

## **Chapter 1**

### **Introduction to Educational Research**

The purpose of Chapter One is to provide an overview of educational research and introduce you to some important terms and concepts. My discussion in this set of lectures will usually center around the same headings that are used in the book chapters. You might want to have your book open as you read through my lectures. My goal is to help you to better understand the material in the book.

#### **Why Study Educational Research?**

Here are a few reasons to take this course and learn about educational research:

- To become "research literate."
- Because we live in a society that's driven by research.
- To improve your critical thinking skills.
- To learn how to read and critically evaluate published research.
- To learn how to design and conduct research in case the need arises one day.

#### **Areas of Educational Research**

There are many areas in educational research. As you can see in Table 1.1 (reproduced here for your convenience), there are 10 major divisions in our largest Association and there are many special interest groups (SIGs). Do you see any areas that are of interest to you?

■ **TABLE 1.1** Divisions and Special Interest Groups in the American Educational Research Association. Note the special interest groups change slightly year to year.

**Major Divisions in the AERA**

Administration, Curriculum Studies  
 Counseling and Human Development  
 Education in the Professions  
 History and Historiography  
 Learning and Instruction

Measurement and Research Methodology  
 Postsecondary Education  
 School Evaluation and Program Development  
 Social Context of Education  
 Teaching and Teacher Education

**Special Interest Groups in the AERA**

Accelerated Schools  
 Action Research  
 Adolescence  
 Advanced Studies of National Databases  
 American Indian/Alaskan Native Education  
 Artificial Intelligence and Education  
 Arts and Learning  
 Associates for Research on Private Education  
 Basic Research in Reading and Literacy  
 Bilingual Education Research  
 Brain and Education  
 Business Education and Information Systems Research  
 Career Development  
 Classroom Management  
 Computer Applications in Education  
 Constructivist Theory, Research, and Practice  
 Critical Issues in Curriculum  
 Early Education and Child Development  
 Economics Education  
 Education and Student Development in the Cities  
 Education in Science and Technology  
 Educational Enterprises  
 Educational Statisticians  
 Electronic Networking  
 Faculty Evaluation and Development  
 Families as Educators  
 Fiscal Issues, Policy, and Educational Finance  
 Futures Research and Strategic Planning  
 Instructional Supervision  
 Instructional Technology  
 International Studies  
 John Dewey Society  
 Language and Social Processes  
 Law and Education  
 Leadership Development, Training, and Research  
 Lesbian and Gay Studies  
 Literature  
 Measurement Services  
 Media, Culture, and Curriculum  
 Middle Level Education  
 Military Education and Training  
 Moral Development and Education  
 Motivation in Education  
 Multiple Linear Regression  
 Occupational Stress and Health

Organizational Theory  
 Peace Education  
 Philosophical Studies of Education  
 Politics of Education  
 Professional Licensure and Certification  
 Professors of Educational Research  
 Qualitative Research  
 Rasch Measurement  
 Religion and Education  
 Research Focus on Black Education  
 Research in Mathematics Education  
 Research in Social Studies Education  
 Research on Education of Asian and Pacific Americans  
 Research on Education of Deaf Persons  
 Research on Evaluation  
 Research on Giftedness and Talent  
 Research on Learning and Instruction in Physical Education  
 Research Using NAEP Data  
 Research Utilization  
 Restructuring Public Education  
 Rural Education  
 School Effectiveness and School Improvement  
 School-University Collaborative Research  
 Second Language Research  
 Self-Study of Teacher Education Practices  
 Semiotics in Education  
 Society of Professors of Education  
 Sociology of Education  
 Special Education Research  
 State and Regional Educational Research Associations  
 Structural Equation Modeling  
 Study of Learning Environments  
 Studying and Self-Directed Learning  
 Subject Knowledge and Conceptual Change  
 Survey Research in Education  
 Teacher as Researcher  
 Teachers' Work and Teachers' Unions  
 Teaching in Educational Administration  
 Textbooks, Textbook Publishing, and Schools  
 Training in Business and Industry  
 Vocabulary  
 Vocational Education  
 Writing

To learn more about the areas of educational research and current issues, we recommend that you explore the AERA website at <http://aera.net> . By the way, The AERA has great student membership rates.

**Examples of Educational Research**

Many examples of educational research are discussed throughout your textbook. To get you started, we have reproduced the abstracts from four journal articles in this section of

the book.

An excellent way to see examples of recent educational research articles is to browse through educational journals. One excellent journal to get you started is entitled the "Journal of Educational Psychology."

### **General Kinds of Research**

In this section we discuss five general kinds of research: basic research, applied research, evaluation research, action research, and orientational research.

#### **Basic and Applied Research**

*Basic research* is research aimed at generating fundamental knowledge and theoretical understanding about basic human and other natural processes. *Applied research* is focused on answering practical questions to provide relatively immediate solutions.

Basic and applied research can be viewed as two endpoints on a research continuum, with the center representing the idea that research can be applied research can contribute to basic research and vice versa. Here is the continuum:

Basic.....Mixed.....Applied

Research examining the process of cognitive "priming" is an example of relatively basic research; a comparison of the effectiveness of two approaches to counseling is an example of relatively applied research.

Basic and applied research are generally conducted by researchers at universities.

#### **Evaluation Research**

*Evaluation* involves determining the worth, merit, or quality of an evaluation object. Evaluation is traditionally classified according to its purpose:

- *Formative evaluation* is used for the purpose of program improvement.
- *Summative evaluation* is used for the purpose of making summary judgments about a program and decisions to continue or discontinue the program.

A newer and currently popular way to classify evaluation is to divide it into five types:

- *Needs assessment*, which asks this question: Is there a need for this type of program?
- *Theory assessment*, which asks this question: Is this program conceptualized in a way that it should work?
- *Implementation assessment*, which asks: Was this program implemented properly and according to the program plan?
- *Impact assessment*, which asks: Did this program have an impact on its intended targets?
- *Efficiency assessment*, which asks: Is this program cost effective?

Evaluation is generally done by program evaluators and is focused on specific programs or products.

### **Action Research**

*Action research* focuses on solving practitioner's local problems. It is generally conducted by the practitioners after they have learned about the methods of research and research concepts that are discussed in your textbook. It is important to understand that action research is also a state of mind; for example, teachers who are action researchers are constantly observing their students for patterns and thinking about ways to improve instruction, classroom management, and so forth. We hope you get this "state of mind" as you read our textbook!

### **Oriental Research**

*Oriental research* is done for the purpose of advancing an ideological position. It is traditionally called critical theory. We use the broader term orientational research because critical theory was originally concerned only with class inequalities and was based on the Karl Marx's theory of economics, society, and revolution.

Oriental research is focused on some form of inequality, discrimination, or stratification in society. Some areas in which inequality manifests itself are large differences in income, wealth, access to high quality education, power, and occupation. Here are some major areas of interest to orientational researchers:

- Class stratification (i.e., inequality resulting from one's economic class in society).
- Gender stratification (i.e., inequality resulting from one's gender).
- Ethnic and racial stratification (i.e., inequality resulting from one's ethnic or racial grouping).
- Sexual orientation stratification (i.e., inequality and discrimination based on one's sexual preferences)

Many orientational researchers work for universities or interest group organizations.

### **Sources of Knowledge**

In this section we discuss how people learn about the world around them and gain knowledge. The major ways we learn can be classified into experience, expert opinion, and reasoning.

#### **Experience**

The idea here is that knowledge comes from experience. Historically, this view was called *empiricism* (i.e., original knowledge comes from experience).

The term *empirical* means "based on observation, experiment, or experience."

#### **Expert Opinion**

Because we don't want to and don't have time to conduct research on everything, people frequently rely on expert opinion as they learn about the world. Note, however, that if

you rely on an expert's opinion it is important to make sure that the expert is an expert in the specific area under discussion and you should check to see if the expert has a vested interest in the issue.

### **Reasoning.**

Historically, this idea was called *rationalism* (i.e., original knowledge comes from thought and reasoning).

There are two main forms of reasoning:

- *Deductive reasoning* (i.e., the process of drawing a specific conclusion from a set of premises). Deductive reasoning is the classical approach used by the great rationalists in the history of western civilization. Note that, in formal logic and mathematics, a conclusion from deductive reasoning will necessarily be true if the argument form is valid and if the premises are true.
- *Inductive reasoning* (i.e., reasoning from the particular to the general). The conclusion from inductive reasoning is probabilistic (i.e., you make a statement about what will probably happen). The so called "problem of induction" is that the future might not resemble the present.

### **The Scientific Approach to Knowledge Generation**

Science is also an approach for the generation of knowledge. It relies on a mixture of empiricism (i.e., the collection of data) and rationalism (i.e., the use of reasoning and theory construction and testing).

### **Dynamics of science.**

Science has many distinguishing characteristics:

- Science is progressive. In other words, "We stand on the shoulders of giants" (Newton).
- Science is rational.
- Science is creative.
- Science is dynamic.
- Science is open.
- Science is "Critical."
- Science is never-ending.

### **Basic Assumptions of Science**

In order to do science, we usually make several assumptions. Here they are as summarized in Table 1.3.

■ **TABLE 1.3** Summary of Common Assumptions Made by Educational Researchers

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1. There is a world out there that can be studied. This can include studying the inner worlds of individuals.
  2. Some of the world is unique; some of it is regular or patterned or predictable; and much of it is dynamic and complex. (Note: These categories can sometimes overlap.)
  3. The unique, the regular, and the complex in the world all can be examined and studied by researchers.
  4. Researchers should try to follow certain agreed-on norms and practices.
  5. It is possible to distinguish between more and less plausible claims and between good and poor research.
  6. Science cannot provide answers to all questions.
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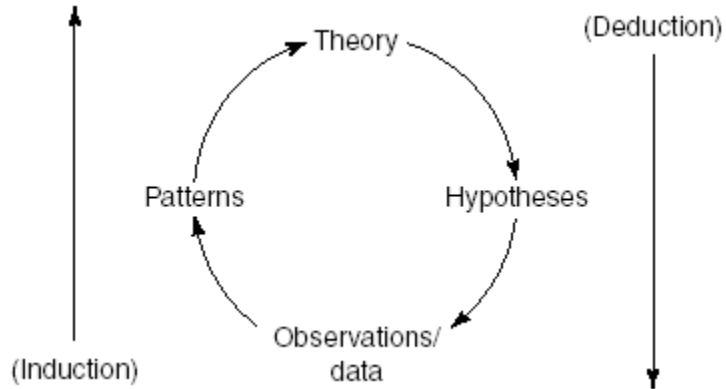
### Scientific Methods

There are many scientific methods. The two major methods are the inductive method and the deductive method.

- The *deductive method* involves the following three steps:
  1. State the hypothesis (based on theory or research literature).
  2. Collect data to test the hypothesis.
  3. Make decision to accept or reject the hypothesis.
- The *inductive method*. This approach also involves three steps:
  1. Observe the world.
  2. Search for a pattern in what is observed.
  3. Make a generalization about what is occurring.

Virtually any application of science includes the use of both the deductive and the inductive approaches to the scientific method either in a single study or over time. This idea is demonstrated in Figure 1.1. The inductive method is as “bottom up” method that is especially useful for generating theories and hypotheses; the deductive method is a “top down” method that is especially useful for testing theories and hypotheses.

■ FIGURE 1.1  
The research wheel



### **Theory**

The word "theory" most simply means "**explanation.**" Theories explain "How" and "Why" something operates as it does. Some theories are highly developed and encompass a large terrain (i.e., "big" theories or "grand" theories); others theories are "smaller" theories or briefer explanations.

We have summarized the key criteria to use in evaluating a theory in Table 1.4 and reproduced it here for your convenience.

■ TABLE 1.4 How to Evaluate the Quality of a Theory or Explanation

1. Is it (i.e., the theory or explanation) logical and coherent?
2. Is it clear and parsimonious?
3. Does it fit the available data?
4. Does it provide testable claims?
5. Have theory-based predictions been tested and supported?
6. Has it survived numerous attempts by researchers to identify problems with it or to falsify it?
7. Does it work better than competing or rival theories or explanations?
8. Is it general enough to apply to more than one place, situation, or person?
9. Can practitioners use it to control or influence things in the world (e.g., a good theory of teaching helps teachers to positively influence student learning; a good theory of counseling helps counselors to positively influence their clients' mental health)?

### **The Principle of Evidence**

According to the principle of evidence, what is gained in empirical research is *evidence*, NOT proof. This means that knowledge based on educational research is ultimately tentative. Therefore, please eliminate the word "proof" from your vocabulary when you talk about research results. Empirical research provides evidence; it does not provide proof. Also note that, evidence increases when a finding has been *replicated*. Hence, you should take NOT draw firm conclusions from a single research study.

## **Objectives of Educational Research**

There are five major objectives of educational research.

1. *Exploration*. This is done when you are trying to generate ideas about something.
2. *Description*. This is done when you want to describe the characteristics of something or some phenomenon.
3. *Explanation*. This is done when you want to show how and why a phenomenon operates as it does. If you are interested in causality, you are usually interested in explanation.
4. *Prediction*. This is your objective when your primary interest is in making accurate predictions. Note that the advanced sciences make much more accurate predictions than the newer social and behavioral sciences.
5. *Influence*. This objective is a little different. It involves the application of research results to impact the world. A demonstration program is an example of this.

One convenient and useful way to classify research is into exploratory research, descriptive research, explanatory research, predictive research, and demonstration research.