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RESEARCH IN EDUCATION

TENTH EDITION



JOHN W. BEST — JAMES V. KAHN

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Preface

The tenth edition of *Research in Education* has the same goals as the previous editions. The book is meant to be used as a research reference or as a text in an introductory course in research methods. It is appropriate for graduate students enrolled in a research course or seminar, for those writing a thesis or dissertation, or for those who carry on research as a professional activity. All professional workers should be familiar with the methods of research and the analysis of data. If only as consumers, professionals should understand some of the techniques used in identifying problems, forming hypotheses, constructing and using data-gathering instruments, designing research studies, and employing statistical procedures to analyze data. They should also be able to use this information to interpret and critically analyze research reports that appear in professional journals and other publications.

No introductory course can be expected to confer research competence, nor can any book present all relevant information. Research skill and understanding are achieved only through the combination of course-work and experience. Graduate students may find it profitable to carry on a small-scale study as a way of learning about research.

This edition expands and clarifies a number of ideas presented in previous editions. Additional concepts, procedures, and examples have been added. **A totally new aspect of this text is directed access to the information and technology available in Research Navigator, which contains pertinent articles available on-line.** As a result, the reader is able to locate articles associated with various terms cited in the page margins throughout this book. In all cases, we used the *Education Database of ContentSelect*. We also used Research Navigator in the exercises for most of the chapters (all except Chapters 2, 3, 4, and 12). These exercises ask questions that can be answered by going to a specific article identified in the exercise number.

Also completely new to this edition is the instructor option to add a CD containing a copy of SPSS for Windows, Student Version. The only limitation of the student version is the number of subjects and variables that can be used in the analyses. All of the sample analyses found in this text can be carried out using the student version.

Each of the five methodology chapters has the text of an entire published article following it that illustrates that type of research. Nothing substantive has been deleted from the ninth edition. Appendix B contains a data set for use by students

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in Chapters 10, 11, and 12. This edition, as also was true of all of the earlier editions, has been written to conform to the guidelines of the American Psychological Association's (APA) *Publications Manual* (now in its 5th edition). The writing style suggested in Chapter 3 is also in keeping with the APA manual.

Many of the topics covered in this book may be peripheral to the course objectives of some instructors. It is not suggested that all of the topics in this book be included in a single course. It is recommended that instructors use the topics selectively and in the sequence that they find most appropriate. The portion of the book not used in those courses can then be used by the student in subsequent courses, to assist in carrying out a thesis, and/or as a reference.

This revision benefited from the comments of the second author's students who had used the earlier editions of this text. To them and to the reviewers: Mark Isham, Eastern New Mexico University; Richard A. McInturf, East Tennessee State University; and Mary O'Keeffe, Providence College, we express our appreciation. We wish to acknowledge the cooperation of the staff of the University of Illinois at Chicago Library and Computer Center.

J.W.B.

J.V.K.

Using Research Navigator™



This edition of *Research in Education* is designed to integrate the content of the book with the following resources of Research Navigator™, a collection of research databases, instruction, and contemporary publications available to you online at www.researchnavigator.com.

- **EBSCO's ContentSelect Academic Journal Database** organized by subject, with each subject containing leading academic journals for each discipline.
- *The New York Times*, one of the most highly regarded publications of today's news. View the full text of articles from the previous year.
- **Link Library** connects users to thousands of websites for discipline-specific key terms.
- **Research Review and Preparation.** A special section called "Understanding the Research Process" helps you work your way through the research process.

CONNECTING THE BOOK WITH RN™

As you read this book, you'll see special Research Navigator™ (RN) icons cueing you to visit the ContentSelect database on the Research Navigator™ website to expand on the concepts of the text and to further explore the work being done in the field of Educational Research. RN learning aids in the book include:

1. **Marginal keyword search terms.** Appearing in the margins of the text, these already tested terms will guide your search on topics relevant to the course content and will yield an abundance of sources from a variety of perspectives that will broaden your exposure to key topics. Begin by searching the ContentSelect database, and then check out the other databases as well.
2. **Applied research activities and projects.** At the end of each chapter, special RN exercises provide more practice



using the ContentSelect database in Research Navigator™ and beyond the book to library and field research.

It's now time to enter Research Navigator™. Purchase of this book provides you free access to this exclusive pool of information and data. The following walk-through illustrates, step-by-step, the various ways this valuable resource can make your research process more interesting and successful.

REGISTRATION

In order to begin using Research Navigator™, you must first register using the personal access code found on the inside of the front cover of your book. Follow these easy steps:

1. Click "Register" under New Users on the left side of the home page screen.




2. Enter the access code exactly as it appears on the inside front cover of your book or on your access card. (Note: Access codes can only be used once to complete one registration. If you purchased a used text, the access code may not work.)

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Please enter your six-word code without dashes. You can type the letters in lowercase or uppercase.

Example
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☐ **Yes, look me up.**

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4. Once you have successfully completed registration, write down the Login Name and Password you just created and keep it in a safe place. You will need to enter it each time you want to revisit Research Navigator™.
5. Once you register, you have access to all the resources in Research Navigator™ for six months. Each time you enter Research Navigator™, log in by simply going to the “Returning Users” section on the left side of the home page and type in your Login ID and Password.



GETTING STARTED

You're now official! The options available to you on Research Navigator™ are plenty. From Research Navigator™'s home page, you have easy access to all of the site's main features, including a quick route to the three exclusive databases of source content. If you are new to the research process, you may want to start by browsing “Understanding the Research Process.”

This section of the site can be helpful even for those with some research experience but who might be interested in some helpful tips. Here you will find extensive help on all aspects of the research process including:

- Introduction to the Research Paper
- Gathering Data
- Searching the Internet
- Evaluating Sources
- Organizing Ideas
- Writing Notes
- Drafting the Paper
- Academic Citation Styles (i.e., MLA, APA, CMS)
- Blending Reference Material into Your Writing
- Practicing Academic Integrity
- Revising
- Proofreading
- Editing the Final Draft

COMPLETING RESEARCH

The first step in completing a research assignment or research paper is to select a topic. Your instructor may assign you a topic, or you may find suggested topics in the margins or at the end of chapters throughout this book. Once you have selected and

narrowed your research topic, you are now ready to *gather data*. Research simplifies your research efforts by giving you three distinct types of source material commonly used in research assignments: academic journals (ContentSelect), newspaper articles (*The New York Times*), and World Wide Web sites (Link Library).

1. EBSCO's ContentSelect

The first database you'll find on Research Navigator™ is ContentSelect, which contains the EBSCO Academic Journal and Abstract Database containing scholarly, peer-reviewed journals (such as *Journal of Education Policy* and *Assessment & Evaluation in Higher Education*). The information obtained in these individual articles is more scientific than information you would find in a popular magazine, in a newspaper article, or on a Web page. Searching for articles in ContentSelect is easy!

Within the ContentSelect Research Database section, you will see a list of disciplines and a space to type keywords. You can search within a single discipline or multiple disciplines. Choose one or more subject databases, and then enter a keyword you wish to search. Click on "Go."

Now you'll see a list of articles that match your search. From this page you can examine either the full text or the abstract of each of the articles and determine which will best help with your research. Print out the articles or save them in your "Folder" for later reference.

Search for Source Material

EBSCO's

ContentSelect

Academic Journal Database

Exclusive to instructors and students using Pearson Education textbooks, the ContentSelect Research Database gives students instant access to thousands of academic journals and periodicals from any computer with an Internet connection!

Search by Keyword

You must select a database to search. To select multiple, hold down the alt or command key.

Communication

Communication Sciences & Disorders

Computer & Information Science

Criminal Justice

Education

Engineering

Mixed Methods

Go

Log in to search.

2. *The New York Times*

Searching *The New York Times* gives you access to articles from one of the world's leading newspapers. The first step in using the search-by-subject archive is to indicate the subject area you wish to search. You have the option of searching one specific subject at a time by highlighting the subject area or searching all subjects by highlighting "All." Click on "Go" now for a complete listing of articles in your chosen subject area that have appeared in *The New York Times* over the last year, sorted by most recent article first. For a more focused search, type a word, or multiple words separated by commas, into the search box and click "Go" for a list of articles. Articles can be printed or saved for later use in your research assignment.



The New York Times Search by
ON THE WEB Subject Archive

Archive of New York Times articles from January 1, 2002.

Search by Subject

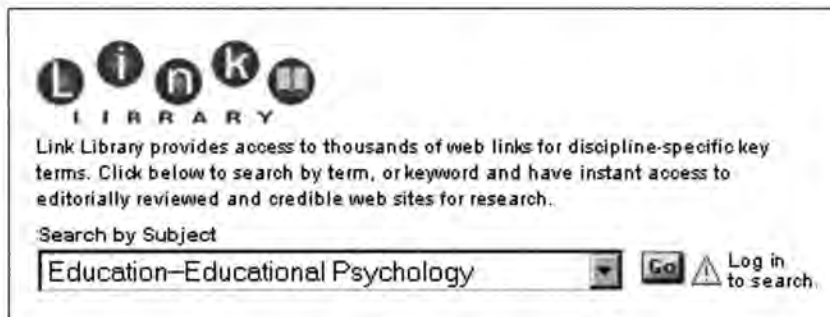
Education Research

Search by Keyword

Mixed Methods

3. "Best of the Web" Link Library

The third database of content included on Research Navigator™ is a collection of Web links, organized by academic subject and key terms. To use this database, simply select a subject from the dropdown list and find the key term for the topic you are searching. Click on the key term and see a list of editorially reviewed websites that offer educationally relevant and credible content. The Web links in Link Library are monitored and updated each week, reducing your incidence of finding "dead" links.



Link Library

Link Library provides access to thousands of web links for discipline-specific key terms. Click below to search by term, or keyword and have instant access to editorially reviewed and credible web sites for research.

Search by Subject

Education-Educational Psychology



USING YOUR LIBRARY

While Research Navigator™ does contain a vast amount of information to assist you with your research, it does not try to replace the library. After you have selected your topic and gathered source material from the three databases of content, you may need to go to your school library to complete your research. Finding information at the library, however, can seem overwhelming. Research Navigator™ provides some assistance in this area as well. Research Navigator™ includes discipline-specific “library guides” for you to use as a road map. Each guide includes an overview of the discipline’s major subject databases, online journals, and key associations and newsgroups. Print them out and take them with you to the library!

CAUTION! Please note that the Research Navigator™ site undergoes frequent changes as new and exciting options are added to assist with research endeavors. For the latest information on the options available to you on Research Navigator™, visit www.researchnavigator.com.

Part I

Introduction to Educational Research: Definitions, Research Problems, Proposals, and Report Writing

The first three chapters of this book explore the historical underpinnings of educational research, define some basic concepts, describe the processes of selecting a research problem to be investigated and writing a research proposal, and demonstrate a style of writing that can be used to write research reports, research proposals, and term papers.

Chapter 1 introduces the research endeavor. Such matters as methods of science, the importance of theory, the formulation of hypotheses, sampling techniques, and an overview of the methodologies used in educational research are described. Different types of educational research—historical, quantitative descriptive, qualitative, and experimental—are briefly described.

Chapter 2 describes the process by which a research problem is identified. This is one of the most difficult steps in the research process for beginners and sometimes for experienced researchers as well. This chapter also discusses the ethics of conducting research with humans in detail using the Federal regulations. Also included are ethic statements by both the American Psychological Association and American Educational Research Association. Finally, some suggestions for library research and how to write a research proposal are presented.

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Chapter 3 describes one style for writing a research report, the American Psychological Association. This style was selected because it is the most commonly accepted by journals in the field of education and psychology. The description includes writing style, preparing the manuscript, referencing, tables, and figures. This chapter also briefly describes an approach to evaluating research reports written by others.

1

Fundamentals of Research

Why Should You Study Research?

Many students ask me why they need to learn about research. After all, they say, they are only going to be teachers (or other educational professionals). My answer to them is always in two parts.

First, hopefully you will have long careers in education that will require you to keep abreast of the changes and improvements in the field. In order to do this you will need to be knowledgeable consumers of educational research. We believe, as do many of our colleagues who require courses like the one you are taking, that students can best learn to be consumers of research by understanding the research process from the researcher's perspective. To understand the full implications of research as it might affect you, you will need to appreciate the decisions that the researcher needs to make, possible alternatives to those decisions, and the consequences of the results and conclusions. Finally, you will need to judge the quality of the research and the possibility of it generalizing to your setting.

Second, teachers and other educational professionals continually need to examine what they are doing. In this, you may need to compare your practices with different methods used by others in similar settings. You may conduct action research to determine if a procedure is working for you or whether you need to try something new with a given student or class. In addition, collaboration of teachers with university researchers is becoming commonplace. As such, it is not unlikely that at some time in the near future a researcher will ask you to collaborate on a project or you may even ask a researcher to collaborate on one with you.

The Search for Knowledge

Human beings are the unique product of their creation and evolution. In contrast to other forms of animal life, their more highly developed nervous system has enabled them to develop sounds and symbols (letters and numbers) that make



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possible the communication and recording of their questions, observations, and ideas.

It is understandable that their greater curiosity, implemented by their control of symbols, would lead people to speculate about the operation of the universe, the great forces beyond their own control. Over many centuries people began to develop what seemed to be plausible explanations. Attributing the forces of nature to the working of supernatural powers, they believed that the gods manipulated the sun, stars, wind, rain, and lightning at their whim.

The appearance of the medicine man or priest, who claimed special channels of communication with the gods, led to the establishment of a system of religious authority passed on from one generation to another. A rigid tradition developed, and a dogma of nature's processes, explained in terms of mysticism and the authority of the priesthood, became firmly rooted, retarding further search for truth for centuries.

But gradually people began to see that the operations of the forces of nature were not as capricious as they had been led to believe. They began to observe an orderliness in the universe and certain cause-and-effect relationships; they discovered that under certain conditions events could be predicted with reasonable accuracy. However, these explanations were often rejected if they seemed to conflict with the dogma of religious authority. Curious persons who raised questions were often punished and even put to death when they persisted in expressing doubts suggested by such unorthodox explanations of natural phenomena.

This reliance on empirical evidence or personal experience challenged the sanction of vested authority and represented an important step in the direction of scientific inquiry. Such pragmatic observation, however, was largely unsystematic and further limited by the lack of an objective method. Observers were likely to overgeneralize on the basis of incomplete experience or evidence, to ignore complex factors operating simultaneously, or to let their feelings and prejudices influence both their observations and their conclusions.

It was only when people began to think systematically about thinking itself that the era of logic began. The first systematic approach to reasoning, attributed to Aristotle and the Greeks, was the deductive method. The categorical syllogism was one model of thinking that prevailed among early philosophers. Syllogistic reasoning established a logical relationship between a *major premise*, a *minor premise*, and a *conclusion*. A major premise is a self-evident assumption, previously established by metaphysical truth or dogma, that concerns a relationship; a minor premise is a particular case related to the major premise. Given the logical relationship of these premises, the conclusion is inescapable.

A typical Aristotelian categorical syllogism follows:

Major Premise: All men are mortal.

Minor Premise: Socrates is a man.

Conclusion: Socrates is mortal.

This deductive method, moving from the general assumption to the specific application, made an important contribution to the development of modern prob-

lem solving. But it was not fruitful in arriving at new truths. The acceptance of incomplete or false major premises that were based on old dogmas or unreliable authority could only lead to error. Semantic difficulties often resulted from shifting definitions of the terms involved.

Centuries later Francis Bacon advocated direct observation of phenomena, arriving at conclusions or generalizations through the evidence of many individual observations. This inductive process of moving from specific observations to the generalization freed logic from some of the hazards and limitations of deductive thinking. Bacon recognized the obstacle that the deductive process placed in the way of discovering new truth: It started with old dogmas that religious or intellectual authorities had already accepted and thus could be expected to arrive at few new truths. These impediments to the discovery of truth, which he termed "idols," were exposed in his *Novum Organum*, written in 1620.

The following story, attributed to Bacon, expresses his revolt against the authority of the written word, an authority that dominated the search for truth during the Middle Ages:

In the year of our Lord, 1432, there arose a grievous quarrel among the brethren over the number of teeth in the mouth of a horse. For thirteen days the disputation raged without ceasing. All the ancient books and chronicles were fetched out, and wonderful and ponderous erudition was made manifest. At the beginning of the fourteenth day a youthful friar of goodly bearing asked his learned superiors for permission to add a word, and straightway, to the wonder of the disputants, whose deep wisdom he sorely vexed, he beseeched them in a manner coarse and unheard of, to look in the mouth of a horse and find answers to their questionings. At this, their dignity being grievously hurt, they waxed exceedingly wroth; and joining in a mighty uproar they flew upon him and smote him hip and thigh and cast him out forthwith. For, said they, "Surely Satan hath tempted this bold neophyte to declare unholy and unheard-of ways of finding truth, contrary to all the teachings of the fathers." After many days of grievous strife the dove of peace sat on the assembly, and they, as one man, declaring the problem to be an everlasting mystery because of a dearth of historical and theological evidence thereof, so ordered the same writ down. (Mees, 1934, pp. 13–14)

The method of inductive reasoning proposed by Bacon, a method new to the field of logic but widely used by the scientists of his time, was not hampered by false premises, by the inadequacies and ambiguities of verbal symbolism, or by the absence of supporting evidence.

But the inductive method alone did not provide a completely satisfactory system for the solution of problems. Random collection of individual observations without a unifying concept or focus often obscured investigations and therefore rarely led to a generalization or theory. Also, the same set of observations can lead to different conclusions and support different, even opposing, theories.

The deductive method of Aristotle and the inductive method of Bacon were fully integrated in the work of Charles Darwin in the nineteenth century. During his early career his observations of animal life failed to lead to a satisfactory theory

of man's development. The concept of the struggle for existence Malthus's *Essay on Population* intrigued Darwin and suggested the assumption that natural selection explains the origin of different species of animals. This hypothesis provided a needed focus for his investigations. He proceeded to deduce specific consequences suggested by the hypothesis. The evidence he gathered confirmed the hypothesis that biological change in the process of natural selection, in which favorable variations were preserved and unfavorable ones destroyed, resulted in the formation of new species.

The major premise of the older deductive method was gradually replaced by an assumption, or *hypothesis*, that was subsequently tested by the collection and logical analysis of data. This deductive-inductive method is now recognized as an example of a scientific approach.

John Dewey (1938) suggested a pattern that is helpful in identifying the elements of a deductive-inductive process:



A Method of Science

1. Identification and definition of the problem
2. Formulation of a hypothesis—an idea as to a probable solution to the problem, an intelligent guess or hunch
3. Collection, organization, and analysis of data
4. Formulation of conclusions
5. Verification, rejection, or modification of the hypothesis by the test of its consequences in a specific situation

Although this pattern is a useful reconstruction of some methods of scientific inquiry, it is not to be considered the *only* scientific method. There are many ways of applying logic and observation to problem solving. An overly rigid definition of the research process would omit many ways in which researchers go about their tasks. The planning of a study may include a great deal of exploratory activity, which is frequently intuitive or speculative and at times a bit disorderly. Although researchers must eventually identify a precise and significant problem, their object may initially be vague and poorly defined. They may observe situations that seem to suggest certain possible cause-and-effect relationships and even gather some preliminary data to examine for possible relevancy to their vaguely conceived problem. Thus, much research begins with the inductive method. At this stage imagination and much speculation are essential to the formulation of a clearly defined problem that is susceptible to the research process. Many students of research rightly feel that problem identification is one of the most difficult and most crucial steps of the research process.

Frequently researchers are interested in complex problems, the full investigation of which requires a series of studies. This approach is known as *programmatic research* and usually combines the inductive and deductive methods in a continuously alternating pattern. The researcher may begin with a number of observations from which a hypothesis is derived (inductive reasoning). Then the

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