Chapter 1: Introduction to Educational Research

Lecture Notes

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 12 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*

Major Divisions in the AERA

Division A: Administration, Organization, & Leadership	Division G: Social Context of Education
Division B: Curriculum Studies	Division H: Research, Evaluation, & Assessment in Schools
Division C: Learning & Instruction	Division I: Education in the Professions
Division D: Measurement & Research Methodology	Division J: Postsecondary Education
Division E: Counseling & Human Development	Division K: Teaching & Teacher Education
Division F: History & Historiography	Division L: Educational Policy & Politics

Special Interest Groups in the AERA (called SIGs)

Academic Audit Research in Teacher Education	Districts in Research and Reform
Action Research	Doctoral Education across the Disciplines
Adolescence and Youth Development	Early Education and Child Development
Adult Literacy and Adult Education	Ecological and Environmental Education
Adulthood and Aging	Education and Philanthropy
Advanced Studies of National Databases	Education and Student Development in Cities
Advanced Technologies for Learning	Education, Health, and Human Services Linkages
Applied Research in Virtual Environments for Learning	Educational Change
Arts and Inquiry in the Visual and Performing Arts in Education	Educational Statisticians
Arts and Learning	Faculty Teaching, Evaluation, and Development
Arts-Based Educational Research	Family and Consumer Sciences
Associates for Research on Private Education	Family, School, Community Partnerships
Bilingual Education Research	Fiscal Issues, Policy, and Education Finance
Biographical and Documentary Research	Foucault and Contemporary Theory in Education
Brain, Neurosciences, and Education	Grassroots Community & Youth Organizing for
Business Education & Computer Information Systems Research	Education Reform
Career and Technical Education	Hierarchical Linear Modeling
Career Development	Hispanic Research Issues
Caribbean and African Studies in Education	Holistic Education
Catholic Education	Inclusion & Accommodation in Educational Assessment
Chaos & Complexity Theories	Indigenous Peoples of the Americas
Charter School Research and Evaluation	Indigenous Peoples of the Pacific
Classroom Assessment	Informal Learning Environments Research
Classroom Management	Instructional Technology
Classroom Observation	International Studies
Cognition and Assessment	Invitational Learning
Communication of Research	Ivan Illich
Computer and Internet Applications in Education	John Dewey Society
Conflict Resolution and Violence Prevention	Language and Social Processes
Confluent Education	Large Scale Assessment
Confucianism, Taoism, and Education	Law and Education
Constructivist Theory, Research, and Practice	Leadership for School Improvement
Cooperative Learning: Theory, Research, and Practice	Leadership for Social Justice
Critical Educators for Social Justice	Learning and Teaching in Educational Leadership
Critical Examination of Race, Ethnicity, Class, and	Learning Environments
Gender in Education	Learning Sciences
Critical Issues in Curriculum and Cultural Studies	Literature
Critical Perspectives on Early Childhood Education	Lives of Teachers
Cultural Historical Research	Longitudinal Studies
Democratic Citizenship in Education	Marxian Analysis of Society, Schools, and Education
Design and Technology	Measurement Services
Disability Studies in Education	Media, Culture, and Curriculum

Mentorship and Mentoring Practices	Research on Women and Education
Middle-Level Education Research	Research Use
Mixed Methods Research	Rural Education
Moral Development and Education	Safe Schools and Communities
Motivation in Education	School Choice
Multicultural/Multiethnic Education: Research, Theory, and Practice	School Community, Climate, and Culture
Multiple Intelligences: Theory and Practice	School Effectiveness and School Improvement
Multiple Linear Regression: The General Linear Model	School Indicators, Profiles, and Accountability
Music Education	School Turnaround and Reform
NAEP Studies	School/University Collaborative Research
Narrative Research	Science Teaching and Learning
Online Teaching and Learning	Second Language Research
Organizational Theory	Self-Study of Teacher Education Practices
Out-of-School Time	Semiotics in Education
Paulo Freire, Critical Pedagogy, and Emancipation	Service-Learning & Experiential Education
Peace Education	Social and Emotional Learning
Philosophical Studies in Education	Society of Professors of Education
Politics of Education	Sociology of Education
Portfolios and Reflection in Teaching and Teacher Education	Special Education Research
Postcolonial Studies and Education	Spirituality & Education
Problem-Based Education	State and Regional Educational Research Associations
Professional Development School Research	Stress and Coping in Education
Professional Licensure and Certification	Structural Equation Modeling
Professors of Educational Research	Studying and Self-Regulated Learning
Qualitative Research	Supervision and Instructional Leadership
Queer Studies	Survey Research in Education
Rasch Measurement	Systems Thinking in Education
Religion and Education	Talent Development of Students Placed at Risk
Research, Education, Information, and School Libraries	Teacher as Researcher
Research Focus on Black Education	Teacher's Work/Teachers Unions
Research Focus on Education and Sport	Teaching Educational Psychology
Research in Global Child Advocacy	Teaching History
Research in Mathematics Education	Technology as an Agent of Change in Teaching and Learning
Research in Reading and Literacy	Technology, Instruction, Cognition, & Learning
Research in Social Studies Education	Test Validity Research and Evaluation
Research on Evaluation	Tracking and Detracking
Research on Giftedness, Creativity, and Talent	Urban Learning, Teaching, and Research
Research on Learning and Instruction in Physical Education	Vocabulary
Research on Teacher Induction	Workplace Learning
Research on the Education of Asian and Pacific Americans	Writing and Literacies
Research on the Education of Deaf Persons	
Research on the Superintendency	

*For more information about any of these divisions or special interest groups, go to the AERA website at http://aera.net.

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 of discontinue the program.

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

- *Needs assessment,* which ask 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!

Orientational Research

Orientational 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.

Orientational 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)

- Disabilities stratification (i.e., inequality and discrimination based on someone's physical or mental disability)

- National/international inequalities (e.g., wealthy nations versus developing nations).

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 two major ways that we learn are through experience 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."

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 conclusion that is necessarily true if the premises are true). Deductive reasoning is the classical approach used by the great rationalists in the history of western civilization.

- *Inductive reasoning* (i.e., the process of drawing a conclusion that is "probably" true). The so called "problem of induction" is that the future

might not resemble the present, which is a major reason why we don't get "proof" in empirical research.

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

1. There is a world 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.

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.

Scientific Methods

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

- The *confirmatory* or *deductive method* involves the following three steps:

    1. State the hypothesis (based on theory or research literature) and deduce what must occur if the hypothesis is true.

    2. Collect data to test the hypothesis.

    3. Make a decision to tentatively accept or reject the hypothesis.

- The *exploratory or 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 or conclusion about what is occurring.

The confirmatory method is a top-down or theory/hypothesis testing approach to research. It is used by most quantitative researchers. They state their hypotheses, make predictions about what must occur if a hypothesis is supported (and what will happen if the hypothesis is to be rejected), collect data, analyze the data, and draw a conclusion (hypothesis is supported or hypothesis is rejected).

The exploratory method is a bottom-up or theory generation approach to research. It is used by many qualitative researchers. They enter the field with no predetermined theory and learn from what the see. They start with the particulars, the many things they see in the world and develop descriptions of what they see and sometimes they develop theories based on what they see/observe.

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

■ **FIGURE 1.1**

The Research Wheel
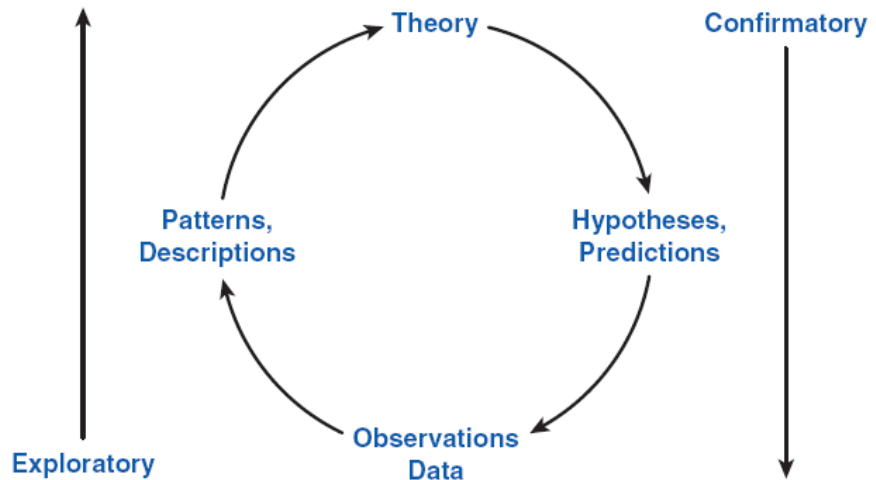
Theory

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 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 influence student learning positively; a good theory of counseling helps counselors to influence their clients' mental health positively)?

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.