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ABSTRACT

This module providing an introduction to research procedures is one of a set of five on evaluation and research and is part of a larger series of thirty-four modules constituting a core curriculum for use in the professional preparation of vocational educators in the areas of agricultural, business, home economics, and industrial education. Following the module objective and overview and a bibliography of suggested resource materials (readings) for the entire module, five lessons are presented: (1) research, a scientific method; (2) elements of a research report; (3) sources and utilization of research literature; (4) analysis of descriptive, experimental, and historical research and (5) data gathering tools of research. Each lesson contains the objective, overview, a list of suggested learning activities, and a list of suggested resources (readings). Concluding the module is a pre/posttest and an answer key. (The modules have been field tested in various educational settings, including bachelor and masters degree programs, and are considered adaptable to many instructional styles and student entry levels. CE 018 935-937 contain working papers and other materials used in the development of the module series.) (JH)

Common Core Curriculum
for Vocational Education

G-3

INTRODUCTION TO RESEARCH PROCEDURES IN VOCATIONAL EDUCATION

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Category G:

EVALUATION AND RESEARCH

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This work was developed under a contract with the California State Department of Education under the provisions of Public Law 90-576, EPDA, Part F. However, the opinions expressed herein do not necessarily reflect the position or policy of the State Department of Education and no official endorsement by the State Department of Education should be inferred.

ABOUT THIS MODULAR CURRICULUM

This module is one of a series of 34 modules intended for use in the professional preparation of vocational educators in the vocational education service areas of agricultural, business, home economics, and industrial education. The curriculum can be adapted to various styles of instruction and to various entry-levels of students.

It is recommended that an instructor planning to use these modules review each category to determine if any modification is needed in the objectives and suggested activities so that they conform with local institutional policies and/or vocational education programs. It is also suggested that resources and activities be identified for the specific entry-level of the student to be served.

The activities listed are suggested. The use of any other activity or reading reference which the instructor believes would help to accomplish the objectives of that lesson is encouraged. The choice of the teacher to use the entire module, either through group reports or individualized assignment, will be related to individual student competency requirements.

Since many modules strongly recommend the use of local administrative personnel and community rsources, it is suggested that all site visitations and requests for assistance in the community be coordinated by or cleared through the instructor. The instructor may wish to distribute these tasks among the student group and across the community with the class report system being used to disseminate the information gathered.

These modules have been field tested in various settings. They have been used with students working toward a bachelor's or master's degree and with students seeking the designated subjects credential in California. Some modules were tested through student independent study, others as part of total class assignment, and still others as an alternate activity. Workshop participants examined the materials in terms of content, activities, and resources. The adaptability of this curriculum is one of its strengths.

The materials could not have been completed without the participation and contribution of many individuals. Chief among these persons were the module writers, workshop participants, field-test instructor, and students. Conference presentors and evaluators also contributed to this project. Proceedings of the workshop are available upon request.

If we can provide you with information or help in using this curriculum, please feel free to contact us.

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INTRODUCTION TO RESEARCH PROCEDURES IN VOCATIONAL EDUCATION

Module Objective

Upon the satisfactory completion of this module, the student preparing to become a teacher of vocational education subjects will be able to:

(1) Analyze and summarize the systematic and intensive process of carrying on scientific educational research.

(2) Develop basic skills in research procedures.

(3) Understand the importance of research to all phases of education, and particularly to vocational education.

Module Overview

The purpose of this module is to acquaint the student preparing to be a teacher of vocational education subjects with research procedures in the behavioral sciences. It is the teacher and administrator who must ultimately become aware of the new ideas and concepts resulting from educational research and incorporate into the teaching-learning process those which have potential.

John L. Hayman, Jr., in his book Research in Education, 1968, indicates that educational research is a part of the behavioral sciences in which the purpose is to understand, explain, predict, and to some degree control human behavior. It is a carefully directed, formal, systematic, and intensive process which is closely tied to theory and to theory development. Ultimately, however, it has a unique and specific purpose; to provide information or knowledge through which education can be made more effective.

The following lessons are included to facilitate an understanding of the objectives of this module:

(1) Research: A Scientific Method

(2) Elements of a Research Report

(3) Sources and Utilization of Research Literature

(4). Analysis of Descriptive, Experimental, and Historical Research

(5) Data Gathering Tools of Research

Resource Materials for Completing the Activities in this Module

Best, John W. Research in Education. Englewood Cliffs, New Jersey: Prentice-Hall, 1970.

Borg, Walter R., and Meredith D. Gall. Educational Research. New York: David McKay Company, 1971.

Brouby, Harry S. Philosophy of Educational Research. New York: John Wiley & Sons, 1973.

Hayman, John L. Research in Education. Columbus, Ohio: Charles E. Merrill, 1968.

Kramer, Edward, and Clyde Morris. Reading and Evaluating Educational Research. New York: Collier Macmillan, 1974.

Millman, Jason, and D. Boy Gowin. Appraising Educational Research: A Case Study Approach. Englewood Cliffs, New Jersey: Prentice-Hall, 1974.

INTRODUCTION TO RESEARCH PROCEDURES IN VOCATIONAL EDUCATION

Lesson One: Research: A Scientific Method

Objective

Upon the satisfactory completion of this lesson, the student will be able to state in writing or present orally scientific methods of research as applied to the behavioral sciences.

Overview

One of the major goals that has existed since the beginning of time is that of gaining a better understanding of the world in which we live. Through a better understanding of our world, it has been possible for the human race to remove much of the drudgery of day to day living. A large measure of the success that has been achieved in the technological development of our society must be attributed to the sophisticated and advanced methods of scientific research.

Research in the behavioral sciences has developed more slowly than that in the physical and biological sciences. Two of the major hurdles in the study of education, psychology, sociology, and the other behavioral sciences have been the lack of adequate measuring tools and the complexity of the phenomena to be measured. Advanced techniques of research in this field of study are still in the development stage.

Research should be thought of as a process of arriving at solutions to problems through planned and systematic collection, analyses, and interpretation of data. Educational research is centered upon systematic studies designed to provide educators with more effective means of attaining worthwhile educational goals. The specific purpose of this lesson is to acquaint you with the scientific process as it applies to research in education.

Suggested Activities

Based on reading the references listed, complete the following activities.

(1) Discuss three approaches through which one can arrive at "truth" concerning his/her environment. Give an example of each as it would apply to research in vocational education.

(2) Describe and differentiate between inductive and deductive reasoning.

(3) In its development, science went through three relatively identifiable stages. Discuss these three stages.

(4) Identify and discuss several aspects of empirical science.

(5) Log your behavior for a day and classify your experiences as to their basis in:

a. authority
b. custom and tradition
c. logical reasoning
d. experimentation

Suggested Resources

Best, John W. Research in Education. Englewood Cliffs, New Jersey: Prentice-Hall, 1970.

Borg, Walter R., and Meredith D. Gall. Educational Research. New York: David McKay Company, 1971.

Broudy, Harry S. Philosophy of Educational Research. New York: John Wiley & Sons, 1973.

Hayman, John L. Research in Education. Columbus, Ohio: Charles E. Merrill, 1968.

Kramer, Edward, and Clyde Morris. Reading and Evaluating Educational Research. New York: Collier Macmillan, 1974.

Mouly, Gerogé J. The Science of Educational Research. New York: Van Nostran Reinhold Company, 1970.

Upon successful completion of assigned activities, proceed to Lesson 2.

INTRODUCTION TO RESEARCH PROCEDURES IN VOCATIONAL EDUCATION

Lesson Two: Elements of a Research Report

Objective

Upon the satisfactory completion of this lesson, the student will be able to (1) identify and describe the elements involved in scientific research procedures in the behavioral sciences and (2) identify and describe these elements as they apply specifically to vocational education.

Overview

As stated in the Overview of Lesson One, educational research is centered upon the systematic studies designed to provide educators with more effective means of attaining worthwhile educational goals.

According to John L. Hayman, in Research in Education, 1968, there are generally three reasons why research in a given area is needed: (1) There is no information at all on some particular aspect of the area; (2) there is incomplete information, so that further investigation suggested by the information at hand is needed, and (3) there is information which appears to be complete and highly useful but which is not well substantiated.

As one engages in a research study, there are some logical procedures to be considered. It is the purpose of this lesson to acquaint you with the major elements of a research report.

Suggested Activities

(1) Prepare a list of the major elements that should be considered in the preparation of a rasearch report.

(2) Discuss the significance of each of the elements of a research report as identified in activity one.

(3) Review two research reports (theses) in your area of study. Discuss the contributions of these studies to education. Identify the elements of a research report as used in these studies.

(4) Identify the element of a research report that is generally most difficult for the graduate student to prepare.

(5) Define and describe the properties of a good hypotehsis and indicate different ways of stating a hypotehsis.

(6) Prepare a list of five topics that you consider to be worthy of a research study in your area of specialization. For one of these topics, write a problem statement.

(7) In a Null Hypothesis Form, prepare three statements regarding some aspect of vocational education.

Suggested Resources

Best, John W. Research in Education. Englewood Cliffs, New Jersey: Prentice-Hall, 1970.

Borg, Walter R., and Meredith D. Gall. Educational Research. New York: David McKay Company, 1971.

Hayman, John L. Research in Education. Columbus, Ohio: Charles E. Merrill, 1968.

Millman, Jason, and D. Boy Gowin. Appraising Educational Research: A Case Study Approach. Englewood Cliffs, New Jersey: Prentice-Hall, 1974.

Mouly, George J. The Science of Education Research. New York: Van Nostran Reinhold Company, 1970.

Upon successful completion of assigned activities, proceed to Lesson 3.

INTRODUCTION TO RESEARCH PROCEDURES IN VOCATIONAL EDUCATION

Lesson Three: Sources and Utilization of Research Literature

Objective

Upon the satisfactory completion of this lesson, the student will be able to (1) present in writing or state orally the significance of a review of the literature to a research study, and (2) to identify and demonstrate the ability to utilize research sources pertaining to education.

Overview

Significant to any research effort is a review of the literature. A review of the literature is necessary to gain information about the same research topic, as well as information about related subject areas. An extensive review of the literature is also essential so the researcher can gain a better perspective of the topic under study, and to more effectively establish the parameters of the study.

In this lesson, the student's goal will be to gain an awareness of the many resources available to facilitate conducting a research project in education.

Suggested Activities

(1) Prepare a bibliography of professional journals in your fields of specialization.

(2) Present a list of several research topics in your field of specialization to your instructor. Prepare a list of reference sources in which you can find information about one of the topics. Cite specific examples of how the topic is noted in several different reference sources.

(3) Discuss the importance of a review of the literature in the selection and support of a research problem.

(4) Describe the difference between primary and secondary sources of literature.

(5) Describe a process of collecting and organizing information from a review of the literature.

(6) Write a brief report on some research in your area of specialization, setting forth:

a. Title of the study
b. Purpose of the study
c. Hypotheses: stated or implied
d. Methodology of study
e. Findings and conclusions of the study
f. Value of the research effort to vocational education or to the total body of knowledge
g. Research design used in treating the data
h. Biases that you feel are inherent in the study

Suggested Resources

Best, John W. Research in Education. Englewood Cliffs, New Jersey: Prentice-Hall, 1970.

Borg, Walter R., and Meredith D. Gall. Educational Research. New York: David McKay Company, 1971.

Hayman, John L. Research in Education. Columbus, Ohio: Charles E. Merrill, 1968.

Mouly, George J. The Science of Educational Research. New York: Van Nostran Reinhold Company, 1970.

Upon successful completion of assigned activities, proceed to Lesson 4.

INTRODUCTION TO RESEARCH PROCEDURES IN VOCATIONAL EDUCATION

Lesson Four: Analysis of Descriptive, Experimental, and Historical Research

Objective

Upon the satisfactory completion of this lesson, the student will be able to describe and differentiate between descriptive, experimental, and historical research.

Overview

Many authors classify research in one of three broad categories: Descriptive, experimental, and historical. These classifications are not completely exclusive of each other and additional classification schemes for research are possible. Each of the three types of research are of value to education. As one conducts research, he or she should have an awareness of the characteristics of the different approaches and how each can add to the total body of knowledge in education.

Suggested Activities

(1) Describe historical research and outline procedures to be observed in this type of research.

(2) Discuss the significance of historical research to the current practices in education.

(3) Descriptive research is the most prevalent of research studies in education. Discuss this type of research and describe methods of obtaining data.

(4) Discuss some of the limitations and advantages of the survey approach in the investigation of educational problems.

(5) Discuss the importance and the characteristics of experimental methods of research.

Suggested Resources

Best, John W. Research in Education. Englewood Cliffs, New Jersey: Prentice-Hall, 1970.

Borg, Walter R., and Meredith D. Gall. Educational Research. New York: David McKay Company, 1971.

Hayman, John L. Research in Education. Columbus, Ohio; Charles E. Merrill, 1968.

Mouly, George J. The Science of Educational Research. New York: Van Nostran Reinhold Company, 1970

Upon successful completion of assigned activities, proceed to Lesson 5.

INTRODUCTION TO RESEARCH PROCEDURES IN VOCATIONAL EDUCATION

Lesson Five: Data Gathering Tools of Research

Objective

Upon the satisfactory completion of this lesson, the student will be able to identify and discuss (1) types of research gathering tools; (2) important qualities of research tools; and (3) appropriate procedures for using data collecting tools of research.

Overview

Instruments that facilitate the collection of data upon which research hypotheses may be tested are referred to as tools of research. To develop a sound research plan, it is important that the researcher select appropriate statistical tools prior to the collection of data. Different statistical tests may require that the data be collected in different forms.

Mouly, in the Science of Educational Research, 1970, stresses the fact that there are two concepts that should be of special concern as one collects data for survey type research studies:

(1) The sample on the basis of which the data are collected must be representative of the population selected for investigation in order for the conclusions drawn to apply to that population.

(2) The validity of the instrument or techniques used in gathering the data is crucial to the validity of the conclusions that are derived from surveys.

Suggested Activities

(1) Identify and discuss the basic purpose of several types of instruments that can be used to gather research data.

(2) Discuss the advantage and disadvantage of the questionnaire to be used.

(3) Review a questionnaire from a master's thesis and evaluate it in terms of the following questions:

a. Does it deal with a significant topic?
b. Does it make an important contribution to research?
c. Is the importance of the problem clearly explained in the cover letter?

d. Does it seek only information not available elsewhere?
e. Is it as brief as the study of the problem will allow?
f. Are directions clear, complete, and acceptable?
g. Are questions relatively free from ambiguity and other invalidating features?
h. Are questions that may place the respondent on the defensive avoided?
i. Are questions arranged so they can be readily tabulated and interpreted?

(4) Discuss the characteristics and applications of the Likert Scale.

Suggested Resources

Best, John W. Research in Education. Englewood Cliffs, New Jersey: Prentice-Hall, 1970.

Borg, Walter R., and Meredith D. Gall. Educational Research. New York: David McKay Company, 1971.

Mouly, George J. The Science of Educational Research. New York: Reinhold Company, 1970.

Upon completion of the assigned activities in this module, you should be ready to take the Module Posttest. See your instructor for directions and measurement criteria.

INTRODUCTION TO RESEARCH PROCEDURES IN VOCATIONAL EDUCATION

MODULE PRE/POSTTEST

Student _____

Instructor _____

Date _____

Student: This pre/posttest is designed to assess your knowledge of research procedures in vocational education. Since this module is an individualized and competency-based learning device, you will need to study only those lessons that are presented on the basis of your response to this test.

1. List the basic steps involved in preparing a scientific research paper.

   a.

   b.

   c.

   d.

   e.

   f.

2. Discuss three approaches through which one can arrive at "truth" regarding his/her environment.

   a.

   b.

   c.

3. Describe inductive, deductive, and inductive-deductive reasoning.

Pre/posttest (continued)

4. Discuss the significance of the statement of the problem in a research proposal.

5. Discuss the purpose of a hypothesis as used in educational research.

6. Discuss the importance of the review of the literature in the selection and support of a research problem.

   a.

   b.

   c.

   d.

   e.

7. Describe the following research resource materials and discuss their importance.

   a. ERIC

   b. Education index

   c. Review of educational research.

8. Identify several professional research resource materials in your area of specialization.

9. Identify and discuss three basic classifications of research.

   a.

   b.

   c.

Pre/posttest (continued)

10. Discuss the limitations of survey type research studies.

11. Identify and discuss several qualities of a good test that can be used for research purposes.

12. List several characteristics of a good questionnaire.

13. Describe the Likert-type scale as it applies to a research instrument.

Return this test to your instructor.

INTRODUCTION TO RESEARCH PROCEDURES IN VOCATIONAL EDUCATION

ANSWER KEY
MODULE PRE/POSTTEST

Instructor: Do not reproduce this page in students' booklets. You must retain it for grading and prescriptive purposes. Answers will vary with individuals. A preferred response might be similar to the answer presented.

1. (L1)
   a. Selecting a problem
   b. Writing a problem statement
   c. Reviewing the literature
   d. Developing appropriate theory
   e. Stating hypotheses and through them stating the precise objectives
   f. Planning the procedures to be followed in conducting the study and selecting:
      (1) the research methodologies to be used
      (2) the data needed and the means by which they may be obtained
      (3) the techniques to be used in analyzing data
      (4) the study sample and the method of selecting it

2. (L1)
   a. Experience: This could be based on one's own experiences or the direct experiences of others.
   b. Reasoning: This process involves observations regarding the why of some phenomenon. On the basis of observations, logical reasons for an event are proposed.
   c. Experimentation: This process generally involves classifying and exercising control over aspects of the phenomenon to be tested.

3. (L1)
   a. Inductive reasoning is the process of drawing generalizations on the basis of specific instances.
   b. Deductive reasoning is the process of drawing specific conclusions based on generalizations.
   c. Deductive-Inductive: The researcher operates inductively from observations to hypotehses, and then deductively from these hypotheses to their implications.

4. (L2) A problem statement describes some type of relationship between two or more variables. The statement of the problem should be clearly stated with only one meaning, and it should be amenable to testing. The statement of the problem should also provide the researcher with a clear and concise idea of his/her research project and it will facilitate planning the other elements required to complete the study.

Pre/posttest Answer Key (continued)

5. (L2) The hypothesis identifies precisely what the researcher would like to find out from the study. In essence, the hypothesis determines what the study is all about.

6. (L3)
a. Defines and delimits the problem
b. Helps establish the merit of the study
c. Avoids duplication of findings that have been well established
d. Provides the researcher with suggestions and insights regarding methodologies of research
e. Identifies ideas for a research study

7. (L3)
a. ERIC: Educational Resources Information Center, U. S. Office of Education. This system transmits the findings of current educational research to teachers, administrators, researchers, and the public. ERIC is valuable to the student engaged in research in gaining an overview of the most current research being done in education. Monthly ERIC publications called Research in Education contain abstracts of research recently completed.
b. Education Index: This document provides an up-to-date listing of articles published in hundreds of education journals, books about education, and publications in related fields.
c. Review of Educational Research: Published five times a year, it summarizes the research literature in twenty-three major topics.

8. (L4)
a. Resource materials specifically related to Business.

Business Education Forum
National Business Education Association
Reston, Virginia

Business Education World
Gregg Division
McGraw-Hill Book Company
New York

California Business Education Journal
CBEA Central Office
Los Altos, CA

The Delta Pi Epsilon Journal
Delta Pi Epsilon National Headquarters
St. Peter, Minnesota

Journal of Business Education
Heldref Publications
Washing[illegible], D.C.

b. Resource Materials in Agriculture.

Horticulture
Published by Horticultural Society
Boston, Massachusetts

Farm Journal
Published by Farm Journal, Inc.
Washington Square
Philadelphia, Pennsylvania

Agriculture Research
U. S. Department of Agriculture
Washington, D.C. 20250

Poultry Digest
Associated Publications
Sea Isle City, New Jersey

Pre/posttest Answer Key (continued)

Western Livestock Journal
Nelson R. Crow Publication
Denver, Colorado

Agricultural Engineering
American Society of Agricultural Engineering
St. Joseph, Michigan

c. Resource Materials in Home Economics.

American Behavioral Scientist
Sage Publications, Inc.
175 South Beverly Drive
Beverly Hills
California
30212

Family Economics Review
Consumer and Food Economics Research Division
Agricultural Research Service
U. S. Department of Agriculture
Federal Center Building
Hyattsville, Maryland 20782

Journal of the American Dietetic Association
430 North Michigan Avenue
Chicago, Illinois 60611

Journal of American Institute of Architects
1735 New York Avenue
Washington, D. C. 10006

The Journal of Consumer Research
222 S. Riverside Plaza
Chicago, Illinois
60606

Journal of Marriage and the Family
Department of Sociology
University of Florida
Gainesville, Florida 32611

d. Resource Materials in Industrial Education,

American Vocational Journal
Published by the American Vocational Association
Washington, D. C.

Industrial Education
Macmillian Professional Magazines
Greenwich
Connecticut

Man/Society/Technology
Published by the American Industrial Arts Association
Washington, D. C.

Journal of Industrial Teacher Education
Published by the National Association of Industrial and Technical Teacher Educators
West Lafayette, Indiana

9. (L4)
a. Historical Research: provides one with a greater understanding of the past, and it also has important implications for present practices in education.
b. Descriptive Research: is designed to determine the present status of a given phenomenon
c. Experimental Research: is probably the most sophisticated of the research methods; its basic purpose is to identify functional relationships among phenomena.

10. (L4)
a. Failure to single out the most significant factor
b. Failure to recognize that events often have multiple rather than single causes
c. Basing conclusions on a too-limited number of occurrences
d. Failure to recognize that factors may go together without having a cause-effect relationship

Pre/posttest Answer Key (continued)

11. (L5)
a. Validity: The test measures what it is supposed to measure.
b. Reliability: The test measures consistently what it is supposed to measure.
c. Objectivity: The test can be scored independently of the personal judgment of the scorer.

12. (L5)
a. It deals with a significant topic and is as short as possible.
b. It seeks only information that is not readily available from other sources.
c. It is attractive in appearance.
d. Directions are clear and complete.
e. The questions are objective.
f. Questions are presented in good psychological order, proceeding from general to more specific responses.
g. It is easy to tabulate and interpret.

13. (L5) The Likert-scale is a technique by which opinions held by an individual can be readily converted to numerical data. The scale is designed so the respondent is asked to select one of three or one of five possible choices which most nearly represent his/her opinion pertaining to each of many items on an opinionnaire.

MODULES -- COMMON CORE CURRICULUM FOR VOCATIONAL EDUCATION

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