voc (n=373)	Non Voc (n=147)	Part Voc Part Non Voc (n=247)	Statistical Probability Values	All* Respondents (N=786)
Yes	203 54.4%	69 46.9%	128 51.8%	$\chi^2 = 2.186$	413 52.5%
No	155 41.5%	70 47.6%	112 45.3%	P = .34	343 43.8%
Missing Data	15 4.0%	8 5.4%	7 2.8%	df = 2	30 1.8%

*Includes 19 who did not indicate an educational field.

%'s are of respective column n's.

TABLE 22

PARTICIPATION IN PAST-YEAR IN-SERVICE TRAINING BY RESPONDENTS FOR R, D, D, AND E FUNCTIONS WITHIN VOCATIONAL AND NON-VOCATIONAL FIELDS ONLY

(N = 212)

	Research		Development		Diffusion		Evaluation		Sub-Total[1]		Total[2]
	Voc	Non Voc	Voc	Non Voc	Voc	Non Voc	Voc	Non Voc	Voc	Non Voc	
Yes	25	7	29	9	9	1	14	11	77 49.6%	28 49.1%	105 49.5%
No	25	13	29	8	9	2	2	1	65 41.9%	24 42.1%	89 41.9%
Missing Data	1	2	2	-	1	-	9	3	13 8.3%	5 8.7%	18 8.4%
Number in Group	51	22	60	17	19	3	25	15	155 n_1	57 n_2	212 N

$X^2 = 98.09$

$p < .001$

$df = 3$

1. Z's are of n_1 or n_2
2. Z's .:e of N

TABLE 23

IN-SERVICE TRAINING NEEDS FOR ALL RESPONDENTS
BY ALL EDUCATIONAL FIELDS

Training Area	Voc (n=373)	Non Voc (n=167)	Part Voc Part Non Voc (n=247)	Statistical Probability Values	All* Respondents (N=785)
Statistics	153 41.0%	59 39.4%	111 66.2%	No tests performed due to possibility of responses being in more than one In-service Need category.	327 41.6%
Research Design	158 42.4%	42 11.3%	106 28.6%		314 39.9%
Survey Methodology	109 29.2%	31 8.3%	81 21.7%		222 28.2%
Measurement/Testing	137 36.7%	40 10.7%	92 24.7%		276 35.1%
Writing Techniques	123 33.0%	34 9.1%	65 17.4%		230 29.3%
Teaching/Training Techniques	95 25.5%	19 5.1%	59 15.8%		174 22.1%
Administration	110 29.5%	39 10.5%	68 18.2%		223 28.4%
Program Planning Budgeting	142 38.1%	53 34.2%	95 25.5%		297 37.8%
Computers/Programming	167 39.4%	57 35.3%	107 28.7%		319 40.6%
Other	25 6.7%	18 4.8%	25 6.7%		69 8.8%

*Includes 19 who did not indicate an educational field.

%'s are of respective column n's.

TABLE 24

IN-SERVICE TRAINING NEEDS OF RESPONDENTS FOR R, D, D, AND E FUNCTIONS
WITHIN VOCATIONAL AND NON-VOCATIONAL FIELDS ONLY

(N = 212)

Training Area	Research		Development		Diffusion		Evaluation		Sub-Total[1]		Total[2]
	Voc	Non Voc	Voc	Non Voc	Voc	Non Voc	Voc	Non Voc	Voc	Non Voc	
Characteries	29	7	23	10	4	--	7	4	61 40.6%	21 36.8%	84 39.6%
Research Design	34	6	17	6	5	1	8	6	64 41.7%	19 33.3%	83 39.1%
Survey Methodology	25	4	10	4	4	--	7	3	46 29.6%	21 19.3%	57 26.8%
Measurement/ Testing	20	5	24	8	5	--	6	5	55 35.4%	18 31.5%	73 34.4%
Teaching/ Training Techniques	15	1	16	3	3	--	3	3	37 23.8%	7 12.2%	44 20.7%
Administration	19	4	15	4	6	2	9	4	49 31.6%	14 24.5%	63 29.7%
Program Planning Budgeting	21	5	18	3	3	--	11	11	53 34.1%	19 33.3%	72 33.9%
Computers/ Programming	25	10	20	6	2	--	12	5	59 38.0%	21 36.8%	80 17.9%
Writing Techniques	17	3	24	7	8	1	12	4	61 39.3%	15 26.3%	76 35.8%
Other	4	1	5	--	2	--	1	2	12 7.7%	3 5.2%	15 7.0%
Number in Group	51	22	60	17	19	3	25	15	155 n_1	57 n_2	212 N

1. %'s are of n_1 or n_2
2. %'s are of N

took in-service training while much lower proportions of re-searchers, developers, and diffusers took training.

Table 24 indicates that a fairly high percent of both the vocational and the non-vocational RDDE respondents specified all training areas as perceived in-service training needs. As in Table 23 for all respondents, the teaching/training techniques in-service area was the least in demand. Between vocational and non-vocational and R, D, D, and E respondents there were no striking differences noted in the proportions of each expressing an in-service training need.

JOB DESCRIPTIONS

The following section provides a description of the char-acteristics of the jobs performed by survey respondents. The data for the general descriptive information about location of employ-ment, percent time spent on various job activities, and job products-services produced is, again, presented by two types of tables. The first presents data for all survey respondents (N=786), while the second presents data for R, D, D, and E functions within the vocational and non-vocational fields only (N=212).

In terms of place of work (question 19, VAR058), Tables 25 and 26 show the employment location of the respondents. In Table 25 the largest percent of all respondents (37.3%) were employed by Universities, while smaller proportions were in State Education Departments (14.5%), R & D Centers (11.0%), and K-12 School

TABLE 25

PLACE OF WORK FOR ALL RESPONDENTS
BY ALL EDUCATIONAL FIELDS

Place	Voc (n=373)	Non Voc (n=147)	Part Voc Part Non Voc (n=247)	Statistical Probability Values	All* Respondents (N=786)
University or College	134 36.0%	68 46.3%	85 34.4%	No tests performed.	293 37.3%
Junior or Community College	14 3.8%	3 2.0%	13 5.3%	Insufficient number of respondents.	30 3.8%
Technical Inctitute	22 5.9%	--	1 .4%		23 2.9%
R & D Center	49 13.2%	14 9.5%	23 9.3%		86 11.0%
Independent Research Agency	9 2.4%	13 8.8%	25 10.1%		49 6.2%
State Education Department	55 14.8%	21 14.3%	37 15.6%		114 14.5%
Pegional Lab	3 .8%	3 2.0%	2 .8%		9 1.1%
School District (K-12)	26 7.0%	14 9.5%	28 11.3%		73 9.3%
Research Coordinating Unit	30 8.1%	--	2 .8%		32 4.1%
Federal Agency	10 2.7%	--	4 1.6%		15 1.9%
Industry	--	--	2 .8%		3 .4%
Professional Education Association	2 .5%	3 2.0%	1 .4%		6 .8%
Other	18 4.8%	8 5.4%	24 9.7%		52 6.6%
Missing Data	1 .2%	--	--		1 .1%

*Includes 19 who did not indicate en educational field.

%'s are of respective column n's.

TABLE 26

PLACE OF WORK FOR RESPONDENTS FOR R, D, D, AND E FUNCTIONS
WITHIN VOCATIONAL AND NON-VOCATIONAL FIELDS ONLY

(N = 212)

Place	Research		Development		Diffusion		Evaluation		Sub-Total[1]		Total[2]
	Voc	Non Voc	Voc	Non Voc	Voc	Non Voc	Voc	Non Voc	Voc	Non Voc	
University or College	16	14	22	3	6	1	7	0	51 32.9%	18 31.5%	69 32.5%
Junior or Community College	1	-	2	-	-	-	-	1	3 1.9%	1 1.7%	4 1.8%
Technical Institute	2	-	3	-	1	-	3	-	9 5.8%	- -	9 4.2%
R & D Center	10	2	10	2	4	-	3	3	27 17.4%	7 12.2%	34 16.0%
Independent Research Agency	4	2	-	2	-	1	-	1	4 2.5%	6 2.5%	10 4.7%
State Department of Education	6	2	8	3	1	-	8	6	23 16.8%	11 19.7%	34 16.0%
Regional Lab	-	-	2	2	1	-	-	-	3 1.9%	2 2.5%	5 2.3%
K-12 School District	3	-	5	2	2	-	-	3	10 6.4%	5 8.7%	15 7.0%
Research Coordinating Unit	6	-	5	-	2	-	1	-	14 9.0%	- -	14 6.6%
Federal Agency	1	-	2	-	-	-	1	-	4 2.5%	- -	4 1.9%
Industry	-	-	-	-	-	-	-	-	- -	- -	- -
Professional Education Association	-	-	-	-	2	1	-	-	2 1.2%	1 1.7%	3 1.4%
Other	2	2	1	3	-	0	2	1	5 3.2%	6 10.5%	11 5.1%
Number in Group	51	22	60	17	19	3	25	15	155 n_1	57 n_2	212 N

1. X's are of n_1 or n_2

2. X's are of N

78

Districts (9.3%). This pattern was not unlike the pattern for
vocational and non-vocational fields.

Inspection of the data in Table 26 indicates that, whereas
a proportionally greater number of vocational than non-vocational
education personnel were located at technical institutes, R & D
centers, RCUs, and federal agencies, the non-vocational respon-
dents were mainly occupying positions at independent research
agencies, and state departments.

Between job functions for both vocational and non-vocational
personnel, Table 26 reveals that researche·s and developers were
located mainly in universities, R & D centers, RCUs, and state
departments of education. In addition, a sizeable proportion of
developers were located in K-12 school districts. Diffusers were
mainly located in universities, R & D centers, and professional
education associations, but evaluators were located mainly in
state education agencies.

Tables 27 and 28 show the data about percent time spent on
listed current activities (question 18, VAR051 to VAR057). Table
27 shows the data for all respondents by educational field. No
statistically significant differences (as measured by the analysis
of variance) were found between the educational fields in terms
of the mean scale ratings of percent time spent on job activities.
The respondents from the three categories of educational field
were spending approximately the same amount of time in each
activity area. The ranking of activities in terms of decreasing
mean percent time spent on them by all respondents was as follows:

TABLE 27

PERCENTAGE TIME SPENT IN PRESENT JOB ACTIVITIES
BY ALL RESPONDENTS FOR ALL EDUCATIONAL FIELDS[**]

Job Activity	Voc (n=373)	Non Voc (n=147)	Part Voc Part Non Voc (n=247)	Statistical Probability Values	All[*] Respondents (N=786)
Research	$\bar{X}$ = 2.04 s = 2.44 n = 373	$\bar{X}$ = 2.10 s = 2.01 n = 147	$\bar{X}$ = 1.96 s = 1.98 n = 247	F = .228 p = > .05	$\bar{X}$ = 1.99 s = 2.16 n = 786
Development	$\bar{X}$ = 2.22 s = 2.41 n = 373	$\bar{X}$ = 1.98 s = 4.44 n = 147	$\bar{X}$ = 1.81 s = 2.04 n = 247	F = 1.971 p = > .05	$\bar{X}$ = 1.97 s = 2.94 n = 786
Diffusion	$\bar{X}$ = 0.92 s = 1.48 n = 373	$\bar{X}$ = 0.66 s = 1.10 n = 147	$\bar{X}$ = 0.97 s = 1.48 n = 247	F = 1.659 p = > .05	$\bar{X}$ = .88 s = 1.55 n = 786
Evaluation	$\bar{X}$ = 1.32 s = 2.27 n = 373	$\bar{X}$ = 1.67 s = 2.33 n = 147	$\bar{X}$ = 1.54 s = 1.67 n = 247	F = 3.599 p = > .05	$\bar{X}$ = 1.42 s = 2.24 n = 786
Teaching/Training	$\bar{X}$ = 1.46 s = 2.20 n = 373	$\bar{X}$ = 1.72 s = 2.11 n = 147	$\bar{X}$ = 1.44 s = 2.02 n = 247	F = .933 p = > .05	$\bar{X}$ = 1.49 s = 2.10 n = 786
Administration/ Management	$\bar{X}$ = 2.30 s = 2.55 n = 373	$\bar{X}$ = 2.24 s = 2.54 n = 147	$\bar{X}$ = 2.50 s = 2.50 n = 247	F = .646 p = > .05	$\bar{X}$ = 2.35 s = 2.39 n = 786
Other	$\bar{X}$ = 0.48 s = 1.23 n = 373	$\bar{X}$ = 0.37 s = 0.78 n = 147	$\bar{X}$ = 0.61 s = 1.40 n = 247	F = 1.836 p = > .05	$\bar{X}$ = .51 s = 1.76 n = 786

[*] Includes 19 who did not indicate an educational field.

[**] $\bar{X}$'s represent the average of the scale ratings which are translated into percent time according to the following scale:

0 = 0 percent time	6 = 51-60 percent time
1 = 1-10 percent time	7 = 61-70 percent time
2 = 11-20 percent time	8 = 71-80 percent time
3 = 21-30 percent ti e	9 = 81-90 percent time
4 - 31-40 percent time	10 = 91-100 percent time
5 = 41-50 percent time	

n's indicate the number of respondents who answered the question.

TABLE 28

MEAN PERCENT TIME* SPENT ON JOB ACTIVITIES BY RESPONDENTS FOR
R, D, D, AND E FUNCTIONS WITHIN VOCATIONAL AND NON-VOCATIONAL FIELDS ONLY

(N = 212)

Job Activity	Research		Development		Diffusion		Evaluation		Sub-Total		Total
	Voc	Non Voc	Voc	Non Voc	Voc	Non Voc	Voc	Non Voc	Voc	Non Voc	
Research	6.1	5.4	1.5	1.6	1.6	3.0	1.7	1.6	3.0	3.1	3.0
Development	2.0	2.6	5.4	4.9	2.0	3.0	1.8	1.6	3.2	3.0	3.1
Diffusion	1.2	1.8	1.4	1.3	5.1	4.3	1.3	1.0	1.7	1.5	1.6
Evaluation	1.5	2.0	1.7	1.5	1.2	1.0	6.7	6.8	2.3	3.0	2.4
Teaching/ Training	2.5	2.4	1.7	1.2	1.8	-	1.6	1.2	2.1	1.6	1.9
Administration/ Management	2.2	3.5	2.1	2.2	2.2	2.5	3.2	2.0	2.3	2.6	2.3
Other	2.2	3.0	1.2	1.0	2.0	1.5	1.2	1.0	1.6	1.7	1.6
Number in Group	51	22	60	17	19	3	25	15	155	57	212

*Mean represents the average of the scale ratings which are translated into percent
time according to the following scale.

0 = 0 percent time	6 = 51-60 percent time
1 = 1-10 percent time	7 = 61-70 percent time
2 = 11-20 percent time	8 = 71-80 percent time
3 = 21-30 percent time	9 = 81-90 percent time
4 = 31-40 percent time	10 = 91-100 percent time
5 = 41-50 percent time	

administration/management; teaching/training; development; re-
search; evaluation; diffusion; and other. The highest average
time spent was 21% to 30% on Administration/Management activities.
The most often indicated (modal) percent time spent on each of
the activities was 1% to 10% time. Twenty-nine types of dif-
ferent activities were listed by respondents under "other".

Table 28 shows predictable results indicating that
researchers spent most of their time doing research work, devel-
opers doing development work, etc. The job activity categories
defined the job function title or vice-versa. It is equally
apparent, however, that job activities were more varied than job
function titles indicated; researchers, for example, tended to
spend time in other research-related activities as well as in non-
research related activities. Vocational personnel did not differ
from non-vocational personnel in this regard.

Table 29 and 30 present the data describing job products
and services rendered (question 22, VAR240 to VAR256). Table 29
indicates that for all of the respondents by educational field,
the most frequently (50% or more indicating a job outcome) pro-
duced products and services were reports (85.2%), consultation
(73.2%), workshops/conferences (70.2%), proposals (67.5%), and
proposal writing/reviewing (63.9%). The least frequently produced
products and services were books (19.2%), newletters (30.5%), and
tests (32.8%).

Table 30 reveals that vocational and non-vocational RDDE
personnel had similar major products and services (e.g., reports,

TABLE 29

JOB PRODUCTS AND SERVICES FOR ALL
RESPONDENTS BY ALL EDUCATIONAL FIELDS

Products-Services	Voc (n=373)	Non Voc (n=147)	Part Voc Part Non Voc (n=247)	Statistical Probability Values	All* Respondents (N=786)
Newsletters	116 31.1%	34 23.1%	83 33.6%	No tests performed due to possibility of responses being in more than one Product-Service category.	240 30.5%
Reports	313 83.9%	125 85.0%	214 86.6%		670 85.2%
Bibliographies	131 35.1%	58 39.5%	88 35.6%		386 48.7%
Books	59 15.8%	36 24.5%	53 21.5%		151 19.2%
Curriculum Materials	198 53.1%	51 34.7%	109 44.1%		365 46.4%
Methodologies	165 44.2%	76 51.7%	124 50.2%		371 47.2%
Tests	115 30.8%	58 39.5%	80 32.4%		258 32.8%
Proposals	237 63.5%	95 64.6%	185 74.9%		531 67.5%
Training Packages	145 38.9%	51 34.7%	107 43.3%		312 39.6%
Consultation	260 69.7%	107 72.8%	194 78.5%		576 73.2%
Survey/Design Conducting	141 37.8%	55 37.4%	103 41.7%		307 39.0%
Proposal Review/ Writing	227 60.9%	92 62.6%	172 69.6%		503 63.9%
Workshops/Conferences	256 68.6%	88 59.9%	195 78.9%		552 70.2%
Other	40 10.7%	21 14.3%	41 16.6%		105 13.3%

*Includes 19 who did not indicate an educational field.

%'s are of respective column n's.

TABLE 30

JOB PRODUCTS AND SERVICES OF RESPONDENTS FOR R, D, D, AND E FUNCTIONS
WITHIN VOCATIONAL AND NON-VOCATIONAL FIELDS ONLY

(N = 212)

Products-Services	Research Voc	Research Non Voc	Development Voc	Development Non Voc	Diffusion Voc	Diffusion Non Voc	Evaluation Voc	Evaluation Non Voc	Sub-Total[1] Voc	Sub-Total[1] Non Voc	Total[2]
Newsletters	14	3	17	5	11	1	6	2	48 30.9%	11 19.3%	59 27.8%
Reports	43	16	50	14	13	3	23	15	129 83.2%	48 84.2%	177 83.4%
Bibliographies	13	8	17	9	13	2	4	6	47 30.3%	25 43.8%	72 33.9%
Books	7	4	8	3	4	1	2	3	21 13.5%	11 19.3%	32 15.0%
Curriculum Materials	25	4	14	9	5	-	8	3	52 33.5%	16 28.0%	68 32.0%
Methodologies	24	13	29	9	4	1	11	8	6- 43	31 54.3%	99 46.7%
Tests	16	8	21	0	-	-	7	7	28.3%	15 26.3%	59 27.8%
Proposals	35	14	33	7	8	2	12	6	88 56.7%	29 50.8%	117 55.1%
Training Packages	21	7	26	7	1	1	4	7	52 33.5%	22 38.6%	74 34.9%
Consultation	36	14	42	9	12	2	17	9	107 69.0%	34 59.6%	141 66.5%
Survey Design/ Conducting	23	8	18	4	3	1	15	8	59 38.0%	21 36.8%	80 37.7%
Proposal Review/ Writing	29	12	34	8	9	3	15	9	87 56.1%	32 57.8%	119 56.1%
Workshops/ Conferences	30	11	41	10	11	2	10	10	92 59.3%	33 57.8%	125 58.9%
Other	3	-	8	3	2	1	1	2	14 9.0%	6 10.5%	20 9.4%
Number in Group	51	22	60	17	19	3	25	15	155 n_1	57 n_2	212 N

1. %'s are of n_1 or n_2

2. %'s are of N

consultation, workshops), but that they differed in the less impor-

tant products and services; proportionally more vocational edu-

cators tended to produce newsletters, while proportionally more

non-vocational personnel turned out tests, bibliographies, and

methodologies.

Within the vocational personnel, researchers, developers,

diffusers, and evaluators appeared to provide similar services and

produce similar types of products, except that diffusers had

greater (rank-order) output of newsletters and bibliographies, and

evaluators were more apt to design and conduct surveys than person-

nel in the other research-related functions.

JOB TASKS AND KNOWLEDGES/SKILLS

Perhaps the most important data collected by the study

dealt with the job tasks performed and the knowledges/skills

utilized by respondents, since these data have the most direct

implication for training personnel.

It should be emphasized that the data reported in this

section were based on the frequency distributions of responses to

each task and knowledge/skill variable. The actual data collected

were on scales ranging from 0 to 5 (tasks) and 0 to 4 (knowledges/

skills). It was felt, however, that as collected, the data would

not be justified as interval measures, and as ordinal measures

the data would not lend themselves to relevant analyses. There-

fore, the 0 to 5 and 0 to 4 scales data were collapsed to a two

point scale, 0 (do not perform or utilize) and 1 (perform or utilize), for the analyses of job tasks and knowledges/skills data.

Previous analyses of personal characteristics, in-service training, and job description data indicated that there were very few meaningful differences to be found between the vocational and the non-vocational fields within each research-related job function. Therefore, in order to check this finding further, the task and knowledge/skill data were first analyzed to compare vocational researchers with non-vocational researchers, vocational developers with non-vocational developers, etc., for each research-related job function for each task and knowledge/skill. Chi-square contingency tables were utilized to make the tests of independence. The analyses revealed statistically significant Chi-square values ($p \leq .05$) for only variables 92 and 179 when examining researchers; only variable 61 when examining diffusers; and just variable 127 when examining evaluators. No variables were found to be significant when developers were examined. Thus, it appeared that there were few differences between fields within each research-related job function in terms of tasks performed or knowledges/skills utilized.

Given this knowledge of similarity within function, the educational fields were collapsed in order to make analysis among research-related job functions possible. Table 31 presents the numbers of respondents from the vocational, non-vocational, and part vocational part non-vocational fields who were combined within each research-related job function. (It was assumed that

if respondents from the vocational and the non-vocational fields
were similar, then those performing in both fields at once would
not be different from either group.)

TABLE 31

NUMBERS OF RESPONDENTS IN R, D, D, AND E JOB FUNCTION
GROUPS FOR TASK AND KNOWLEDGE/SKILL
CHI-SQUARE DATA ANALYSIS

	Research	Development	Diffusion	Evaluation	Total
Voc Ed	51	60	19	25	155
Non-Voc Ed	22	17	3	15	57
Part Voc Ed Part Non-Voc Ed	30	29	4	12	75
Total in Job Function Group Analyzed	103	106	26	52	287

Table 32 presents the results of analyzing the data from
the tasks performed item (question 20, VAR059 to VAR137) and the
knowledges/skills utilized item (question 21, VAR138 to VAR239).
Chi-square tests of independence were performed to test the rela-
tionship between research-related job functions and whether or not
each task was performed and knowledge/skill utilized. The fre-
quency of response indicating performance of a task or utilization
of a knowledge/skill is shown in the first four of the five
columns of Table 32. An asterisk in the fifth column indicates
that the observed Chi-square value was significant at the .05
level.

— TABLE 32

NUMBER OF RESPONDENTS PERFORMING TASKS AND UTILIZING KNOWLEDGES/SKILLS
FOR ALL FIELDS BUT ONLY R, D, D, AND E FUNCTIONS

$(* = p < .050)$
$(N = 287)$

Var. No.	Tasks	n =	R 103	D 106	D 26	E 52	*
59	Reading recent project-related research		76	76	24	43	*
60	Reading scholarly essays		63	61	23	30	
61	Reading methodological documents presenting information regarding methods of inquiry and/or analysis		75	73	22	43	
62	Reading "in-house" materials and correspondence		76	74	23	44	
63	Editing and/or proofing of printed materials		68	69	22	39	
64	Other		18	19	6	8	
65	Identifying relevant variables for consideration		73	72	16	44	*
66	Developing conceptual frameworks or general patterns of design		74	75	13	43	*
67	Developing methodologies to be used in projects		78	76	16	43	*
68	Organizing a coherent program of activities		7:	75	19	43	*

TABLE 32 (Continued)

Var. No.	Tasks	n =	R 103	D 106	D 26	E 52	*
69	Designating sampling procedures		74	69	10	42	*
70	Designating general statistical treatment to be used		72	63	10	42	*
71	Designing system models for computer application to data		59	39	8	32	*
72	Formulating hypotheses or questions to be answered by research		74	66	14	41	*
73	Determining constraints to problem solution, such as time, money, personnel, and market factors		72	71	17	40	*
74	Developing budgets for tasks or projects		73	68	14	35	*
75	Planning and/or making arrangements for field tests, training, trial centers, demonstrations, installations, etc.		69	73	16	38	*
76	Planning of behavioral, attitudinal, and/or learning change in some target group		61	73	16	31	*
77	Other		12	7	3	1	
78	Constructing questionnaires		72	69	17	42	*
79	Developing test items		72	67	9	35	*
80	Developing interview outlines and schedules		71	62	13	40	*

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TABLE 32 (Continued)

Var. No.	Tasks	R 103	D 106	D 26	E 52	*
81	Developing observational techniques	66	62	11	39	*
82	Identifying appropriate measures for events, variables, other measurement concerns	72	69	10	41	*
83	Fabricating of physical items, such as response recorders, stimulus presentation devices, room partitions or furniture, prototype devices, etc.	33	38	7	15	
84	Other	7	10	1	5	
85	Interviewing	58	60	14	32	
86	Surveying literature	72	70	20	40	
87	Conducting laboratory experiments	40	37	6	12	*
88	Administering questionnaires	64	49	13	35	*
89	Administering tests	55	41	7	26	*
90	Performing aspects of job and/or task analysis	58	61	10	29	*
91	Deriving or otherwise verifying the merit and/or relevance of student performance objectives (behavioral objectives)	55	71	8	38	*

TABLE 32 (Continued)

Var. No.	Tasks	n =	R 103	D 106	D 26	E 52	*
92	Collecting and organizing information relevant to the preparation of a public information, dissemination, product distribution, or marketing plan		59	67	20	38	*
93	Other		6	5	1	2	
94	Preparing or using frequency tallies and/or marginal distributions (as in Chi-square tests)		68	38	6	35	*
95	Computing or using measures of central tendency (i.e., means, medians, modes, arithmetic average)		69	40	7	38	*
96	Computing or using correlation coefficients, including simple correlational analyses		71	39	6	36	*
97	Computing and interpreting simple tests of significance of differences in observed data (such as t-tests)		66	41	6	36	*
98	Computing and interpreting data from analysis of variance designs		65	39	6	32	*
99	Computing and interpreting regression analyses		64	33	5	29	*
100	Examining and interpreting non-quantified information (such as verbal responses, observed activities, etc.)		64	58	9	36	*
101	Computing item analyses of test items		56	36	5	26	*

TABLE 32 (Continued)

Var. No.	Tasks	R 103	D 106	D 26	E 52	*
	n =					
102	Drawing implications from the results of prior research (interpret, evaluate, and synthesize the relevant literature)	72	67	15	39	*
103	Analyzing the nature of various audiences of "publics" to prepare appropriate communications	59	60	16	36	
104	Other	11	3	1	4	
105	Writing correspondence	75	73	24	40	
106	Writing research proposals	73	66	17	36	
107	Writing major project reports	74	70	17	40	*
108	Writing interim, status, or periodic reports	73	73	20	40	
109	Writing for professional publications	71	58	18	34	
110	Writing administrative reports	67	67	20	39	
111	Writing literature surveys	60	44	16	27	
112	Writing of computer programs for data handling or analysis	36	18	3	11	*
113	Writing of programmed instruction outlines and/or frames	33	37	2	8	*

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TABLE 32 (Continued)

Var. No.	Tasks	n =	R 103	D 106	D 26	E 52	*
114	Writing of detailed lesson plans		30	37	2	5	*
115	Other		5	8	6	5	*
116	Procuring, selecting, and assigning project personnel		66	63	15	31	*
117	Establishing contact with and participation by other personnel or agencies		72	72	20	38	
118	Reviewing performance of project personnel		68	68	19	35	
119	Communicating personnel evaluations to individuals		55	64	17	35	
120	Scheduling project activities and/or using PERT scheduling		66	66	16	40	
121	Allocating responsibilities to project personnel		65	68	17	37	
122	Other		8	4	1	4	
123	Participating in classroom instruction		43	39	8	15	
124	Participating in conduct of seminars or workshops		64	66	21	37	
125	Providing on-the-job training to individuals		53	52	16	30	
126	Designing appropriate learning situations		52	59	10	26	

TABLE 32 (Continued)

Var. No.	Tasks	n =	R 103	D 106	D 26	E 52	*
127	Conducting demonstrations of development products before various groups, and answering questions asked by members of the group		50	60	17	28	
128	Preparing visual materials, such as films, slides, video tapes, visual teaching aids, etc.		42	46	18	28	
129	Other		5	3	1	4	
130	Contacts with funding sponsor or monitor of project		63	70	19	33	
131	Contacts with higher agency management for review of project		70	65	15	38	*
132	Presentations made at professional meetings to communicate various aspects of project activities or results		69	72	16	39	*
133	Meeting with visiting personnel from other agencies		76	75	23	41	
134	Conferring with colleagues, staff, and/or students		76	75	23	43	
135	Interacting directly with personnel of other agencies, such as for field tests, at trial learning centers, potential users of R & D products		70	72	19	38	
136	Speaking before public groups or specific target audiences		63	70	19	39	
137	Other		8	8	1	6	

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TABLE 32 (Continued)

Var. No.	Knowledges/Skills	n =	R 103	D 106	D 26	E 52	*
138	Drawing research implications from results of prior research studies		75	71	18	41	*
139	Identifying and delineating significant researchable problems		76	66	17	39	*
140	Procuring and/or managing resources (material and human) necessary to reach research objectives		75	69	18	38	*
141	Interpreting, evaluating, and synthesizing relevant literature		75	76	20	40	*
142	Formulating hypotheses or empirical questions to be answered by the hypothesis		75	67	14	38	*
143	Specifying data or evidence necessary for a rigorous test of the hypothesis		75	65	13	39	*
144	Identifying the population to which results should be generalized and a sample representative of that population, using appropriate sampling techniques to draw the sample		75	64	13	40	*
145	Formulating alternative generalizations from predicted research outcomes		74	65	12	41	*
146	Identifying appropriate research methods		74	69	14	42	*
147	Understanding experimental, quasi-experimental, and other systematic approaches to inquiry, and drawing on such knowledge in designing a research study appropriate to the problem under consideration		76	66	15	40	*

TABLE 32 (Continued)

Var. No.	Knowledges/Skills	R 103	D 106	D 26	E 52	*
	n =					
148	Applying the research design, recognizing, explicating and controlling threats to validity	74	63	12	39	*
149	Identifying classes of behavioral outcomes for measurement	73	72	9	40	*
150	Choosing specific variables and treatments (where appropriate) to be used	75	69	12	40	*
151	Selecting appropriate techniques of measurement	74	71	14	41	*
152	Developing measuring instruments	74	66	12	41	*
153	Assessing the validity of outcome measures	75	70	14	40	*
154	Using a variety of data-gathering methods (tests, interviews, analysis of documents, etc.)	74	69	17	41	*
155	Organizing data for analysis	76	68	17	42	*
156	Understanding the general role, types and assumptions underlying various statistical techniques, and drawing on such knowledge in selecting and using appropriate techniques of data analysis	76	66	13	42	
157	Using aids in data analyses, such as computer processing	72	61	15	42	*
158	Interpreting and drawing appropriate conclusions and implications from data analyses	75	67	16	42	*

TABLE 32 (Continued)

Var. No.	Knowledges/Skills	R 103	D 106	D 26	E 52	*
159	Formulating statements of a theory that offers an explanation (cause-effect relationships) of the behavior under study	72	65	15	40	*
160	Reporting research findings and implications, orally and in writing	76	69	21	41	
161	Other	4	--	--	--	
162	Interpreting information concerning education goals	66	75	20	42	*
163	Drawing on research results in planning developmental activities	68	75	17	40	*
164	Conceptualizing systems, their elements, and interrelations among these elements	66	74	17	41	*
165	Specifying desired performance outcomes (objectives) of instruction	61	75	16	38	*
166	Devising techniques to identify entry capabilities of learners	59	68	12	35	*
167	Describing the product to be developed	61	75	17	34	*
168	Determining appropriate sequences of topics in instruction	58	69	13	32	*
169	Describing the product to be developed	59	75	17	34	*

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TABLE 32 (Continued)

Var. No.	Knowledges/Skills	R 103	D 106	D 26	E 52	*
170	Composing effective oral and written forms of instructional communications	64	70	19	35	
171	Directing the work of production personnel	56	67	17	30	*
172	Selecting or devising appropriate techniques for measuring outcomes	66	71	14	39	*
173	Designing and managing initial laboratory tests of developed techniques and materials	53	59	13	32	
174	Designing and managing field tryouts and tests	61	71	13	35	*
175	Reporting evaluation of outcomes	62	72	17	43	*
176	Interpreting evaluation findings	60	74	17	43	*
177	Specifying requirements for revision based upon outcome evaluations	60	73	15	40	*
178	Other	2	--	--	--	
179	Defining and analyzing characteristics of target group(s)	58	68	23	36	*
180	Selecting from all available information about developed packages that which can be most effectively disseminated	53	68	23	35	

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TABLE 32 (Continued)

Var. No.	Knowledges/Skills	n =	R 103	D 106	D 26	E 52	*
181	Selecting the most effective dissemination vehicles to convey information to target groups		54	67	23	24	*
182	Composing the information, within a chosen format, for accurate and pervasive dissemination		52	67	24	39	*
183	Implementing actual dissemination, including the direction of technical production personnel		52	62	23	31	*
184	Designing and implementing techniques for evaluating the effectiveness of the dissemination effort		50	64	22	34	*
185	Other		5	2	--	1	
186	Specifying nature of the demonstration		43	60	17	28	*
187	Selecting appropriate setting and personnel for demonstration		42	61	17	28	*
188	Managing and coordinating the demonstration effort		42	61	17	30	*
189	Evaluating the effectiveness of the demonstration		43	61	17	35	*
190	Other		4	--	--	3	
191	Identifying features of the adopting organization or system which differ from those in which the product was developed and tested		49	65	16	32	*

TABLE 32 (Continued)

Var. No.	Knowledges/Skills	R 103	D 106	D 26	E 52	*
	n =					
192	Designing modifications of the product to fit the adopting organization or system, when necessary	52	67	18	32	*
193	Designing procedures for modifying the adopting system or organization to fit the product, when necessary, including the design of needed training programs	51	66	18	33	*
194	Identifying potential barriers to implementation	52	69	18	35	*
195	Devising and conducting long-range evaluation of the installed package	51	64	16	34	*
196	Other	1	--	--	1	
197	Identifying goals of the system	56	68	16	39	*
198	Assessing the social relevance of those goals	55	67	16	37	*
199	Identifying values that are implicit in the system goals	55	6;	6	39	*
200	Identifying the nature of the standards or norms the decision makers will apply to interpreting the relevant data which may be provided	56	67	15	40	*
201	Clarifying and explicating desired outcomes of the system	56	69	16	40	*

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TABLE 32 (Continued)

Var. No.	Knowledges/Skills	n =	R 103	D 10b	D 26	E 52	*
202	Measuring current actual outcomes of the system through techniques such as: (1) demographic analysis; (2) economic analysis; (3) psychometric analysis; (4) systems analysis; (5) observational techniques		59	68	13	39	*
203	Comparing actual and intended system outcomes to identify discrepancies (needs) which exist in the system		57	67	16	39	*
204	Explicating the problems that create the needs and diagnosing the causes of these problems		55	66	17	39	*
205	Helping system personnel to develop objectives which, if attained, will satisfy the needs or solve the problems identified above		54	67	19	36	*
206	Designing a monitoring system that will provide continual data (of the type above) on the status of the operating system		53	62	14	36	*
207	Other		8	2	1	1	
208	Designing and selecting indicators or progress in educational programs		56	71	15	40	*
209	Monitoring the program to detect deviations from design or specified procedures through techniques such as unobtrusive measures, systems analysis, and observational techniques		58	68	14	41	*

TABLE 32 (Continued)

Var. No.	Knowledges/Skills (n =)	R 103	D 106	D 26	E 52	*
210	Anticipating predicted barriers and remaining alert to un-anticipated problems that threaten the success of the program	55	73	14	41	*
211	Providing immediate feedback to program operators for their possible use in making decisions about modifications of the plan, procedures or resource allocations	57	71	15	40	*
212	Perceiving human relation problems that threaten the success of the program	57	74	16	42	∴
213	Other	2	--	--	1	
214	Helping system personnel to apply criteria to lists of possible objectives in order to select those which are feasible within constraints of the operating context	54	72	18	38	*
215	Helping system personnel to establish priorities for the selected objectives	54	73	17	38	
216	Identifying and rating alternative strategies for attaining the selected objectives	54	73	17	40	*
217	Identifying and rating available resources (human, material and financial) and/or potential sources of support	54	73	17	37	*
218	Selecting a strategy for implementation	55	73	17	38	*

TABLE 32 (Continued)

Var. No.	Knowledges/Skills	R 103	D 106	D 26	E 52	*
219	Selecting a source of support of the available resources which will be used to implement the program	53	70	16	36	*
220	Predicting the potential barriers to success in the proposed course of action and judging the potential of the strategy for overcoming the estimated procedural barriers	52	71	16	38	*
221	Identifying alternative tactics to implement selected strategy and choosing those that seem most likely to succeed	53	71	15	38	*
222	Other	2	2	--	--	*
223	Applying appropriate designs to evaluation studies	62	67	14	42	*
224	Developing general criteria and designing data collection procedures for application in measuring the effectiveness and efficiency of existing innovative practices and products, i.e., minimum standards and outcomes which indicate successful utilization of practices and products	64	69	13	40	*
225	If necessary, translating objectives into behavioral terms	63	73	15	41	*
226	Identifying situations in which the designated behavior can be observed and recorded	61	71	14	40	*
227	Establishing standards or norms for judging whether objectives have been attained	59	71	15	41	*

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TABLE 32 (Continued)

Var. No.	Knowledges/Skills	n =	R 103	D 106	D 26	E 52	*
228	Selecting (or developing) and using techniques of measurement to yield information relevant to these standards		62	69	15	41	*
229	Assessing the validity of outcome measures		63	66	15	41	*
230	Collecting and organizing the data preparatory to analysis		66	66	15	42	*
231	Selecting an appropriate technique to analyze the data		65	66	14	41	*
232	Analyzing the evidence yielded by the evaluation		64	70	14	43	*
233	Judging the strengths and weaknesses of the plans and procedures employed for meeting the project objectives		62	70	15	41	*
234	Deciding how to explain the outcome as a function of plans, procedures, and resources		60	70	15	42	*
235	Deciding what recommendations to make as a result of the outcomes		60	71	14	43	*
236	Estimating the potential impact of the outcomes on the problem		61	71	14	40	*
237	Providing sufficient information to the decision-maker to enable him to decide whether to continue, modify, or terminate the activity or process evaluated		63	71	16	42	*

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TABLE 32 (Continued)

Var. No.	Knowledges/Skills	n =	R 103	D 106	D 26	E 52	*
238	Specifying changes that need to be made in the context evaluation system due to decisions about program continuation		60	68	15	41	*
239	Other		--	1	--	2	

When comparing the RDDE respondents, significant Chi-square values were observed for 40 out of 70 specified tasks (excluding "other", fill in the blank responses) and 88 out of 93 specified knowledges/skills. (In fact, seventy-two of the one-hundred and twenty-eight significant Chi-square values had probabilities of less than .001.)

These findings, that 128 out of 163 variables showed a significant relationship between job function and whether or not the task was performed or the knowledge/skill utilized, indicated important differences among RDDE job requirements. An exact interpretation of the differences among the job functions was difficult to determine from the separate Chi-square tests, however.

Table 33 presents a summary of the data in Table 32. It indicates which job function groups or group were thought to account most for each significant relationship found between job function and task or knowledge/skill variable. The groups indicated as accounting for most of the relationship were so designated because respondents from them did not perform the task or utilize the knowledge/skill to the extent that respondents from other groups did. The groups accounting for the differences were determined by inspection of the contingency tables.

The synthesis of these differences is difficult since one cannot be sure of what significance the performance of one task or the utilization of one knowledge/skill as compared to another has for defining the totality of RDDE activities.

TABLE 33

R, D, D, AND E FUNCTION GROUPS ACCOUNTING FOR SIGNIFICANT
DIFFERENCES IN TASK AND KNOWLEDGES/SKILLS VARIABLES

(N = 287)

Cluster Name	Significant Variables		Group Accounting for Difference[*]			
	Var. No.	No. of	R	D	D	E
Reading	59	1		X		
Designing or Planning Procedural Activities	65-75	11			X	
	76	1			X	X
Developing Research & Information Gathering Tools	78-82	5			X	
Collecting Project Data	88-92	5			X	
	87	1			X	X
Analyzing Data	100-102	3			X	
	94-99	6		X	X	
Writing	107,112	2			X	
	113-114	2			X	X
Coordinating-People	116	1			X	X
Meeting/Consulting	131-132	2			X	
Research	138-159	22			X	
Development	171,174	2			X	
	162-166,176-177	7	X		X	
	175	1		X	X	
	167-169,172	4	X		X	X
Dissemination	179,181-184	5	X			
Demonstration	186-189	4	X			
Facilitating Adoption	191-195	5	X			
Context Evaluation	197-204,206	9	X		X	
	205	1	X			
Process Evaluation	208-212	5	X		X	
Program Planning	214,216-221	7	X		X	X
Outcome Evaluation	223-228,232-238	13	X		X	
	229-231	3	X	X	X	

[*] These groups did not perform the task or utilize knowledge/skill to the
extent the other groups did.

In order to gain a better understanding of how job tasks and knowledges/skills cluster around RDDE functions, the cluster analysis, as reported in the next section, was performed.

CLUSTER ANALYSIS

To perform the job clustering analysis, the Computerized Occupational Data Analysis Programs (CODAP) system cf the U.S. Marine Corps was used.

The basic underlying procedure of job clustering in the CODAP system is the computation of an individual's percent time spent on activities and comparison of these percents across individuals and/or jobs. Table 34 provides a brief display of how these calculations are made.

TABLE 34

EXAMPLE OF CALCULATION OF PERCENT TIME SPENT ON TASKS

Task	Researcher 1		Researcher 2		Developer 1		Developer 2	
	R*	% Time	R*	% Time	R*	% Time	R*	% Time
A	5	62.5	2	13.4	0	0	0	0
B	3	37.5	3	20.0	0	0	0	0
C	0	0	5	33.3	1	33.3	4	44.4
D	0	0	5	33.3	2	66.7	5	55.6
Sum	8	100.0	15	100.0	3	100.0	9	100.0

*Assume the following rating scale (R) was used:

        0 = no part of work
        1 = minor part of work
        2 = below average part of work
        3 = average part of work
        4 = above average part of work
        5 = very major part of work

The "% Time" column indicates the percent of total time spent on each task, the sum of those percents accounting for all of the person's time. To describe researchers and developers in the example, or any other input groups, the CODAP system computes the average percent time spent on all tasks for all members in a defined group who perform the tasks and indicates the order in which time for the entire group is allotted to the tasks listed. Comparison of people within and between defined job function groups can then be shown in terms of which tasks or knowledges/skills are performed or utilized to the greatest extent.

For this study the CODAP system operated on groups of Tasks and Knowledges/Skills variables called "duty areas". These duty areas, alphabetically labelled from A to R in this study, were identified with terminology consistent with the broad general-area headings given to each set of Tasks and Knowledges/Skills. Table 35 shows the list of these duty areas. Reference to Appendix F will give a complete itemization of which tasks and knowledges/skills items were grouped into duty areas.

Data from only the vocational and non-vocational field respondents who classified themselves in the R, D, D, or E function were analyzed using the CODAP system (N=212).

Tables 36 and 37 present the data on tasks performed for R, D, D, and E functions for the vocational and non-vocational fields. Table 36 shows the ranking, based on cumulative percent time spent by each functional group, for Task clusters A to I, for the combined vocational and non-vocational fields.

TABLE 35

LIST OF "DUTY" AREAS

Code	No. Tasks in Duty	Duty Title
A	6	Reading
B	13	Designing or Planning Procedural Activities
C	7	Developing Research Tools-Information Gathering Tools
D	9	Collecting Project Data
E	11	Analyzing and Interpreting Data
F	11	Writing
G	7	Supervising and Coordinating People and/or Resources
H	7	Teaching or Training
I	8	Meeting, Consulting or Advising
J	24	Research Knowledges/Skills
K	17	Research Based Development Knowledges/Skills
L	7	Diffusion Knowledges/Skills
M	5	Demonstration Knowledges/Skills
N	6	Facilitating Adoption Knowledges/Skills
O	11	Context Evaluation/Situation Analysis Knowledges/Skills
P	6	Process Evaluation/Program Monitoring Knowledges/Skills
Q	9	Program Planning/Input Analysis Knowledges/Skills
R	17	Outcome Evaluation Knowledges/Skills

*Refer to Appendix F for complete list of tasks and knowledges/skills grouped under each "duty" area.

TABLE 36

TASK CLUSTER RANKING BY PERCENT TIME SPENT BY RESPONDENTS FOR R, D, D, AND E
FUNCTIONS WITHIN COMBINED VOCATIONAL AND NON-VOCATIONAL FIELDS ONLY

(N = 212)

Rank	Researchers		Developers		Diffusers		Evaluators	
	Cluster	% Time	Cluster	% Time	Cluster	% Time	Cluster	% Time
1	B	20.6	B	21.5	A	17.1	B	21.4
2	E	14.2	I	13.7	B	15.6	I	12.4
3	F	13.0	F	12.8	F	15.2	F	11.9
4	I	11.1	G	11.0	I	13.3	E	11.4
5	D	8.9	D	9.5	H	10.1	D	10.0
6	C	8.5	E	8.5	D	9.6	G	9.8
7	G	8.5	A	8.3	G	8.7	C	9.3
8	A	8.3	H	7.0	E	5.7	A	c. ,
9	H	55.8	C	6.9	C	3.8	H	4.5
Number in Group	73		77		22		40	

Account for 57-61% of total time

Clusters (duties) B (designing or planning procedural
activities), F (writing), and I (meeting, consulting, or advising)
were among the top four time-consuming duties common to all RDDE
functions. Of the other top four time-consuming duties, cluster
E (analyzing and interpreting data) was common only to researchers
and evaluators; cluster G (supervising and coordinating people
and/or resources) was unique to developers; and cluster A (reading)
was unique to diffusers. Together, these top four duties accounted
for 57% to 61% of the total time spent on research-related tasks.

Table 37 presents the data for the individaul RDDE func-
tions within each of the vocational and non-vocational fields.
Only within the diffusion and evaluation functions were some small
differences noted in the percent of time spent performing duties
(primarily clusters A and E) between the vocational and non-
vocational respondents. Within the research and development
functions the rankings were identical for both fields.

In terms of Knowledges/Skills (clusters J to R), Tables
38 and 39 present the rankings of these clusters. The interesting
fact revealed in Table 38 was that all four functional groups spent
from 56% to 68% of their time utilizing Knowledges/Skills clusters
J (research knowledges/skills), R (outcome evaluation knowledges/
skills), and K (research based development knowledges/skills).
Only in cluster L (diffusion knowledges/skills) did the functional
groups differ to some degree.

TABLE 37

TASK CLUSTER RANKING BY PERCENT TIME SPENT BY RESPONDENTS FOR R, D, D, AND E
FUNCTIONS WITHIN VOCATIONAL AND NON-VOCATIONAL FIELDS ONLY

(N = 212)

	Research				Development				Diffusion				Evaluation			
	Voc		Non Voc		Voc		Non Voc		Voc		Non Voc		Voc		Non Voc	
Rank	Cluster	% Time	Cluster	% Time	Cluster	% Time	Cluster	% Time	Cluster	% Time	Cluster	% Time	Cluster	% Time	Cluster	% Time
1	B	19	B	21	B	21	B	24	B	17	P	18	B	20	B	21
2	E	14	E	17	I	13	I	14	A	15	B	17	I	12	E	14
3	P	13	P	13	F	12	P	13	P	15	I	13	F	12	I	12
4	I	11	I	10	G	12	G	12	I	12	E	12	E	11	F	11
5	D	9	D	8	D	10	D	9	H	10	A	10	C	11	A	10
6	C	9	C	8	F	9	F	9	D	10	D	10	D	11	D	9
7	G	9	G	8	A	8	A	7	C	9	C	7	C	10	G	9
8	A	9	A	8	H	8	H	6	E	7	H	7	A	8	C	9
9	H	7	H	7	C	7	C	6	C	5	G	6	H	5	H	-
Number in Group	51		22		60		17		19		3		25		15	

TABLE 38

KNOWLEDGES/SKILLS CLUSTER RANKING BY PERCENT TIME
SPENT BY RESPONDENTS FOR R, D, D, AND E FUNCTIONS
WITHIN COMBINED VOCATIONAL AND NON-VOCATIONAL FIELDS ONLY

(N = 212)

Rank	Research		Development		Diffusion		Evaluation	
	Cluster	% Time	Cluster	% Time	Cluster	% Time	Cluster	% Time
1	J	35.2	J	22.8	J	23.0	J	26.1
2	R	17.3	K	20.1	K	17.9	R	20.4
3	K	16.3	R	17.4	R	14.6	K	15.9
4	O	8.5	O	10.0	L	12.9	O	10.8
5	Q	6.5	Q	9.6	O	8.6	Q	7.5
6	L	4.9	P	5.9	Q	8.0	P	5.9
7	N	4.4	L	5.5	N	5.3	L	4.7
8	P	4.3	N	4.9	M	4.7	N	3.8
9	M	2.4	M	3.6	P	4.5	M	2.7
Number in Group	73		77		22		40	

Account for 56-68% of total time

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TABLE 39

KNOWLEDGES/SKILLS CLUSTER RANKINGS BY PERCENT TIME SPENT BY RESPONDENTS FOR R, D, D, AND E FUNCTIONS WITHIN VOCATIONAL AND NON-VOCATIONAL FIELDS ONLY

(N = 212)

Rank	Research Voc Cluster	% Time	Research Non Voc Cluster	% Time	Development Voc Cluster	% Time	Development Non Voc Cluster	% Time	Diffusion Voc Cluster	% Time	Diffusion Non Voc Cluster	% Time	Evaluation Voc Cluster	% Time	Evaluation Non Voc Cluster	% Time
1	J	29	J	35	J	23	J	21	J	19	J	18	J	26	J	20
2	R	18	R	16	K	19	K	19	K	18	O	15	R	20	R	20
3	K	15	K	16	R	18	R	18	R	16	R	12	K	16	K	16
4	O	10	O	8	O	10	O	11	L	14	L	11	O	11	O	13
5	Q	8	Q	7	Q	9	Q	10	O	9	K	10	Q	8	Q	8
6	L	6	L	5	P	6	P	6	Q	8	Q	10	P	6	P	6
7	N	5	N	5	L	6	L	6	N	6	P	9	L	5	N	4
8	P	5	P	4	N	5	N	5	M	5	M	8	N	5	L	5
9	M	4	M	4	M	4	M	4	P	5	N	7	M	3	M	2
Number in Group	51		22		60		17		19		3		25		15	

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Table 39 displays the data for RDDE functional groups within each of the vocational and non-vocational fields. As in Table 37, the rankings between vocational and non-vocational personnel within the diffusion function were slightly different, but the rankings within the research, development, and evaluation functions were almost identical.

The cluster analysis, therefore, showed a marked similarity between the RDDE functional groups in terms of the percents of total time they devoted to the same task clusters and the time they utilized the same knowledges/skills clusters.

NON-RESPONDENT TELEPHONE INTERVIEW DATA

A telephone interview was conducted for a stratified (by state) random sample of 100 individuals, two per state, selected from the list of non-respondents to the mailed survey questionnaires.

Sixty-four persons were contacted, while 36, no longer at the location given on the mail list, could not be contacted.

Some persons did not answer all of the questions as asked, but of those who did, 38 indicated receiving the survey correspondence, while 24 didn't; 14 persons returned the questionnaires (although the study never received them, probably due to loss in the mails). Reasons given for not filling out the questionnaires included (a) didn't have time (17), (b) didn't see value of survey (1), (c) questionnaire too long (4), and (d) other (6).

Thirty-six (56.2%) of the 64 interviewees spent 25% or more time on RDDE activities, 25 (39.0%) spent less than 25%, while 3 (4.6%) had no reply.

Table 40 presents the classification by educational field and job function of the telephone respondents. Place of work for the telephone interviewees is shown in Table 41, while highest degree held data is shown in Table 42. With such small numbers of respondents, Tables 41 and 42 were not broken down by field or function.

Inspection of the data from the telephone interview group with that of the mail-questionnaire survey respondents on variables indicating place of work, highest degree held, and educational field showed that the two groups were almost identical. There were, however, proportionally more teachers and administrators in the telephone interview group than there were in the mailed-questionnaire response population.

There is no reason to assume that the data from the mailed questionnaire respondents is very much different from that which might have been obtained from the non-respondents (N=499), except that the latter might contain a higher proportion of persons who classify themselves as teachers and administrators.

SUMMARY

This chapter provided a summary of the data collected (191,129 bits) for the study. With so many possible ways of com-bining and cross-tabulating available data, the chapter is, in

TABLE 40

EDUCATIONAL FIELD BY JOB FUNCTION CROSS-TABULATION FOR TELEPHONE INTERVIEWEES

(N = 64)

	Research	Development	Diffusion	Evaluation	Teaching	Administration	Other	Combination	Missing Data	Total
Voc Ed	5	4	2	3	6	5	3	--		28
% of N	7.8	6.2	3.2	4.6	9.3	7.8	4.6	--		43.7
Non-Voc Ed	2	1	1	1	2	2	1	--		10
% of N	3.2	1.5	1.5	1.5	3.2	3.2	1.5	--		15.6
Part Voc Part Non-Voc	5	3	--	1	6	5	2	--		22
% of N	7.8	4.6	--	1.5	9.3	7.8	3.2	--		34.3
Missing Data	1	1	--	--	--	1	1	--	4	4
Total	13	9	3	5	14	13	7	--		64
% of N	20.3	14.0	4.6	7.8	21.8	20.3	10.9	--	6.2	100

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TABLE 41

PLACE OF WORK FOR TELEPHONE INTERVIEWEES

(N = 36)

Place of Work	Number	% of N
Universities	16	44.4
Junior Colleges	2	5.6
Technical Institutes	1	2.8
R & D Centers	2	5.6
State Education Agencies	3	8.3
Regional Labs	1	2.8
K-12 School Districts	7	19.4
Other	2	5.6
No Response	2	5.6

TABLE 42

HIGHEST DEGREE HELD BY TELEPHONE INTERVIEWEES

(N = 36)

Degree	Number	% of N
Doctorate	16	44.4
Specialist	1	2.8
Masters	15	41.7
Bachelors	2	5.6
Associate	1	2.8
No Response	2	5.6

some ways, rather short. Focusing on personnel with research, development, diffusion, or evaluation functions within the vocational and non-vocational fields provided one means of limiting, reporting, and providing the information most pertinent to the objectives of the study.

Anyone interested in performing additional analyses may contact the author for the data.

Overall, the analyses provided evidence that vocational, non-vocational, and even part vocational part non-vocational (job field) personnel, are, for all practical purposes, not very different from each other in terms of their general (personal) characteristics, in-service training, and job description. But, research, development, diffusion, and evaluation personnel in those fields are different from each other in terms of the proportions who perform certain tasks and who use certain knowledges/skills. In terms of the time they devote to clusters of tasks and knowledges/skills, however, considerable similarity was revealed.

Chapter 6

SUMMARY AND CONCLUSIONS

PROBLEM AND PROCEDURES

The problem dealt with in this study was based on the lack
of information for defining and describing research, development,
diffusion, and evaluation (RDDE) personnel and activities in voca-
tional education.

The purposes of this study were to identify RDDE personnel
in vocational education, and to collect data describing those people
and their jobs.

Approximately 167 letters were sent requesting persons
located in Research Coordinating Units, State Departments of Edu-
cation, federal offices, R & D centers, corporations, foundations,
professional education associations, etc. to identify vocational
education RDDE personnel. Then, a search was made of a variety of
indexes (e.g., ARM, AIM, RIE, Dissertation Abstracts) to gather
names of persons possibly engaged in vocational education RDDE
activities. And last, survey respondents from that "first approxi-
mation population" were requested to indicate other vocational RDDE
personnel in their geographic area. A total group of 1,962 persons
possibly engaged in vocational education RDDE activities was thus
identified.

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A survey questionnaire was formulated to collect data about various characteristics of the group identified and their jobs. Questionnaire items about tasks performed and knowledges/skills utilized were taken from studies done in Colorado (Worthen and others, 1971) and Oregon (Schalock and others, 1972).

Two forms of the questionnaire, one long-form (Appendix B) and one short-form (Appendix D), along with the necessary cover letters, instructions, and return-mail procedures and material were developed. The long-form was the "first mailing" questionnaire which provided most of the data for the study. A first follow-up consisted of a "reminder-to-participate" postcard (Appendix C). The short-form questionnaire was used as a second follow-up. A stratified (by state) random sample of 100 non-respondents was also interviewed by telephone to collect some basic information about the non-respondent group.

Data from the questionnaires were summarized using frequency tabulations, and, where appropriate, measures of central tendency and deviations. The Chi-square statistic was used with nominal data to make appropriate tests whenever cell frequencies permitted such tests. An additional analysis procedure, the Computerized Occupational Data Analysis Programs of the Marine Corps (Oats-Hills Consultants, 1970), was employed to compare groups of respondents in terms of the time devoted to clusters of job tasks performed and knowledges/skills utilized.

The response rate to the questionnaires was quite good. A total group of 1,962 persons was surveyed, with 786 (40.0%)

returning fully completed questionnaires, and 344 (17.5%) returning questionnaires indicating that they spent less than 25% time on RDDE activities. Sixty-four persons (3.3%) were interviewed by telephone, 43 persons (2.2%) did not wish to participate, and 16 (.8%) returned questionnaires after the deadline date for inclusion into data analysis. Two-hundred and ten persons (10.7%) could not be located by any practical means. No information was obtained from four hundred and ninety-nine (25.4%) other persons.

FINDINGS

Respondents to the questionnaires classified themselves according to educational field: 373 persons (47.4%) were in vocational education, 147 (18.7%) were in non-vocational education, 247 (31.4%) were part-vocational and part non-vocational, and 19 (2.4%) persons provided no data. The fact that 147 persons, thought to be in the vocational education group identified themselves as being in non-vocational education was an unexpected result, but did allow the study to perform comparisons between vocational and non-vocational personnel. It should be remembered, however, that the group of non-vocational educators employed in this study was not a random selection from a predetermined population. The extent to which this group is representative of the entire population of non-vocational RDDE personnel is not known.

The large number of personnel who indicated they were conducting activities which were partly vocational and partly non-vocational in nature lead to the conclusion that, although there

were different terms (e.g., vocational and non-vocational education) to describe the contextual, or subject matter, emphasis of a particular type of educational activity, there was a distinct problem in classifying one's educational field too strictly.

Of the total group of 1,962 people surveyed, 786 (40.0%) indicated they spent 25% or more time on RDDE activities. One-hundred and fifty-five (19.7%) of the 786 considered themselves either researchers, developers, diffusers, or evaluators in the vocational education field, while 57 (7.2%) respondents considered themselves either researchers, developers, diffusers, or evaluators in the non-vocational field.

One aspect of the data analysis described and compared respondents from the vocational and non-vocational fields. Very few differences were found between the two fields in terms of the proportion of time (as measured by percents) respondents devoted to nine clusters of job tasks and nine clusters of knowledges/skills (each cluster being composed of a number of related tasks or knowledges/skills variables). The results suggested that no important distinctions existed between vocational and non-vocational groups in terms of their job activities and the knowledges/skills clusters they utilized.

One difference found between vocational and non-vocational respondents, however, was their place of work. Whereas the non-vocational personnel were mainly located in independent research agencies and state departments of education, a higher proportion of vocational personnel were located in technical institutes,

research and development centers, research coordinating units, and federal agencies. Place of work (in addition to focus of problem areas) seemed to be the most important difference between the vocational and the non-vocational RDDE personnel who provided data for this study.

A second aspect of the data analyses examined differences among research-related job functions--research, development, diffusion, and evaluation. This comparison revealed the most significant results of the study. Two-hundred and eighty-seven (36.4%) of the respondents classified themselves as either researchers, developers, diffusers, or evaluators: 103 as researchers, 106 as developers, 26 as diffusers, and 52 as evaluators.

These R, D, D, and E functional groups appeared to have similar characteristics on variables such as sex, age, degrees held, association memberships, majors, minors, in-service training needs and recent in-service training participation, and agreement with the definitions provided by the study. However, differences occurred in certain other general background information; in years experience in various defined areas, researchers as a group had an average of 18 years experience in other educational employment as compared to an average of almost 6 years for developers, 4 years for diffusers, and 5 years for evaluators. It is also interesting to note that the average number of years spent in the present employment position for all vocational and non-vocational RDDE personnel was 3.9 years, with diffusers being in the job an

average of 6 years, and developers, researchers, and evaluators
being in the job an average of only 3.6 years.

In terms of percent time spent in RDDE activities, the
highest mean percent time was spent in the kind of activity whose
title defined the function (e.g., researchers spent most of their
time on research activities, developers in developmental activi-
ties, etc.), with the remainder of time spent on varied activities.

Place of work also varied by job function. Proportionally
most researchers were located in universities and independent
research agencies; more developers were found in junior colleges,
regional and K-12 school districts; more diffusers were located in
professional education associations; and more evaluators were in
technical institutes, state education agencies, and federal
agencies.

With regard to job products and services produced by the
job, the diffusers produced more bibliographies than the other
three groups; developers produced more training packages; evalua-
tors produced a greater proportion of survey designs/conducted
surveys; and researchers produced a higher proportion of methodol-
ogies. On other job products and services items, the four groups
were similar.

With respect to in-service training needs, the groups were
generally similar with the exception that more researchers wanted
research design and survey methodology training, more developers
wanted survey methodology and measurement/testing training,

diffusers wanted more administration/management training, and evaluators wanted program-planning-budgeting training.

Although the above mentioned differences helped to distinguish and describe the R, D, D, and E groups, the major distinguishing factors found were those of specific job tasks performed and knowledges/skills used. The groups differed in the percent who performed 40 out of 70 specified tasks and who utilized 88 of 93 specified knowledges/skills. The results seemed to indicate that the four functional groups dealt with different tasks and utilized different knowledges/skills in their work.

When the tasks were clustered and the functional groups were compared in terms of the average percent time devoted to each cluster of tasks, it was found that researchers, developers, diffusers, and evaluators alike devoted most of their time to a) designing and planning procedural activities, b) meeting/consulting/advising, and c) writing. However, while researchers and evaluators also spent considerable time analyzing and interpreting data, developers supervised and coordinated people and resources, and diffusers devoted more time to reading.

In terms of clusters of knowledges/skills, all four groups spent a total of from 56% to 68% of their time utilizing a) research knowledges/skills, b) research-based development knowledges/skills, and c) outcome evaluation knowledges/skills. Only in terms of time devoted to diffusion knowledges/skills did one group (diffusers) exceed the other groups.

CONCLUSIONS

The findings of this study, as summarized in the previous section, answered the questions posed by the study. Since the respondents who supplied the data cannot be considered a random sample from some population, no attempt was made to generalize beyond the findings. Rather, the conclusions better serve to summarize the judgements of the author concerning the findings.

First, the terminology used to classify research-related personnel as being either in the vocational education or non-vocational (general academic) education fields was, at best, a means of identifying the subject matter focus for their work and, perhaps, a means of indicating the institutional settings in which they conduct their work. It was not a meaningful way to distinguish among research, development, diffusion, and evaluation personnel in terms of the nature of their activities. Comparison of the general (personal) characteristics of "vocational" and "non-vocational" education field respondents showed there were some differences, but none which would very meaningfully separate one group from another. In terms of the job tasks they perform and the knowledges/skills they utilize, the two fields seemed very similar.

Second, there were distinct differences in the proportions of researchers, developers, diffusers, and evaluators who performed specific tasks and who utilized certain knowledges/skills. However, the exact meaning of these differences for the purposes of identifying distinct research-related job functions needs

further investigation. The relationships between tasks performed and knowledges/skills utilized and other aspects of RDDE jobs, such as institutional settings, job outcomes, and previous work experience, also need to be studied.

Third, there were a few recognizable differences between the RDDE functional groups when comparisons were made for the percent of time devoted to clusters of similar tasks. However, fewer differences were shown in percent time the groups spend utilizing clusters of similar knowledges/skills.

Fourth, it appeared that identifying specific job outcomes, that is, products and services, may be a useful indicator of job functions and of what goes on in those functions.

Chapter 7

IMPLICATIONS AND RECOMMENDATIONS

In light of the results of this study, several recommendations can be made regarding further investigations and several implications drawn for RDDE training.

First, it seems quite appropriate to suggest that more work be done to locate vocational RDDE personnel and to maintain an up-to-date locator list of them. Efforts to create such a list, such as those which resulted in the National Register of Educational Researchers, should be continued on a regular basis to keep it up-to-date. Not only would such a list make it easier for funding agencies to utilize the pool of RDDE personnel interested in vocational education problems, but it would, if made available to all persons on the list, enhance the communications network in vocational educational RDDE.

Second, more work is needed to describe the tasks performed and knowledges/skills used in, and the outcomes of R, D, D, and E activities. Although first attempts have now been made (by the Colorado and Oregon studies and by this study) to define and gather data describing the work and the products of R, D, D, and E personnel, there is a need to refine the information.

Although we have the theoretical, conceptual, and first-time-data bases for discussing RDDE, widely accepted definitions and descriptions of R, D, D, and E activities are need so that the

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differences and similarities between the R, D, D, and E functions

can be fully understood. Such an understanding could be an

invaluable tool in determining which activity, R, D, D, or E, or

combination of activities could best accomplish any one or several

of the goals formulated to produce specific products and services.

Third, the data from this study and the Colorado and Oregon

studies should prove useful in the development of pre-service and

in-service training programs for R, D, D, and E personnel. That

is to say, training programs should reflect, to a considerable

degree, the skills currently needed in the "real world." Skills

not being practiced, but which "should be", do have a place in

planning training programs, but is is also important not to neglect

the realistic needs of the present roles, especially to the degree

that those roles adequately attend to the functional requirements

of the profession. For RDDE training programs to realistically

train personnel for RDDE activities, to equip persons to rapidly

become active and productive "RDDE'ers", the programs must be

reasonably consistent with extant job requirements, and should

therefore reflect the results of this study, the Colorado study,

and the Oregon study.

Fourth, the results of this study imply that much of the

pre-service training programs of all R, D, D, and E personnel may

be common. The major differences among the four job functions are

variations in emphasis and applications, while the major differ-

ences between vocational and non-vocational personnel are in their

substantive area of study. For these differences in emphases,

applications, and subject field, the training programs may have to concentrate on providing specialization for advanced research-related content as well as different opportunities to apply that content.

Fifth, the need revealed by this study for in-service training programs suggests that many such opportunities should be provided. Each in-service need should be met by having a number of training programs offered at various places throughout the country at various times throughout the year. It is difficult to judge whether it is lack of time and money, lack of motivation, or lack of enough training programs which causes only 50% of the population surveyed to participate in these types of programs. But based on the self-professed need for in-service training, it seems probable those needs can better be met if arrangements can be made to provide programs which are conveniently offered, have relevant and challenging content, and reduce financial restrictions to a minimum. The need for a constant updating of the knowledges and skills of the RDDE community is vitally important if the qualitative demands placed on its varied products and services are to be satisfied.

In summary, it is quite necessary that the community of educational researchers, developers, diffusers, and evaluators conduct investigations of their own activities with the end result of improving the quality of those activities. This study has been one of several attempts to study RDDE activities and personnel in order to provide information which may assist in their improvement.

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    November, 1971.

APPENDIXES

APPENDIX A

Letter Requesting Names of Vocational

RDDE Personnel-General Format

UNIVERSITY OF *Minnesota*

PROJECT STATUS (612) 376-7430

July 30, 1971

Dear   :

During the coming year I will be conducting a USOE sponsored project to locate,
and survey a nation-wide population of people conducting research, development,
diffusion, and evaluation activities in vocational-occupational (career)
education.

This project will attempt to locate these people and collect data concerning
their roles, tasks, training, skills, knowledges, and products and services.
The data will help to describe the current status of vocational RDDE personnel.

The biggest problem in the project is locating the people. I would, therefore,
appreciate any assistance you might be able to provide in locating that
population.

Of particular interest to me would be the names and addresses of people from
the below listed institutions who might be conducting RDDE activities:

1. RCU
2. State Department of Education
3. Colleges and Universities-public and private
4. Vocational Schools-public and private
5. Industry and Business
6. Private Foundations and Professional Associations (directories, etc.)
7. Elementary, Junior and Senior High Schools

If you could provide me with the names and addresses (or where I could secure
such information) of those people whom you know or believe are conducting some
RDDE activities in vocational-occupational education it would b of tremendous
help to me.

If you have any questions or comments about the project please contact me at the RCU.

Thank you very much for your time and cooperation.

Sincerely,

Paul E. Schroeder
Project Director

PES:rw

The letter content shown in this appendix is a generalized version of the requests for names sent to:

1. state directors of vocational education
2. professional associations
3. research coordinating units
4. foundations, institutes, and government offices
5. special individuals and organizations

The general tone of the letters was similar. Slight changes were made in the format to reflect the nature and type of name-resource being written to.

APPENDIX B

Survey Questionnaire-Long Form

B-1 Cover Letter
B-2 Questionnaire

UNIVERSITY OF *Minnesota*

November 30, 1971

Dear Colleague:

The enclosed questionnaire is part of a study to locate, collect descriptive data about, and compare personnel conducting research, development, diffusion, and evaluation (RDDE) activities in both vocational and non-vocational education fields.

The data resulting from the study is designed to be used in making decisions concerning the planning and allocation of human, financial, and material resources for RDDE activities themselves, and pre-service and in-service training programs for educational RDDE personnel.

If you 1) have spent an average of 25% or more time in each of the past two years, or 2) are now spending 25% or more time on RDDE activities, please fill out the entire questionnaire. If you do not fall into either of the above categories please check the box in the upper left corner of page 1, answer questions 1 through 10 on page 3, and return the questionnaire. If you know of anyone in your local vicinity who spends 25% or more time on RDDE activities, please fill in question 27 on page 15 regardless of your time status.

All individual responses are completely confidential and will be reported in statistical form only. Questionnaire code numbers are for computer identification only.

I would appreciate your completing the questionnaire and returning it within one week. A stamped, addressed envelope is provided for your convenience. I will be happy to send you a summary of the results of the survey if you wish one; just check the box in the lower right corner of page 1.

If you have any comments concerning the study, please note them on the questionnaire "comments" page or contact me.

Thank you very much for your time and cooperation.

Sincerely,

Paul E. Schroeder

Paul E. Schroeder
Project Director

PES/kw

Enclosures.

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Check Box if you spend less than 25%
time on RDDE activities, then answer
questions 1 through 10 on page 3, and
item 27 on page 15.

Roles, Tasks, Training, Skills, Knowledges, Products, and

In-Service Training Needs Inventory

Instructions

The purpose of this inventory is to gather information about the actual back-
grounds and opinions of professional persons who perform Research, Development,
Diffusion, and Evaluation (RDDE) activities in both vocational and non-vocational
education fields.

Please respond as candidly as possible. Your responses will be kept confiden-
tial and the compilations made from these inventories will be reported in statistical
form only.

There are no right or wrong responses and no preferred pattern of response.

Mark your responses and comments clearly and legibly and make any supplementary
notations regarding pertinent information in the margins, the writing spaces provided
for "other" responses, or on the "comments" page.

If you 1) have spent an average of 25% or more time in each of the past two years,
or 2) are now spending 25% or more time on RDDE activities, please fill out the entire
questionnaire. If you do not fall into either of the above categories please check
the box in the upper left corner of this page, answer questions 1 through 10 on page
3, and item 27 on page 15.

Thank you.

Check Box if you wish a summary
of the results of the survey.

2

DEFINITIONS USED IN THIS STUDY

Educational RDDE: A coordinated set of strategies which produce recognizable products that can be judged as to their quality and their contribution to the solution of an educational problem.

Educational Research: A coordinated set of activities which produce reliable knowledge, that is, facts, principles, generalizations, theories, and laws that can stand the test of empirical verification.

Educational Development: A coordinated set of activities which produce reliable technology, that is, procedures, materials, hardware and organizational frameworks that have a known degree of success in bringing about a particular outcome or in performing a defined operation.

Educational Diffusion: A coordinated set of activities which lead to the adoption and/or utilization of generalizable knowledge, reliable technology and trustworthy information.

Educational Evaluation: A coordinated set of activities which produce trustworthy information in support of decision making, that is, observations, reports, and data derived through formal or informal measures which are presented to decision makers in a form and within a time which permits its utilization in the decision making process.

Vocational Education: Training, retraining, or upgrading which is given in schools, classes, or other locations (factories, store front centers, etc.), including field or laboratory work and remedial or related academic and technical instruction incident thereto, under public or private (trade schools, union programs, business and industry programs, etc.) supervision and control or under contract with a state or local education agency, and is conducted as part of a program designed to prepare or upgrade individuals for gainful employment as semiskilled or skilled workers or technicians or sub-professionals in recognized occupations and in new and emerging occupations, or to prepare individuals for enrollment in advanced technical education programs, but excluding any programs to prepare individuals for employment in occupations generally considered professional or which require a baccalaureate or higher degree.

Manpower: Referring to or dealing with the persons (their characteristics, educational and training background, and socio-economic status) available for the production, management, professional, and service functions of an economy.

PERSONAL BACKGROUND SECTION   3

INSTRUCTIONS: Check the line✓opposite each item that applies to you, or write in the
             data required.

1. Name_____
                  Last   First   Middle Initial

2. Position or Title_____ .

3. Business Address_____

4. Institution Name_____

5. City_____ 6. State_____ 7. Zip Code_____

8. Telephone_____ 9. Sex:__Male__Female   10. Age_____

---

11. Check the degrees you hold
___Doctorate
___Specialist of Professional
___Masters
___Bachelors
___Associate
___Technical License
___None of these
___Other:_____

12. National Professional Organization Memberships
___AERA (American Educational Research Association)
___NEA (National Education Association)
___AVA (American Vocational Association)
___APGA (American Personnel & Guidance Association)
___APA (American Psychological Association)
___AECT (Association of Educational & Communications
         Technology)
___AIAA (American Industrial Arts Association)
___AVERA (American Vocational Educational Research
          Association)
___PDK (Phi Delta Kappa)
___Other:_____
___Other:_____

13. Major area of specialty for highest degree
(check only one)
___Education/Teaching
___Education/Administration
___Education/Research
___Education/Curriculum
___Guidance/Counseling
___Vocational Education
___Statistics/Measurement/Tests
___Psychology
___Sociology
___Engineering
___Computer Sciences
___English/Writing
___Humanities
___Business Administration
___Physical Sciences
___Biological Sciences
___Industrial Relations
___Other_____

14. Minor areas of specialty for highest
degree (check areas applicable)
___Education/Teaching
___Education/Administration
___Education/Research
___Education/Curriculum
___Guidance/Counseling
___Vocational Education
___Statistics/Measurement/Tests
___Psychology
___Sociology
___Engineering
___Computer Sciences
___English/Writing
___Humanities
___Business Administration
___Physical Sciences
___Biological Sciences
___Industrial Relations
___Other_____

4

15. Number of years of experience in each of the following areas:
____Administration   ____Conducting RDDE activities   ____Present position
____Teaching   ____Consultation
____Other educational employment _____ _____
____Other employment (non-professional education)_____

YOUR PRESENT JOB

Please classify your present job according to its major emphasis. (e.g. Research IN Non-vocational education--curriculum) Use only one classification in each column. Use the definitions of RDDE provided on page 2 to help classify your job.

16. Type of Job Function: IN 17. The Field of:

____Research (R)   ____Vocational Education
____Development (D)   ____Non-vocational education
____Diffusion (D)   Specify area_____
____Evaluation (E)   ____Part Vocational and part Non-
____Teaching/Training   vocational
____Administration/Management
____Other_____
____Combination of above_____

---

18. Please list the percentage of your time spent in each of the activities listed below. Use the definitions of RDDE provided on page 2 to help you. List the time according to the following scale of %time spent: 0=0%; 1=1-10%; 2=11-20%; 3=21-30%; 4=31-40%; 5=41-50%; 6=51-60%; 7=61-70%; 8=71-80%; 9=81-90%; 10=91- +%.

____Research   ____Development   ____Diffusion

____Evaluation   ____Administration/management

____Teaching/Training ____Other_____
                            (e.g. consulting)

---

19. Please check one of the following which best classifies your place of employment.

___University or College   ___School District (K-12)

___Junior or Community College   ___Research Coordinating Unit

___Technical Institute   ___Federal Agency

___R & D Center   ___Industry

___Independent Research Agency   ___Professional Education Association

___State Education Department   ___Other_____

___Regional Lab

20. Consider each of the following statements which may describe or characterize tasks
    which you may perform in your work. As you consider each task: 1) consider whether
    the task applies to your work. If the answer is NO, mark a "0" in front of that task:
    2) if the task does apply to your work, decide how significant a part of your work it
    represents. Consider and weigh its criticalness, frequency of occurrence, relevance,
    or any other factor which you think determines the extent to which that task is
    performed in your work.

    You are to allot a value between 0 and 5 to each task according to the following
    scale:

            0. Definitely not a part of my work, does not apply.
            1. Under unusual circumstances may be a minor part of my work.
            2.
            3. A significant part of my work.
            4.
            5. A most significant part of my work.

A. Reading.

_____1. Reading recent project-related research.
_____2. Reading scholarly essays.
_____3. Reading methodological documents presenting information regarding methods of
          inquiry and/or analysis.
_____4. Reading "in-house" materials and correspondence.
_____5. Editing and/or proofing of printed materials.
_____6. Other reading:_____

_____

B. Designing or planning procedural activities.

_____1. Identifying relevant variables for consideration.
_____2. Developing conceptual frameworks or general patterns of design.
_____3. Developing methodologies to be used in projects.
_____4. Organizing a coherent program of activities.
_____5. Designating sampling procedures.
_____6. Designating general statistical treatment to be used.
_____7. Designing system models for computer application to data.
_____8. Formulating hypotheses or questions to be answered by research.
_____9. Determining constraints to problem solution, such as time, money, personnel,
          and market factors.
_____10. Developing budgets for tasks or projects.
_____11. Planning and/or making arrangements for field tests, training, trial centers,
          demonstrations, installations, etc.
_____12. Planning of behavioral, attitudinal, and/or learning change in some target
          group.
_____13. Other designing:_____

_____

C. Developing research tools or other information-gathering instruments.

_____1. Constructing questionnaires.
_____2. Developing test items.
_____3. Developing interview outlines and schedules.
_____4. Developing observational techniques.
_____5. Identifying appropriate measures for events, variables, or other measurement
          concerns.
_____6. Fabricating of physical items, such as response recorders, stimulus presen-
          tation devices, room partitions or furniture, prototype devices, etc.
_____7. Other instrument developments:_____

6

D. Collecting project data.

_____1. Interviewing.
_____2. Surveying literature.
_____3. Conducting laboratory experiments.
_____4. Administering questionnaires.
_____5. Administering tests.
_____6. Performing aspects of job and/or task analysis.
_____7. Deriving or otherwise verifying the merit and/or relevance of student per-
        formance objectives (behavioral objectives).
_____8. Collecting and organizing information relevant to the preparation of a
        public information, dissemination, product distribution, or marketing plan.
_____9. Other data collection:_____

_____

E. Analyzing and interpreting data.

_____1. Preparing or using frequency tallies and/or marginal distributions (as in
        Chi-Square tests).
_____2. Computing or using measures of central tendency (i.e., means, medians, modes,
        arithmetic average).
_____3. Computing or using correlation coefficients, including simple correlational
        analyses.
_____4. Computing and interpreting simple tests of significance of differences in
        observed data (such a t-tests).
_____5. Computing and interpreting data from analysis of variance designs.
_____6. Computing and interpreting regression analyses.
_____7. Examining and interpreting non-quantified information (such as verbal
        responses, observed activities, etc.).
_____8. Computing item analyses of test items.
_____9. Drawing implications from the results of prior research (interpret, eval-
        uate, and synthesize the relevant literature).
____10. Analyzing the nature of various audiences of "publics" to prepare appro-
        priate communications.
____11. Other data analysis:_____

_____

F. Writing.

_____1. Writing correspondence.
_____2. Writing research proposals.
_____3. Writing major project reports.
_____4. Writing interim, status, or periodic reports.
_____5. Writing for professional publications.
_____6. Writing administrative reports.
_____7. Writing literature surveys.
_____8. Writing of computer programs for data handling or analysis.
_____9. Writing of programmed instruction outlines and/or frames.
____10. Writing of detailed lesson plans.
____11. Other writing:_____

_____

G. Supervising and coordinating actions of others, and/or of material resources.

_____ 1. Procuring, selecting, and assigning project personnel.
_____ 2. Establishing contact with and participation by other personnel or agencies.
_____ 3. Reviewing performance of project personnel.
_____ 4. Communicating personnel evaluations to individuals.
_____ 5. Scheduling project activities and/or using PERT scheduling.
_____ 6. Allocating responsibilities to project personnel.
_____ 7. Other supervision:_____ _____ _____

_____

H. Teaching or training.

_____ 1. Participating in classroom instruction.
_____ 2. Participating in conduct of seminars or workshops.
_____ 3. Providing on-the-job training to individuals.
_____ 4. Designing appropriate learning situations.
_____ 5. Conducting demonstrations of development products before various groups,
         and answering questions asked by members of the group.
_____ 6. Preparing visual materials, such as films, slides, video tapes, visual
         teaching aids, etc.
_____ 7. Other instruction-related activities:_____

_____

I. Meeting, consulting, or advising.

_____ 1. Contacts with funding sponsor or monitor of project.
_____ 2. Contact with higher agency management for review of project.
_____ 3. Presentations made at professional meetings to communicate various as-
         pects of project activities or results.
_____ 4. Meeting with visiting personnel from other agencies.
_____ 5. Conferring with colleagues, staff, and/or students.
_____ 6. Interacting directly with personnel of other agencies, such as for field
         tests, at trial learning centers, potential users of R & D products, etc.
_____ 7. Speaking before public groups or specific target audiences.
_____ 8. Other participation in meetings:_____

_____

J. Other general category of work:_____

_____

         (specify and rate each specific activity you do)

_____ 1. _____

_____ 2. _____

_____ 3. _____

_____ 4. _____

s

21. Consider each of the following statements which may describe knowledges/skills which you use in your work. As you consider each statement: 1) consider whether the knowledges/skills apply to you and your work. If the answer is NO, mark a "0" in front of that statement; 2) if the knowledges/skills do apply to you and your work, decide the extent to which you are familiar with them.

    You are to allot a value between 0 and 4 to each knowledges/skills statement according to the following scale:

>   0. Does not apply.
>   1. Reading knowledge of, little skill.
>   2. Somewhat less than average skill.
>   3. Somewhat more than average skill.
>   4. Highly skilled.

RESEARCH SKILLS

____1. Drawing research implications from results of prior research studies.

____2. Identifying and delimeating significant researchable problems.

____3. Procuring and/or managing resources (material and human) necessary to reach research objectives.

____4. Interpreting, evaluating, and synthesizing relevant literature.

____5. Formulating hypotheses or empirical questions to be answered by the hypothesis.

____6. Specifying data or evidence necessary for a rigorous test of the hypothesis.

____7. Identifying the population to which results should be generalized and a sample representative of that population, using appropriate sampling techniques to draw the sample.

____8. Formulating alternative generalizations from predicted research outcomes.

____9. Identifying appropriate research methods.

____10. Understanding experimental, quasi-experimental, and other systematic approaches to inquiry, and drawing on such knowledge in designing a research study appropriate to the problem under consideration.

____11. Applying the research design, recognizing, explicating and controlling threats to validity.

____12. Identifying classes of behavioral outcomes for measurement.

____13. Choosing specific variables and treatments (where appro 'iate) to be used.

____14. Selecting appropriate techniques of measurement.

____15. Developing measuring instruments.

____16. Assessing the validity of outcome measures.

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Refer to page 8 for rating scale.

____17. Using a variety of data-gathering methods (tests, interviews, analysis of documents, etc.).

____18. Organizing data for analysis.

____19. Understanding the general role, types, and assumptions underlying various statistical techniques, and drawing on such knowledge in selecting and using appropriate techniques of data analysis.

____20. Using aids in data analyses, such as computer processing.

____21. Interpreting and drawing appropriate conclusions and implications from data analyses.

____22. Formulating statements of a theory that offers an explanation (cause-effect relationship) of the behavior under study.

____23. Reporting research findings and implications, orally and in writing.

____24. Other:_____

RESEARCH/BASED DEVELOPMENT SKILLS
(Including Product Testing)

____1. Interpreting information concerning education goals.

____2. Drawing on research results in planning developmental activities.

____3. Conceptualizing systems, their elements, and interrelations among these elements.

____4. Specifying desired performance outcomes (objectives) of instruction.

____5. Devising techniques to identify entry capabilities of learners.

____6. Describing the product to be developed.

____7. Determining appropriate sequences of topics in instruction.

____8. Describing the product to be developed.

____9. Composing effective oral and written forms of instructional communications.

____10. Directing the work of production personnel.

____11. Selecting or devising appropriate techniques for measuring outcomes.

____12. Designing and managing initial laboratory tests of developed techniques and materials.

____13. Designing and managing field tryouts and tests.

____14. Reporting evaluation of outcomes.

____15. Interpreting evaluation findings.

10

Refer to page 8 for rating scale.

___ 16 Specifying requirements for revision based upon outcome evaluations.

___ ___17. Other:_____

DIFFUSION SKILLS

Dissemination

___ 1. Defining and analyzing characteristics of target group(s).

___ 2. Selecting from all available information about developed packages that which can be most effectively disseminated.

___ 3. Selecting the most effective dissemination vehicles to convey information to target groups.

___ 4. Composing the information, within a chosen format, for accurate and pervasive dissemination.

___ ɔ. Implementing actual dissemination, including the direction of technical production personnel.

___ 6. Designing and implementing techniques for evaluating the effectiveness of the dissemination effort.

___ ___ 7. Other:_____

Demonstration

___ 1. Specifying nature of the demonstration.

___ ___ 2. Selecting appropriate setting and personnel for demonstration.

___ 3. Managing and coordinating the demonstration effort.

___ 4 Evaluating the effectiveness of the demonstration

___ 5. Other: _____

Facilitating Adoption

___ 1. Identifying features of the adopting organization or system which differ from those in which the product was developed and tested.

___ 2 Designing modifications of the product to fit the adopting organization or system, when necessary.

___ 3 Designing prodedures for modifying the adopting system or organization to fit the product, when necessary, including the design of needed training programs

___ ___ 4 Identifying potential barriers to implementation.

___ ___ 5. Devising and conducting long-range evaluation of the installed package.

Refer to page 8 for rating scale.

_____ 6. Other:_____

CONTEXT EVALUATION/SITUATION ANALYSIS SKILLS

_____ 1. Identifying goals of the system.

_____ 2. Assessing the social relevance of those goals.

_____ 3. Identifying values that are implicit in the system goals.

_____ 4. Identifying the nature of the standards or norms the decision-makers will apply in interpreting the relevant data which may be provided.

_____ 5. Clarifying and explicating desired outcomes of the system.

_____ 6. Measuring current actual outcomes of the system through techniques such as:

        (1) demographic analysis
        (2) economic analysis
        (3) psychometric analysis
        (4) systems analysis
        (5) observational techniques

_____ 7. Comparing actual and intended system outcomes to identify discrepancies (needs) which exist in the system.

_____ 8. Explicating the problems that create the needs and diagnosing the causes of these problems.

_____ 9. Helping system personnel to develop objectives which, if attained, will satisfy the needs or solve the problems identified above.

_____10. Designing a monitoring system that will provide continual data (of the type above) on the status of the operating system.

_____11. Other:_____

PROCESS EVALUATION/PROGRAM MONITORING SKILLS

_____ 1. Designing and selecting indicators of progress in educational programs.

_____ 2. Monitoring the program to detect deviations from design or specified procedures through techniques such as unobtrusive measures, systems analysis, and observational techniques.

_____ 3. Anticipating predicted barriers and remaining alert to unanticipated problems that threaten the success of the program.

_____ 4. Providing immediate feedback to program operators for their possible use in making decisions about modifications of the plan, procedures, or resource allocations.

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Refer to page 8 for rating scale.

_____ 5. Perceiving human relation problems that threaten the success of the program.

_____ 6. Other:_____

PROGRAM PLANNING/INPUT ANALYSIS SKILLS

_____ 1. Helping system personnel to apply criteria to lists of possible objectives in order to select those which are feasible within constraints of the operating context.

_____ 2. Helping system personnel to establish priorities for the selected objectives.

_____ 3. Identifying and ting alternative strategies for attaining the selected objectives.

_____ 4. Identitying and rating available resources (human, material, and financial) and/or potential sources of support.

_____ 5. Selecting a strategy for implementation.

_____ 6. Selec . a source of support or the available resources which will be used to implement the program.

_____ 7. Predicting the potential barriers to success in th? proposed course of action and judging the potential of the strategy for overcoming the eatimated procedural barriers.

_____ 8. Identifying alternative tactics to implement selected strategy and choosing those that seem moat likely to succeed.

_____ 9. Other:_____

13

OUTCOME EVALUATION SKILLS

____ 1. Applying appropriate designs to evaluation studies.

____ 2. Developing general criteria and designing data collection proce-
        dures for application in measuring the effectiveness and efficiency
        of existing innovative practices and products, i.e., minimum stan-
        dards and outcomes which indicate successful utilization of practices
        and products.

____ 3. If necessary, translating objectives into behavioral terms.

____ 4. Identifying situations in which the designated behavior can be
        observed and recorded.

____ 5. Establishing standards or norms for judging whether objectives have
        been attained.

____ 6. Selecting (or developing) and using techniques of measurement to
        yield information relevant to these standards.

____ 7. Assessing the validity of outcome measures.

____ 8. Collecting and organizing the data preparatory to analysis.

____ 9. Selecting an appropriate technique to analyze the data.

____10. Analyzing the evidence yielded by the evaluation.

____11. Judging the strengths and weaknesses of the plans and procedures
        employed for meeting the project objectives.

____12. Deciding how to explain the outcome as a function of plans, pro-
        cedures, and resources.

____13. Deciding what recommendations to make as a result of the outcomes.

____14. Estimating the potential impact of the outcomes on the problem.

____15. Providing sufficient information to the decision-maker to enable
        him to decide whether to continue, modify, or terminate the activ-
        ity or process evaluated.

____16. Specifying changes that need to be made in the context evaluation
        system due to decisions about program continuation.

____17. Other:_____

14

YOUR JOB PRODUCTS AND SERVICES

22. Please check the different types of job outcomes (products and services) which you produce and provide for others as a result of your work.

____Newsletters   ____Consultation
____Reports   ____Survey design/conducting
____Bibliographies   ____Proposal review/writing
____Books   ____Workshops/conferences
____Curriculum materials   ____Other_____
____Methodologies (training, analysis, etc.)   ____Other_____
____Tests   ____Other_____
____Proposals
____Training packages
____Other_____

IN-SERVICE TRAINING

23. Please check those items which reflect your perceived in-service training needs. Specify topical area(s) if necessary.

____Statistics_____
____Research design_____
____Survey methodology_____
____Measurement/testing_____
____Writing techniques_____
____Teaching/training techniques_____
____Administration_____
____Program planning-budgeting_____
____Computers/programming_____
____Other_____
____Other_____

24. Have you participated in any in-service training programs in the past year?

____Yes   ____No   If YES, what was the topical area____ _____

DEFINITIONS

25. Please indicate the degree to which you agree with the definitions used in this study on page 2. Circle one number for each definition.

	Disagree Strongly	Disagree	Undecided	Agree	Agree Strongly
Educational RDDE	1	2	3	4	5
Educational Research	1	2	3	4	5
Educational Development	1	2	3	4	5
Educational Diffusion	1	2	3	4	5
Educational Evaluation	1	2	3	4	5
Vocational Education	1	2	3	4	5
Manpower	1	2	3	4	5

COMMENTS AND EXPLANATIONS

26. Please make any desired or necessary comments or explanations about the questionnaire or specific items.

Please use additional sheets if necessary.

OTHERS CONDUCTING RDDE ACTIVITIES

27. Please list the names and addresses of those people in your immediate geographic vicinity who you know are spending 25% or more time on RDDE activities.

NAME	ADDRESS

Please use additional sheets if necessary.

APPENDIX C

First Follow-Up Postcard Reminder

Dear Colleague: January 14, 1972
     In early December you received a questionnaire from
PROJECT STATUS designed to collect information describing
the job roles, tasks, skills, etc. of persons conducting
research, development, diffusion, and evaluation (RDDE)
activities in vocational and non-vocational education fields.

     Although the questionnaire does take about 45 minutes of
your valuable time to complete, the data you can provide is
very important! Basic data like that requested on the
questionnaire is necessary for properly designed pre-service
and in-service training programs for educational RDDE
personnel.

     Would you, therefore, please fill out the questionnaire
sent to you and return it to me. If you do not wish to
participate, please return the questionnaire with a note
indicating that and your name and address on page 3 of the
questionnaire.

     Your assistance in collecting the data is greatly
appreciated.

     Sincerely,
                                    145 Peik Hall, U of M
     Paul E. Schroeder   Minneapolis, MN 55455

APPENDIX D

Second Follow-Up Survey Questionnaire-Short Form

D-1 Cover Letter
D-2 Questionnaire

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UNIVERSITY OF *Minnesota*

RESEARCH COORDINATING UNIT FOR VOCATIONAL EDUCATION
145 PEIK HALL · MINNEAPOLIS, MINNESOTA 55455
PROJECT STATUS (612) 376-7430

February 11, 1972

Dear Colleague:

In December, 1971 or January, 1972 you received a survey questionnaire entitled <u>Roles, Tasks, Training, Skills, Knowledges, Products, and In-Service Training Needs Inventory</u>. That questionnaire is part of a study to locate, collect descriptive data about, and compare personnel conducting <u>r</u>esearch, <u>d</u>evelopment, <u>d</u>iffusion, and <u>e</u>valuation (RDDE) activities in both vocational and non-vocational education fields.

It is important that this data be collected in order that an accurate current status report on educational RDDE personnel be made and available for designing and conducting pre-service and in-service training programs for RDDE personnel.

In order that the study collect data from as many persons as possible who have been identified as RDDE personnel, I have enclosed a shortened version of the original questionnaire sent to you. This version takes about thirty (30) minutes to complete. I would appreciate your participating in the study by completing the questionnaire and returning it to me in the enclosed stamped, addressed envelope. If you do not wish to participate in the study, however, please return the questionnaire with a note indicating that and your name and address on page 3 of the questionnaire.

I will be happy to send you a summary of the results of the survey if you wish one; just check the box in the lower right corner of page 1. If you have any questions or comments concerning the study, please note them on the questionnaire "comments" page or contact me.

Thank you very much for your time and cooperation. Your assistance in collecting the data is greatly appreciated.

Sincerely,

Paul E. Schroeder

Paul E. Schroeder
Project Director

PES/kw

Enclosures

Check Box if you spend less than 25%
time on RDDE activities, then answer
questions 1 through 10 on page 3, and
item 27 on page 9.

Roles, Tasks, Training, Skills, Knowledges, Products, and

In-Service Training Needs Inventory

Instructions

The purpose of this inventory is to gather information about the actual back-
grounds and opinions of professional persons who perform Research, Development,
Diffusion, and Evaluation (RDDE) activities in both vocational and non-vocational
education fields.

Please respond as candidly as possible. Your responses will be kept confiden-
tial and the compilations made from these inventories will be reported in statistical
form only.

There are no right or wrong responses and no preferred pattern of response.

Mark your responses and comments clearly and legibly and make any supplementary
notations regarding pertinent information in the margins, the writing spaces provided
for "other" responses, or on the "comments" page.

If you 1) have spent an average of 25% or more time in each of the past two years,
or 2) are now spending 25% or more time on RDDE activities, please fill out the entire
questionnaire. If you do not fall into either of the above categories please check
the box in the upper left corner of this page, answer questions 1 through 10 on page
3, and item 27 on page 9.

Thank you.

Check Box if you wish a summary
of the results of the survey.

2

<div style="border:1px solid">

DEFINITIONS USED IN THIS STUDY

Educational RDDE: A coordinated set of strategies which produce recognizable products that can be judged as to their quality and their contribution to the solution of an educational problem.

Educational Research: A coordinated set of activities which produce reliable knowledge, that is, facts, principles, generalizations, theories, and laws that can stand the test of empirical verification.

Educational Development: A coordinated set of activities which produce reliable technology, that is, procedures, materials, hardware and organizational frameworks that have a known degree of success in bringing about a particular outcome or in performing a defined operation.

Educational Diffusion: A coordinated set of activities which lead to the adoption and/or utilization of generalizable knowledge, reliable technology and trustworthy information.

Educational Evaluation: A coordinated set of activities which produce trustworthy information in support of decision making, that is, observations, reports, and data derived through formal or informal measures which are presented to decision makers in a form and within a time which permits its utilization in the decision making process.

Vocational Education: Training, retraining, or upgrading which is given in schools, classes, or other locations (factories, store front centers, etc.), including field or laboratory work and remedial or related academic and technical instruction incident thereto, under public or private (trade schools, union programs, business and industry programs, etc.) supervision and control or under contract with a state or local education agency, and is conducted as part of a program designed to prepare or upgrade individuals for gainful employment as semiskilled or skilled workers or technicians or sub-professionals in recognized occupations and in new and emerging occupations, or to prepare individuals for enrollment in advanced technical education programs, but excluding any programs to prepare individuals for employment in occupations generally considered professional or which require a baccalaureate or higher degree.

Manpower: Referring to or dealing with the persons (their characteristics, educational and training background, and socio-economic status) available for the production, management, professional, and service functions of an economy.

</div>

PERSONAL BACKGROUND SECTION   3

INSTRUCTIONS· Check the line✓opposite each item that applies to vou, or write in the
            data required.

1. Name_____
            Last   First   Middle Initial

2. Position or Title_____

3. Business Address_____

4. Institution Name_____

5. City_____ 6. State_____ 7. Zip Code_____

8. Telephone_____ 9. Sex:__Male__Female   10. Age_____

---

11. Check the degrees you hold
___Doctorate
___Specialist of Professional
___Masters
___Bachelors
___Associate
___Technical License
___None of these
___Other:_____

12. National Professional Organization Memberships
___AERA (American Educational Research Association)
___NEA (National Education Association)
___AVA (American Vocational Association)
___APGA (American Personnel & Guidance Association)
___APA (American Psychological Association)
___AECT (Association of Educational & Communications
        Technology)
___AIAA (American Industrial Arts Association)
___AVERA (American Vocational Educational Research
        Association)
___PDK (Phi Delta Kappa)
___Other:_____
___Other:_____

---

13. Major area of specialty for highest degree
    (check only one)
___Education/Teaching
___Education/Administration
___Education/Research
___Education/Curriculum
___Guidance/Counseling
___Vocational Education
___Statistics/Measurement/Tests
___Psychology
___Sociology
___Engineering
___Computer Sciences
___English/Writing
___Humanities
___Business Administration
___Physical Sciences
___Biological Sciences
___Industrial Relations
___Other_____

14. Minor areas of specialty for highest
    degree (check areas applicable)
___Education/Teaching
___Education/Administration
___Education/Research
___Education/Curriculum
___Guidance/Counseling
___Vocational Education
___Statistics/Measurement/Tests
___Psychology
___Sociology
___Engineering
___Computer Sciences
___English/Writing
___Humanities
___Business Administration
___Physical Sciences
___Biological Sciences
___Industrial Relations
___Other_____

4

15. Number of years of experience in each of the following areas:
___Administration   ___Conducting RDDE activities   ___Present position
___Teaching   ___Consultation
___Other educational employment _____   _____
___Other employment (non-professional education)_____

YOUR PRESENT JOB

Please classify your present job according to its major emphasis. (e.g. Research IN Non-vocational education--curriculum) Use only one classification in each column. Use the definitions of RDDE provided on page 2 to help classify your job.

16. Type of Job Function: IN 17. The Field of:

___Research (R)   ___Vocational Education
___Development (D)   ___Non-vocational education
___Diffusion (D)   Specify area_____
___Evaluation (E)   ___Part Vocational and part Non-
___Teaching/Training   vocational
___Administration/Management
___Other_____
___Combination of above_____
_____

18. Please list the percentage of your time spent in each of the activities listed below. Use the definitions of RDDE provided on page 2 to help you. List the time according to the following scale of %time spent: 0=0%; 1=1-10%; 2=11-20%; 3=21-30%; 4=31-40%; 5=41-50%; 6=51-60%; 7=61-70%; 8=71-80%; 9=81-90%; 10=91- +%.

_____Research   _____Development   _____Diffusion

_____Evaluation   _____Administration/management

_____Teaching/Training _____Other_____
                              (e.g. consulting)

19. Please check one of the following which best classifies your place of employment.

___University or College   ___School District (K-12)

___Junior or Community College   ___Research Coordinating Unit

___Technical Institute   ___Federal Agency

___R & D Center   ___Industry

___Independent Research Agency   ___Professional Education Association

___State Education Department   ___Other_____

___Regional Lab

JOB TASKS   5

20. Consider each of the following statements which may describe or characterize task.
    which you may perform in your work. As you consider each task: 1) consider whether
    the task applies to your work. If the answer is NO, mark a "0" in front of that task;
    2) if the task does apply to your work, decide how significant a part of your work
    it represents. Consider and weigh its criticalness, frequency of occurrence,
    relevance, or any other factor which you think determines the extent to which you
    perform that task in your work.
        You are to allot a value between 0 and 5 to each task according to the
    following scale:

                        0. Definitely not a part of my work, does not apply.
                        1. Under unusual circumstances may be a minor part of my work.
                        2.
                   .   ·3. A significant part of my work.
                        4.
                        5. A most significant part of my work.

    _____ A. Reading

    _____ B. Designing or planning procedural activities.

    _____ C. Developing research tools or other information-gathering instruments.

    _____ D. Collecting project data.

    _____ E. Analyzing and interpreting data.

    _____ F. Writing.

    _____ G. Supervising and coordinating actions of other persons, and/or of
              material resources.

    _____ H. Teaching or training.

    _____ I. Meeting, consulting, or advising.

    _____ J. Other general category of work:_____

              _____

    _____ K. Other general category of work:_____

              _____

6   KNOWLEDGES/SKILLS

21. Consider each of the following statements which may describe knowledges/skills which
     you use in your work. As you consider each statement: 1) consider whether the
     knowledges/skills apply to you and your work. If the answer is NO, mark a "0" in
     front of that statement; 2) if the knowledges/skills do apply to you and your work,
     decide the extent to which you are familiar/skilled with them.
          You are to allot a value between 0 and 4 to each knowledges/skills statement
     according to the following scale:

                    0. Does not apply.
                    1. Reading knowledge of, little skill.
                    2. Somewhat less than average skill.
                    3. Somewhat more than average skill.
                    4. Highly skilled.

____ 1. Identifying and delineating significant researchable problems.
____ 2. Procuring and/or managing resources (material and human) necessary to reach
         research objectives.
____ 3. Interpreting, evaluating, and synthesizing relevant literature, and drawing on
         research results in planning developmental activities.
____ 4. Formulating research-directing hypotheses or questions to be answered by a study.
____ 5. Identifying the population to which results should be generalized and a sample
         representative of that population, and using appropriate sampling techniques
         to draw a sample.
____ 6. Identifying appropriate research methods, choosing a research design appropriate
         to the problem under consideration, and applying the research design,
         recognizing and controlling threats to validity.
____ 7. Choosing specific variables and treatments (where appropriate) to be used.
____ 8. Identifying, selecting, and using appropriate statistical techniques in
         analyzing data, and interpreting and drawing appropriate conclusions and
         implications from data analyses.
____ 9. Using aids in data analyses, such as computer processing.
____ 10. Formulating generalizations or statements of a theory that offers an explanation
         (cause-effect relationship) of the behavior under study.
____ 11. Reporting research findings and implications, orally, graphically, and in
         writing.
____ 12. Developing instructional systems, their elements, and interrelations among
         these elements.
____ 13. Specifying desired performance outcomes (objectives), and establishing
         standards or norms in judging whether objectives have been attained.
____ 14. Choosing appropriate instructional and media techniques in developing
         educational products and/or processes.
____ 15. Determining appropriate sequences of topics in instruction.
____ 16. Developing products based on effective oral and written forms of instructional
         communications.
____ 17. Designing and managing field tryouts and tests.
____ 18. Reporting evaluation of outcomes and specifying requirements for revision based
         upon outcome evaluation.
____ 19. Defining and analyzing characteristics of dissemination target group(s).
____ 20. Selecting, from all available information about developed packages, that which
         can be most effective disseminated.
____ 21. Composing information, within chosen format, for accurate and pervasive
         dissemination.
____ 22. Selecting the most effective dissemination vehicles to convey information to
         target groups and implementing actual dissemination.

___23. Designing and implementing techniques for evaluating affectiveness of
dissemination, demonstration, and installation of educational products or
techniques.

___24. Selecting appropriate setting and personnel for demonstration, and managing
and coordinating the demonstration affort.

___25. Identifying features of adopting institutions different from those settings
in which product was developed and tested.

___26. Designing modifications of products to fit institutional settings, when
necessary and/or designing procedures for modifying the adopting institutions
to fit , oducts, when necessary, including the design of appropriate
training programs.

___27. Identifying goals of educational systems, assessing the social relevance of
those goals, and identifying values that are implicit in the system goals.

___28. Identifying the nature of standards or norms decision-makers will apply in
interpreting relevant data which may be provided

___29. Comparing actual and intended system outcomes to identify discrepencies
(needs) which exist in the system.

___30. Helping system personnel to (1) develop objectives which, if attained, will
satisfy the needs or solve the problems identified, and (2) establish
priorities among those objectives.

___31. Designing a context monitoring system that will provide continual data on
the status of education systems.

___32. Identifying and rating alternative strategies for attaining the selected
objectives and identifying tactics to implement selected
strategy and choosing those that seem most likely to succeed.

___33. Identifying potential barriers to adoption of educational innovations or
barriers to success in proposed courses of action and judging the
potential of strategies for overcoming these estimated procedural
activities.

___34. Monitoring educational programs to detect: (a)deviations from design or
specified procedures, and (b) unanticipated problems that threaten the
success of the program.

___35. Providing immediate feedback about performance of educational programs
to program operators for their possible use in making decisions about
modifications of the programs, procedures, or resource allocations.

___36. Applying appropriate designs to evaluation studies.

___37. Translating objectives into behavioral terms and identifying situations in
which the designated behavior can be observed and recorded.

___38. Designing and selecting indicators of progress in educational systems.

___39. Identifying and measuring actual outcomes of systems and selecting or
devising appropriate technique for measuring outcomes.

___40. Other_____

___41. Other_____ _____

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8   YOUR JOB PRODUCTS AND SERVICES

22. Please check the different types of job outcomes (products and services) which you
    produce and provide for others as a result of your work.

____Newsletters   ____Consultation
____Reports   ____Survey design/conducting
____Bibliographies   ____Proposal review/writing
____Books   ____Workshops/conferences
____Curriculum materials   ____Other_____
____Methodologies (training, analysis, etc.) ____Other_____
____Tests   ____Other_____
____Proposals
____Training packages
____Other_____

                              IN-SERVICE TRAINING

23. Please check those items which reflect your perceived in-service training needs.
    Specify topical area(s) if necessary.

____Statistics_____
____Research design_____
____Survey methodology_____
____Measurement/testing_____
____Writing techniques_____
____Teaching/training techniques_____
____Administration_____
____Program planning-budgeting_____
____Computers/programming_____
____Other_____
____Other_____

24. Have you participated in any in-service training programs in the past year?

____Yes   ____No   If YES, what was the topical area_____

                              DEFINITIONS

25. Please indicate the degree to which you agree with the definitions used in this
    study on page 2. Circle one number for each definition.

	Disagree Strongly	Disagree	Undecided	Agree	Agree Strongly
Educational RDDE	1	2	3	4	5
Educational Research	1	2	3	4	5
Educational Development	1	2	3	4	5
Educational Diffusion	1	2	3	4	5
Educational Evaluation	1	2	3	4	5
Vocational Education	1	2	3	4	5
Manpower	1	2	3	4	5

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COMMENTS AND EXPLANATIONS

26. Please make any desired or necessary comments · explanations about the questionnaire or specific items.

.lease use additional sheets if necessary.

OTHERS CONDUCTING RDDE ACTIVITIES

27. Please list the names and addresses of those people in your immediate geographic vicinity who you know are spending 25% or more time on RDDE activities.

NAME	ADDRESS

Please use additional sheets if necessary.

APPENDIX E

Third Follow-Up Telephone Interview of

Non-Respondents-Questionnaire

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Call back:_____
date   time

Mr.
Mrs.
"May I speak to Miss_____ ?"
Dr.

(If not in, find out when person will be in, note date and time above set aside, and call back at indicated time.)

"I'm calling for PROJECT STATUS. During the past four months we've requested that you participate in a nation-wide survey of educational research, development, diffusion, and evaluation personnel to gather data describing their roles, tasks, skills, etc.

Since we have not received any reply from you indicating participation in the study, would you answer a few questions to help us describe non-respondents?"

(If YES, continue. If NO, go to X.)

YES NO   1. "Did you receive any of the survey correspondence?"
___ ___   (If NO, go to A. If YES, go to B.)

YES NO   A. "Let me check to see if I have the correct address.
               The address I have is _____.
___ ___   Is that correct?"
               (If NO—"Let me correct your address. What should
                it be?" Go to D.)

YES NO   B. "Did you fill out either of the questionnaires and
               return them?"
               "The long form" (15 pages)
___ ___   "The short form" (9 pages)
               (If either reply is Yes, go to D. If reply is NO, go to C.)

          C. "Would you please tell me why you didn't choose to
               participate in the sruvey?"
               (If YES, record response. If NO, go to X)

               ___ Don't have time
               ___ Didn't see value of survey
               ___ Too long a questionnaire
               ___ Other_____
               (Go to E.)

          D. "Since we didn't receive the questionnaire, would you
               please answer a few questions to describe your work?"
               (If YES, go to E. If NO, go to X.)

YES NO   E. 1. "Do you spend 25% or more time on RDDE activities?"
___ ___

_____ 2. "What type of institution do you work at?"

_____ 3. "What is your highest degree?"

               4. "How would you classify your field of work—
                                              part vocational and
               ___Vocational   ___Non-vocational ___part non-voactional

               5. "What is your primary job function—
               ___Research   __Development   ___Diffusion

               ___Evaluation   ___Teaching   ___Administration

               ___Other   ___Combination_____
                                            specify
               (Go to F.)

YES NO
___ ___   F. "Would you like to receive a summary of the study results?"

YES NO
___ ___   G. "Do you have any questions or comments?"

          X. "Thank you very much for your time and cooperation.
               Good-bye."

Additional comments concerning interview:
     From interviewee:

     From interviewer:

APPENDIX F

Crossreference of Questionnaire Data Items and

Analysis Variables Identification

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Var. No.	General Data Items	Question No's	Page	Data Group
2	Sex (2 categories)	9	3	Sex
3	Age	10	3	Age
4	Doctorate	11	3	Degrees Held
5	Specialist.			
6	Masters			
7	Bachelors			
8	Associate			
9	Technical License			
10	None of these			
11	Other			
12	AERA	12	3	Association
13	NEA			Memberships
14	AVA			
15	APGA			
16	APA			
17	AECT			
18	AIAA			
19	AVERA			
20	PDK			

Var No.	General Data Items	Question No's	Page	Data Group
21	Other	12	3	Association
22	Other			Memberships
23	Majors for Highest Degree (18 categories)	13	3	Majors
24	Education/Teaching	14	3	Minors
25	Education/Administration			
26	Education/Research			
27	Education/Curriculum			
28	Guidance/Counseling			
29	Vocational Education			
30	Statistics, Measurement/Tests			
31	Psychology			
32	Sociology			
33	Engineering			
34	Computer Sciences			
35	English/Writing			
36	Humanities			
37	Business Administration			
38	Physical Sciences			
39	Biological Sciences			

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Var. No.	General Data Items	Question No's	Page	Data Group
40	Industrial Relations	14	3	Minors
41	Other			
42	Administration	15	4	Years Experience
43	Teaching			
44	Other Educational Employment			
45	Other Employment (non-professional education)			
46	RDDE activities			
47	Consultation			
48	Present Position			
49	Type of Job Function (8 categories)	16	4	Job Function
50	Job Field (3 categories)	17	4	Job Field
51	Research	18	4	% Time in Activities
52	Evaluation			
53	Teaching/Training			
54	Development			
55	Administration/Management			
56	Other			
57	Diffusion			
58	Place of Work (13 categories)	19	4	Place of Work

Var. No.	Task Items	Question No's Page		Duty Area (CODAP Cluster ID)
		No's	Page	
59	Reading recent project-related research	20	5	Reading
60	Reading scholarly essays	A1		
61	Reading methodological documents presenting information regarding methods of inquiry and/or analysis			
62	Reading "in-house" materials and correspondence	to		(A)
63	Editing and/or proofing of printed materials			
64	Other	A6		
65	Identifying relevant variables for consideration	20	5	Designing Procedural Activities
66	Developing conceptual frameworks or general patterns of design			
67	Developing methodologies to be used in projects			
68	Organizing a coherent program of activities	B1		
69	Designating sampling procedures			
70	Designating general statistical treatment to be used	to		(B)
71	Designing system models for computer application to data			
72	Formulating hypotheses or questions to be answered by research	B11		
73	Determining constraints to problem solution, such as time, money, personnel, and market factors			
74	Developing budgets for tasks or projects			
75	Planning and/or making arrangements for field tests, training, trial centers, demonstrations, installations, etc.			

Var. No.	Task Items	Question No's Page	Duty Area (CODAP Cluster ID)
76	Planning of behavioral, attitudinal, and/or learning change in some target group	20 5	Designing Procedural Activities
77	Other	B12 to B13	(B)
78	Constructing questionnaires	20 5	Developing Research Tools
79	Developing test items		
80	Developing interview outlines and schedules	C1	
81	Developing observational techniques		
82	Identifying appropriate measures for events, variables, or other measurement conc⌐.⌐s	to	(C)
83	Fabricating of physical items, such as response recorders, stimulus presentation devices, room partitions or furniture, prototype devices, etc.	C7	
84	Other		
85	Interviewing	20 6	Collecting Data
86	Surveying literature	D1	
87	Conducting laboratory experiments	to	(D)
88	Administering questionnaires	D5	
89	Administering tests		

Var. No.	Task Items	Question No's Page	Duty Area (CODAP Cluster ID)
90	Performing aspects of job and/or task analysis	20 6	Collecting Data
91	Deriving or otherwise verifying the merit and/or relevance of student performance objectives (behavioral objectives)	D6	
92	Collecting and organizing information relevant to the preparation of a public information, dissemination, product distribution, or marketing plan	to	(D)
93	Other	D9	
94	Preparing or using frequency tallies and/or marginal distributions (as in Chi-Square tests)	20 6	Analyzing Data
95	Computing or using measures of central tendency (i.e., means, medians, modes, arithmetic average)		
96	Computing or using correlation coefficients, including simple correlational analyses	E94	
97	Computing and interpreting simple tests of significance of differences in observed data (such as t-tests)	to	(E)
98	Computing and interpreting data from analysis of variance designs	E101	
99	Computing and interpreting regression analyses		
100	Examining and interpreting non-quantified information (such as verbal respons~s, observed activities, etc.)		
101	Computing item analyses of test items		

Var. No.	Task Items	Question No's Page	Duty Area (CODAP Cluster ID)
102	Drawing implications from the results of prior research (interpret, evaluate, and synthesize the relevant literature)	20 6	Analyzing Data
103	Analyzing the nature of various audiences of "publics" to prepare appropriate communications	E102 to	(E)
104	Other	E104	
105	Writing correspondence	20 6	Writing
106	Writing research proposals		
107	Writing major project reports		
108	Writing interim, status, or periodic reports	F1	
109	Writing for professional publications		(F)
110	Writing administrative reports		
111	Writing literature surveys		
112	Writing of computer programs for data handling or analysis	to	
113	Writing of programmed instruction outlines and/or frames		
114	Writing of detailed lesson plans		
115	Other	F11	
116	Procuring, selecting, and assigning project personnel	20 7	Supervising People and Resources
117	Establishing contact with and participation by other personnel or agencies	G1 to G3	(G)
118	Reviewing performance of project personnel		

Var. No.	Task Items	Question No's Page	Duty Area (CODAP Cluster ID)
119	Communicating personnel evaluations to individuals	20 7	Supervising People and Resources
120	Scheduling project activities and/or using PERT scheduling	G4	
121	Allocating responsibilities to project personnel	to	
122	Other	⸌⸍	(G)
123	Participating in classroom instruction	20 7	Teaching
124	Participating in conduct of seminars or workshops		
125	Providing on-the-job training to individuals	H1	
126	Designing appropriate learning situations		
127	Conducting demonstrations of development products before various groups, and answering questions asked by members of the group	to	(H)
128	Preparing visual materials, such as films, slides, video tapes, visual teaching aids, etc.	H7	
129	Other		
130	Contacts with funding sponsor or monitor of project	20 7	Meeting, Consulting
131	Contacts with higher agency management for review of project		
132	Presentations made at professional meetings to communicate various aspects of project activities or results	I1	
133	Meeting with visiting personnel from other agencies	to	(I)
134	Conferring with colleagues, staff, and/or students	I5	

Var. No.	Task Items	Question No's Page	Duty Area (CODAP Cluster ID)
135	Interacting directly with personnel of other agencies, such as for field tests, at trail learning centers, potential users of R & D products, etc.	20 7 I6	Meeting Consulting
136	Speaking before public groups or specific target audiences	to	
137	Other	I8	(I)

| | | Question | | Duty Area (CODAP |
Var. No.	Knowledge/Skill Items	No's	Page	Cluster ID)
138	Drawing research implications from results of prior research studies	21	8-9	Research
139	Identifying and delineating significant researchable problems			
140	Procuring and/or managing resources (material and human) necessary to reach research objectives	J1		
141	Interpreting, evaluating, and synthesizing relevant literature			
142	Formulating hypotheses or empirical questions to be answered by the hypothesis	(J)		
143	Specifying data or evidence necessary for a rigorous test of the hypothesis	to		
144	Identifying the population to which results should be generalized and a sample representative of that population, using appropriate sampling techniques to draw the sample			
145	Formulating alternative generalizations from predicted research outcomes	J12		
146	Identifying appropriate research methods			
147	Understanding experimental, quasi-experimental, and other systematic approaches to inquiry, and drawing on such knowledge in designing a research study appropriate to the problem under consideration			
148	Applying the research design, recognizing, explicating and controlling threats to validity			
149	Identifying classes of behavioral outcomes for measurement			

Var. No.	Knowledge/Skill Items	Question No's	Page	Duty Area (CODAP Cluster ID)
150	Choosing specific variables and treatments (where appropriate) to be used	$\underline{21}$	8-9	Research
151	Selecting appropriate techniques of measurement	J13		
152	Developing measuring instruments			(J)
153	Assessing the validity of outcome measures			
154	Using a variety of data-gathering methods (tests, interviews, analysis of documents, etc.)	to		
155	Organizing data for analysis			
156	Understanding the general role, types, and assumptions underlying various statistical techniques, and drawing on such knowledge in selecting and using appropriate techniques of data analysis	J24		
157	Using aids in data analyses, such as computer processing			
158	Interpreting and drawing appropriate conclusions and implications from data analyses			
159	Formulating statements of a theory that offers an explanation (cause-effect relationship) of the behavior under study			
160	Reporting research findings and implications, orally and in writing			
161	Other			

Var. No.	Knowledge/Skill Items	Question No's Page		Duty Area (CODAP Cluster ID)
162	Interpreting information concerning education goals	21	9-10	Development
163	Drawing on research results in planning developmental activities			
164	Conceptualizing systems, their elements, and interrelations among these elements	K1		
165	Specifying desired performance outcomes (objectives) of instruction			
166	Devising techniques to identify entry capabilities of learners			(K)
167	Describing the product to be developed	to		
168	Determining appropriate sequences of topics in instruction			
169	Describing the product to be developed			
170	Composing effective oral and written forms of instructional communications	K15		
171	Directing the work of production personnel			
172	Selecting or devising appropriate techniques for measuring outcomes			
173	Designing and managing initial laboratory tests of developed techniques and materials			
174	Designing and managing field tryouts and tests			
175	Reporting evaluation of outcomes			
176	Interpreting evaluation findings			

Var. No.	Knowledge/Skill Items	Question No's	Page	Duty Area (CODAP Cluster ID)
177	Specifying requirements for revision based upon outcome evaluations	21 K16 K17	9-10	Development (K)
178	Other			
179	Defining and analyzing characteristics of target group(s)	21	10	Dissemination
180	Selecting from all available information about developed packages that which can be most effectively disseminated	L1		
181	Selecting the most effective dissemination vehicles to convey information to target groups			
182	Composing the information, within a chosen format, for accurate and pervasive dissemination	to		(L)
183	Implementing actual dissemination, including the direction of technical production personnel	L7		
184	Designing and implementing techniques for evaluating the effectiveness of the dissemination effort			
185	Other			
186	Specifying nature of the demonstration	21	10	Demonstration
187	Selecting appropriate setting and personnel for demonstration	M1		
188	Managing and coordinating the demonstration effort	t)		
189	Evaluating the effectiveness of the demonstration	M5		(M)
190	Other			

Var. No.	Knowledge/Skill Items	Question No's	Page	Duty Area (CODAP Cluster ID)
191	Identifying features of the adopting organization or system which differ from those in which the product was developed and tested	21	10-11	Facilitating Adoption
192	Designing modifications of the product to fit the adopting organization or system, when necessary	N1 to		(N)
193	Designing procedures for modifying the adopting system or organization to fit the product, when necessary, including the design of needed training programs	N6		
194	Identifying potential barriers to implementation			
195	Devising and conducting long-range evaluation of the installed package			
196	Other			
197	Identifying goals of the system	21	11	Context Evaluation
198	Assessing the social relevance of those goals	01		(O)
199	Identifying values that are implicit in the system goals	to		
200	Identifying the nature of the standards or norms the decision-makers will apply to interpreting the relevant data which may be provided	05		
201	Clarifying and explicating desired outcomes of the system			

Var. No.	Knowledge/Skill Items	Question No's	Page	Duty Area (CODAP Cluster ID)
202	Measuring current actual outcomes of the system through techniques such as: (1) demographic analysis; (2) economic analysis; (3) psychometric analysis; (4) systems analysis; (5) observational techniques	21	11	Context Evaluation
203	Comparing actual and intended system outcomes to identify discrepancies (needs) which exist in the system	06		
204	Explicating the problems that create the needs and diagnosing the causes of these problems	to		(O)
205	Helping system personnel to develop objectives which, if attained, will satisfy the needs or solve the problems identified above	011		
206	Designing a monitoring system that will provide continual data (of the type above) on the status of the operating system			
207	Other			
208	Designing and selecting indicators of progress in educational programs	21	11-12	Process Evaluation
209	Monitoring the program to detect deviations from design or specified procedures through techniques such as unobtrusive measures, systems analysis, and observational techniques	P1		(P)
210	Anticipating predicted barriers and remaining alert to unanticipated problems that threaten the success of the program	to P3		

Var. No.	Knowledge/Skill Items	Question No's	Page	Duty Area (CODAP Cluster ID)
211	Providing immediate feedback to program operators for their possible use in making decisions about modifications of the plan, procedures or resource allocations	21	11-12	Process Evaluation
212	Perceiving human relation problems that threaten the success of the program	P4		(P)
213	Other	to		
		P6		
214	Helping system personnel to apply criteria to lists of possible objectives in order to select those which are feasible within constraints of the operating context	21	12	Program Planning
215	Helping system personnel to establish priorities for the selected objectives	Q1		(Q)
216	Identifying and rating alternative strategies for attaining the selected objectives	to		
217	Identifying and rating available resources (human, material, and financial) and/or potential sources of support	Q7		
218	Selecting a strategy for implementation			
219	Selecting a source of support or the available resources which will be used to implement the program			
220	Predicting the potential barriers to success in the proposed course of action and judging the potential of the strategy for overcoming the estimated procedural barriers			

Var. No.	Knowledge/Skill Items	Question No's	Page	Duty Area (CODAP Cluster ID)
221	Identifying alternative tactics to implement selected strategy and choosing those that seem most likely to succeed	<u>21</u>	12	Program Planning
222	Other	Q8 Q9		(Q)
223	Applying appropriate designs to evaluation studies	<u>21</u>	13	Outcome Evaluation
224	Developing general criteria and designing data collection procedures for application in measuring the effectiveness and efficiency of existing innovative practices and products, i.e., minimum standards and outcomes which indicate successful utilization of practices and products	R1		(R)
225	If necessary, translating objectives into behavioral terms	to		
226	Identifying situations in which the designated behavior can be observed ard recorded			
227	Establishing standards or norms for judging whether objectives have been attained	R10		
228	Selecting (or developing) and using techniques of measurement to yield information relevant to these standards			
229	Assessing the validity of outcome measures			
230	Collecting and organizing the data preparatory to analysis			
231	Selecting an appropriate technique to analyze the data			
232	Analyzing the evidence yielded by the evaluation			

Var. No.	Knowledge/Skill Items	Question No's	Page	Duty Area (CODAP Cluster ID)
233	Judging the strengths and weaknesses of the plans and procedures employed for meeting the project objectives	21	13	Outcome Evaluation
234	Deciding how to explain the outcome as a function of plans, procedures, and resources	R11		
235	Deciding what recommendations to make as a result of the outcomes	to		(R)
236	Estimating the potential impact of the outcomes on the problem			
237	Providing sufficient information to the decision-maker to enable him to decide whether to continue, modify, or terminate the activity or process evaluated	R17		
238	Specifying changes that need to be made in the context evaluation system due to decisions about program continuation			
239	Other			

Var. No.	General Data Items	Question No's	Page	Data Group
240	Newsletters	22	14	Job Products and Services
241	Reports			
242	Bibliographies			
243	Books			
244	Curriculum Materials			
245	Methodologies (training, analysis, etc.)			
246	Tests			
247	Proposals			
248	Training Packages			
249	Other			
250	Consultation			
251	Survey design/conducting			
252	Proposal review/writing			
253	Workshops/conferences			
254	Other			
255	Other			
256	Other			
257	Statistics	23	14	In-Service Training Needs
258	Research design			

Var. No.	General Data Items	Question No's	Page	Data Group
259	Survey methodology	23	14	In-Service Training Needs
260	Measurement testing			
261	Writing techniques			
262	Teaching/training techniques			
263	Administration			
264	Program planning-budgeting			
265	Computers/programming			
266	Other			
267	Other			
268	Participation in in-service training during past year (2 categories)	24	14	In-Service
269	RDDE	25	14	Agreement with Definitions
270	Research			
271	Development			
272	Diffusion			
273	Evaluation (Given on page 2 of questionnaire)			
274	Vocational Education			
275	Manpower			

Var. No.	General Data Items		Question		
			No's	Page	Data Group
276	Comments		26	15	Comments
277	*		27	15	Names

APPENDIX G

Example of SPSS Computer Program Printout

THE STATUS OF VOCATIONAL EDUCATION R. D, D, AND E PERSONNEL

FILE LONG15   (CREATION DATE = 04/17/72)

- - - - - - - - - - - - C R O S S T A B U L A T I O N   O F - - - - - - - - - -
VAR050   BY VAR049   JOB FUNCTION
- PAGE 1 OF 1

VAR049										
COUNT ROW PCT COL PCT TOT PCT	RESEARCH 1	DEVELOP- MENT 2	DIFFUS- ION 3	EVALUAT- ION 4	TEACHING 5	ADMINIS- TRATION 6	OTHER 7	COMBINAT ION 8	ROW TOTAL
VAR050										
VOC-EDUC 1	34 13.4 48.7 6.7	42 14.8 56.0 7.4	17 6.0 70.8 3.0	23 8.1 53.5 4.0	26 9.2 48.1 4.6	30 1.6 45.5 5.3	3 1.1 50.0 .5	104 36.7 46.4 18.2	283 49.5
NON-VOC EDUC 2	17 15.6 21.8 3.0	12 11.0 16.0 2.1	3 2.8 12.5 .6	11 10.1 25.6 1.9	14 12.8 25.9 2.5	15 13.8 22.7 2.6	1 .9 16.7 .2	36 33.0 16.1 6.3	109 19.1
PART-VOC-NON-VOC 3	23 12.9 29.5 4.0	21 11.8 28.0 3.7	4 2.2 16.7 .7	9 5.1 20.9 1.6	14 7.9 25.9 2.5	21 11.8 31.8 3.7	2 1.1 33.3 .4	84 47.2 37.5 14.7	178 31.2
COLUMN TOTAL	74 13.7	75 13.2	24 4.2	43 7.5	54 9.5	66 11.6	6 1.1	224 39.3	570 100.0

RAW CHI SQUARE = 15.41289 WITH   14 DEGREES OF FREEDOM. SIGNIFICANCE = .3505
CRAMERS V = .11628
CONTINGENCY COEFFICIENT = .16226
LAMDA (ASYMMETRIC) = 0.00000 WITH VAR050 DEPENDENT.   = 0.00000 WITH VAR049   DEPENDENT.
LAMDA (SYMMETRIC) = 0.00000
UNCERTAINTY COEFFICIENT (ASYMMETRIC) = .01219 WITH VAR050 DEPENDENT.   = .00772 WITH VAR049   DEPENDENT.
UNCERTAINTY COEFFICIENT (SYMMETRIC) = .00974
KENDALLS TAU B = .06979.   SIGNIFICANCE = .0064
KENDALLS TAU C = .07274.   SIGNIFICANCE = .0047
GAMMA = .10029
SOMERS D (ASYMMETRIC) = .06221 WITH VAR050 DEPENDENT.   = .07829 WITH VAR049   DEPENDENT.
SOMERS D (SYMMETRIC) = .04933

NUMBER OF MISSING OBSERVATIONS = 13

APPENDIX H

Statistical Formulas Used in SPSS Computer Program

Chi-Square (Pearson's Chi-Square test for Association)

$$\chi^2 = \sum_i \frac{(f_o^i - f_e^i)^2}{f_e^i}$$

(r-1)(c-1) degrees of freedom

f_o^i = observed frequency in each cell

f_e^i = expected frequency in each cell

c = number of columns

r = number of rows

f_e^i is calculated by: $f_e^i = \frac{(c_i r_i)}{N}$

c_i = frequency of respective column marginal

r_i = frequency of respective row marginal

N = total number of valid cases

Phi (for 2 x 2 tables)

$$\phi = \frac{\chi^2}{N}$$

Cramer's V (for non 2 x 2 tables)

$$V = \left(\frac{\phi^2}{Min(r-1),(c-1)} \right)^{1/2}$$

Fisher's Exact Test

$$P_i = \frac{R_1!R_2!C_1!C_2!}{N!a!b!c!d!}$$

R_1 = frequency total for row 1

R_2 = frequency total for row 2

C_1 = frequency total for column 1

C_2 = frequency total for column 2

a,b,c,d = frequency of cell a,b,c,d respectively
(assuming cells are lettered according
to the following diagram)

a	b	R_1
c	d	R_2

C_1 C_2

N = total number of valid cases

APPENDIX I

Example of CODAP Computer Program Printout

203

VOCATIONAL EDUCATION RESEARCHERS

OP99127J   VOEDRE 52   PAGE

SPECIAL JOB DESCRIPTIONS BASED ON HISTORY DATA WHICH CLASSIFYS CASES INTO
R-O-D-E-7-A-O-C AND VOC,NON-VOC,PART VOC AND NON-VOC JOB CATEGORIES.

DUTY JOB DESCRIPTION---CASES- 583----TASKS- 101----DUTIES-10----MEMBERS- 30
VOCATIONAL EDUCATION RESEARCHERS
SELECTED FROM THE FOLLOWING COMPUTED/HISTORY VARIABLES:
    VO-2/E9/   1/ :JOB FUNCTION - VARIABLE NO. 16 ON QUESTIONNAIRE - RDRE:ADC
    AND/VO03/EO/   1/ :JOB FIELD - VARIABLE NO. 17 ON QUESTIONNAIRE - VNP

            COUNT OF DUTIES OR TASKS LISTED............
            CUMULATIVE SUM OF AVERAGE PERCENT TIME SPENT BY ALL MEMBERS...
            AVERAGE PERCENT TIME SPENT BY ALL MEMBERS........
    ORDERED BY...AVERAGE PERCENT TIME SPENT BY MEMBERS PERFORMING..........
            PERCENT OF MEMBERS PERFORMING...........

D-TSK	DUTY TITLE				
J	RESEARCH SKILLS-KNOWLEDGES	100.00	17.72	17.72	17.72
R	OUTCOME EVALUATION SKILLS-KNOWLEDGES	84.21	10.90	9.18	26.90
K	RESEARCH-BASED DEVELOPMENT SKILLS-KNOWLEDGES	84.76	9.41	8.82	35.62
B	DESIGNING OR PLANNING PROCEDURAL ACTIVITIES	100.00	8.98	8.98	44.80
F	ANALYZING AND INTERPRETING DATA	92.37	4.61	4.24	51.01
O	CONTENT EVALUATION/SITUATION ANALYSIS SKILLS-KNOWLEDGES	97.37	6.22	6.05	57.10
I	MEETING,CONSULTING, OR ADVISING	84.21	5.96	5.02	62.12
G	PROGRAM PLANNING/INPUT ANALYSIS SKILLS-KNOWLEDGES	100.00	5.30	5.30	67.42
D	COLLECTING PROJECT DATA	76.31	4.87	3.72	71.13
C	DEVELOPING RESEARCH TOOLS - INFORMATION-GATHERING TOOLS	100.00	4.38	4.38	75.51
E	SUPERVISING AND COORDINATING PEOPLE AND/OR RESOURCES	97.37	4.21	4.21	79.72
A	READING	100.00	4.15	4.04	83.76
L	DIFFUSION SKILLS-KNOWLEDGES	86.84	3.64	3.18	87.88
H	FACILITATING ADOPTION SKILLS-KNOWLEDGES	91.94	3.60	2.27	91.03
	TEACHING OR TRAINING	92.10	3.00	2.76	96.06
P	PROCESS EVALUATION/PROGRAM MONITORING SKILLS-KNOWLEDGES	78.94	2.93	2.31	98.37
M	DEMONSTRATION SKILLS-KNOWLEDGES	55.26	2.34	1.29	99.66