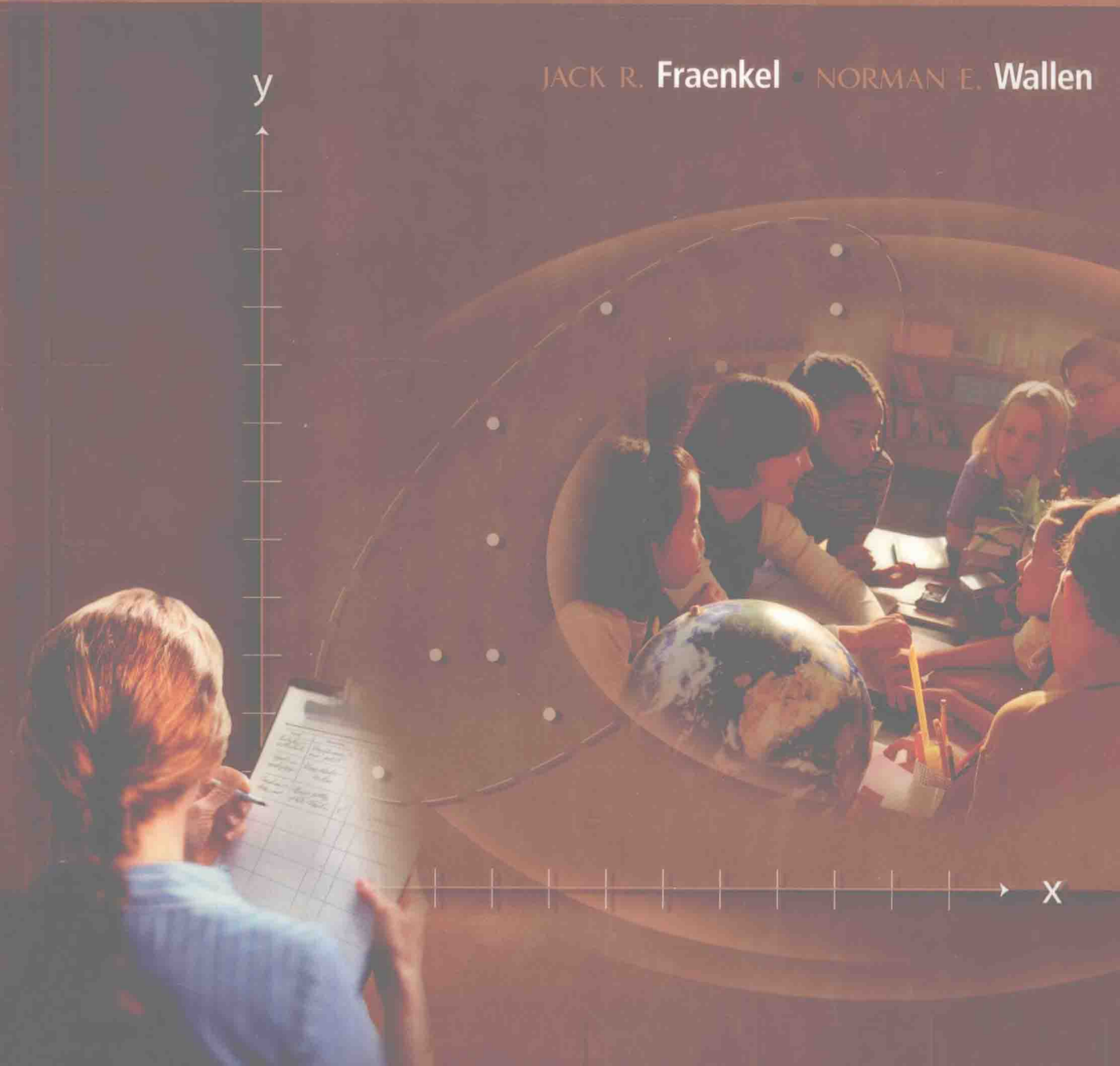


HOW TO Design AND Evaluate Research IN Education

FIFTH EDITION

JACK R. Fraenkel • NORMAN E. Wallen



How to **Design** and **Evaluate** **Research in Education**

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San Francisco State University

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HOW TO DESIGN AND EVALUATE RESEARCH IN EDUCATION

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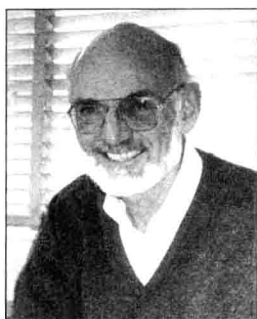
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Norman E. Wallen is Professor Emeritus of Interdisciplinary Studies in Education at San Francisco State University, where he taught from 1966 to 1992. An experienced researcher, he received his Ph.D. from Syracuse University and taught courses in statistics and research design to

master's and doctoral students for many years. He is a recent member of the City Council of Flagstaff, Arizona, and the Executive Committee, Grand Canyon Chapter of the Sierra Club.

To Marge and Lina for all their support

Preface

How to Design and Evaluate Research in Education is directed to students taking their first course in educational research. Because this field continues to grow so rapidly with regard to both the knowledge it contains and the methodologies it employs, the authors of any introductory text are forced to carefully define their goals as a first step in deciding what to include in their book. In our case, we continually kept three main goals in mind. We wanted to produce a text that would:

1. Provide students with the basic information needed to understand the research process, from idea formulation through data analysis and interpretation.
2. Enable students to use this knowledge to design their own research investigation on a topic of personal interest.
3. Permit students to read and understand the literature of educational research.

The first two goals are intended to satisfy the needs of those students who must plan and carry out a research project as part of their course requirements. The third goal is aimed at students whose course requirements include learning how to read and understand the research of others. Many instructors, ourselves included, build all three goals into their courses, since each one seems to reinforce the others. It is hard to read and fully comprehend the research of others if you have not yourself gone through the process of designing and evaluating a research project. Similarly, the more you read and evaluate the research of others, the better equipped you will be to design your own meaningful and creative research. In order to achieve the above goals, we have developed a book with the following characteristics.

CONTENT COVERAGE

Goal one, to provide students with the basic information needed to understand the research process, has resulted in an eight-part book plan. Part One (Chapter One) introduces students to the nature of educational research, briefly overviews each of the seven methodologies discussed later in the text, and presents an overview of the research process as well as criticisms of it.

Part Two (Chapters Two through Nine) discusses the basic concepts and procedures that must be understood before one can engage in research intelligently or critique it meaningfully. These chapters explain variables, definitions, ethics, sampling, instrumentation, validity, reliability, and internal validity. These and other concepts are covered thoroughly, clearly, and relatively simply. Our emphasis throughout is to show students, by means of clear and appropriate examples, how to set up a research study in an educational setting on a question of interest and importance.

Part Three (Chapters Ten through Twelve) describes in some detail the processes involved in collecting and analyzing data.

Parts Four (Chapters Thirteen through Seventeen) describes and illustrates the methodologies most commonly used in quantitative educational research. Many key concepts presented in Part Two are considered again in these chapters in order to illustrate their application to each methodology. Finally, each methodology chapter concludes with a carefully chosen study from the published research literature. Each study is analyzed by the authors with regard to both its strengths and weaknesses. Students are shown how to read and critically analyze a study they might find in the literature.

Part Five (Chapters Eighteen through Twenty) and Six (Chapters Twenty-One through Twenty-Three) discuss qualitative research. Part Five begins the coverage by describing qualitative research, its philosophy, and essential features. It has been expanded to include various types of qualitative research as well as combinations of quantitative and qualitative methods. This is followed by an expanded treatment of both data collection and analysis methods. Part Six presents the qualitative methodologies of ethnography and historical research. As with the quantitative methodology chapters, these are followed by a carefully chosen research report from the published research literature, along with our analysis and critique.

Part Seven (Chapter 23) describes the assumptions characteristics, and steps of action research. Classroom examples of action research questions bring the subject to life, as does the addition of a critique of a published study.

Part Eight (Chapter 24) shows how to prepare a research proposal or report (involving a methodology of choice) that builds on the concepts and examples developed and illustrated in previous chapters.

RESEARCH EXERCISES

In order to achieve our second goal of helping students learn to apply their knowledge of basic processes and methodologies, we organized the first 12 chapters in the same order that students normally follow in developing a research proposal or conducting a research project. Then we concluded each of these chapters with a research exercise that includes a fill-in problem sheet. These exercises allow students to apply their understanding of the major concepts of each chapter. When completed, these accumulated problem sheets will have led students through the step-by-step processes involved in designing their own research projects. Although this step-by-step development requires some revision of their work as they learn more about the research process, the gain in understanding that results as they slowly see their proposal develop “before their eyes” justifies the extra time and effort involved.

Problem Sheet templates are located in the Student Workbook, and electronically on the Interactive Student CD-ROM and the Online Learning Center.

ACTUAL RESEARCH STUDIES

Our third goal, to enable students to read and understand the literature of educational research, has led us to

conclude each of the methodology chapters in Parts Four, Five, and Six with an annotated study that illustrates a particular research method. At the end of each study we analyze its strengths and weaknesses and offer suggestions as to how it might be improved. Similarly, at the end of our chapter on writing research proposals and reports, we include a student research proposal that we have critiqued with marginal comments. This annotated proposal has proved an effective means of helping students understand both good and questionable research practices.

STYLE OF PRESENTATION

Because students are typically anxious regarding the content of research courses, we have taken extraordinary care not to overwhelm them with dry, abstract discussions. More than any text to date, our presentations are laced with clarifying examples and with summarizing charts, tables, and diagrams. Our experience in teaching research courses for more than 30 years has convinced us that there is no such thing as having “too many” examples in a basic text.

In addition to the many examples and illustrations that are embedded in our (we hope) informal writing style, we have built the following pedagogical features into the book: (1) a graphic organizer for each chapter, (2) chapter objectives, (3) chapter-opening examples, (4) end-of-chapter summaries, (5) key terms with page references, (6) discussion questions, and (7) an extensive end-of-book glossary.

CHANGES IN THE FIFTH EDITION

All chapters have been revised and updated. The book has been reorganized into eight parts. Parts One through Four (Chapters One through Seventeen), dealing with quantitative research, remain as they were in previous editions, although much of the material in each has been revised and updated. Part Five has been expanded and reorganized into two new parts: Introduction to Qualitative Research (Part Five, consisting of three chapters), and Qualitative Research Methodologies (Part Six, consisting of two chapters). We have added a chapter that discusses recent developments in Action Research (Part Seven). Part Eight continues to deal with the writing of research proposals and reports.

Much new material has been added to many chapters, including a comparison of the philosophic assumptions underlying qualitative and quantitative research,

techniques and procedures involved in interview research, mixed-method models, action research, an expanded discussion of power in quantitative research, and the coding of qualitative data.

Several new examples of published research, along with our analysis and annotation of each, have been added. In addition, more than 50 new illustrations and figures have been included.

SPECIAL FEATURES



The fifth edition has retained the popular *More About Research* feature and introduces two new features: *Research Tips* and *Controversies in Research*. *More About Research* continues to take a closer look at important topics in educational research and application to other fields. *Research Tips* provides practical suggestions for doing research. *Controversies in Research* focuses on controversial issues in educational research. A complete listing of these features is located on pages vii and viii.

INTERACTIVE AND APPLIED LEARNING





The existing theme of interactive and applied learning has been highlighted and expanded in the fifth edition. At the start of each chapter, the *Interactive and Applied Learning Tools* feature lists the different activities and resources available for the student while studying the


chapter. At the end of each chapter, students are reminded of the student study guide resources available on the Interactive Student CD-ROM and the Online Learning Center.

STUDENT SUPPLEMENTS

Three supplements were developed for students using *How to Design and Evaluate Research in Education*.

 The Interactive Student CD-ROM includes a student study guide (with quizzes and key term practice activities), interactive activities, a statistics program, electronic versions of the problem sheets, and numerous other resources valuable as study, practice, and research tools. Of particular interest is the Learn More About feature, which contains a number of short audio excerpts in which the authors discuss various aspects of research that go beyond what they present in the text, often with interesting and amusing examples.

 The Online Learning Center at www.mhhe.com/fraenkel5e houses the student study guide, Web links, and other Internet resources.

 The Student Workbook contains several practice exercises per chapter, as well as hard copies of the problem sheets.

INSTRUCTOR SUPPLEMENTS

The Instructor's Manual and Test Bank has been revised. A dual platform CD-ROM test bank is available for test construction. New to this edition is an Instructor's Resource CD-ROM that includes the Instructor's Manual and Test Bank, and PowerPoint slides developed for the text. The Instructor's Online Learning Center houses a wealth of resources for the instructor.

ACKNOWLEDGMENTS

Directly and indirectly, many people have contributed to the preparation of this book. We will begin by acknowledging the students in our research classes who, over the years, have taught us much. Also, we wish to thank the reviewers of this edition, whose generous comments have guided the preparation of this text. They include:

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Finally, we would like to thank our wives for their unflagging support during the highs and lows that inevitably accompany the preparation of a text of this magnitude.

Jack R. Fraenkel
Norman E. Wallen

A Guided Tour of How to Design and Evaluate Research in Education

Welcome to *How to Design and Evaluate Research in Education*.

This comprehensive introduction to research methods was designed to present the basics of educational research in as interesting and understandable a way as possible. To accomplish this, we've created the following features for each chapter.

Opening Illustration

Each chapter opens with an illustrative depiction of a key concept that will be covered in the chapter.

Validity and Reliability

CHAPTER 8



Graphic Organizer

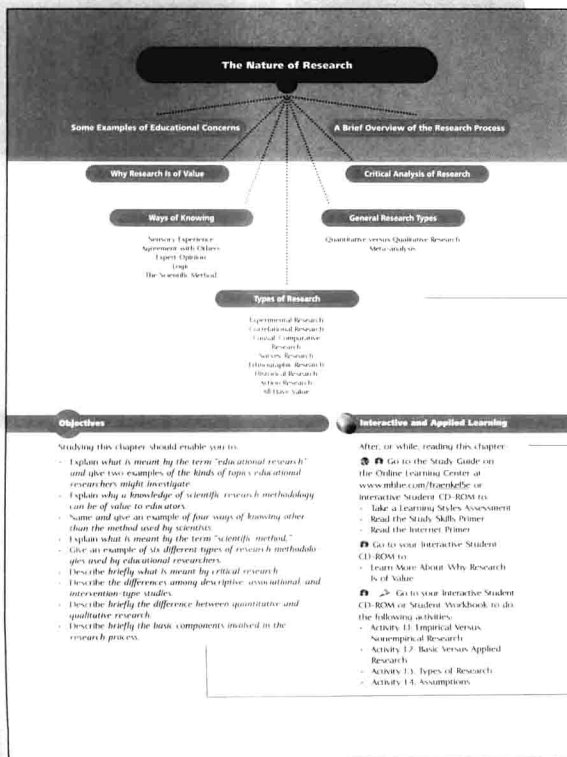
Next, a graphic outline lists the chapter topics to follow.

Interactive and Applied Learning Tools

This special feature lists the practice activities and resources related to the chapter that are available in the student supplements.

Objectives

Chapter objectives prepare the student for the chapter ahead.



Marge Jenkins and Jenna Rodriguez are having coffee following the meeting of their graduate seminar in educational research. Both are puzzled by some of the ideas that came up in today's meeting of the class.

"I'm not sure I agree with Ms. Naser (their instructor)," says Jenna. "She said that there are a lot of advantages to predicting how you think a study will come out."

"Yeah, I know," replies Marge. "But formulating a hypothesis seems like a good idea to me."

"Well, perhaps, but there are some disadvantages, too."

"Really? I can't think of any."

"Well, what about . . . ?"

Actually, both Jenna and Marge are correct. There are both advantages and disadvantages to stating a hypothesis in addition to one's research question. Examples of both are one of the things we'll discuss in this chapter.

Chapter-Opening Example

The chapter text begins with a practical example—a dialogue between researchers or a peek into a classroom—related to the content to follow.

More About Research

These boxes take a closer look at important topics in educational research. See a full listing of these boxes, starting on page vii.



More about Research

The Difficulty in Generalizing from a Sample

In 1936, the *Literary Digest*, a popular magazine of the time, selected a sample of voters in the United States and asked the individuals in the sample for whom they would vote in the upcoming presidential election—Alf Landon (Republican) or Franklin Roosevelt (Democrat). The magazine editors obtained a sample of 2,375,000 individuals from lists of automobile and telephone owners in the United States (about 20 percent returned the mailed postcards). On the basis of their findings, the editors predicted that Landon would win by a landslide. In fact, it was Roosevelt who won the landslide victory. What was wrong with the study?

Certainly not the size of the sample. The most frequent explanations have been that the data were collected too far

ahead of the election and that a lot of people changed their minds, and/or that the sample of voters was heavily biased in favor of the more affluent, and/or that the 20 percent return rate introduced a major bias. What do you think?

A misconception that is common among beginning researchers is illustrated by the following statement: "Although I obtained a random sample only from schools in San Francisco, I am entitled to generalize my findings to the entire state of California because the San Francisco schools (and hence my sample) reflect a wide variety of socioeconomic levels, ethnic groups, and teaching styles." The statement is incorrect because variety is not the same thing as representativeness. In order for the San Francisco schools to be representative of all the schools in California, they must be very similar (ideally, identical) with respect to characteristics such as the ones mentioned. Ask yourself: "Are the San Francisco schools representative of the entire state with regard to ethnic composition of students?" The answer, of course, is that they are not.



Research Tips

Sample Size

Students frequently ask for more specific rules on sample size. Unfortunately, there are no simple answers. However, under certain conditions, some guidelines are available:

Value of sample r	.05	.10	.15	.20	.25	.30	.40	.50
Sample size required	1539	400	177	100	64	49	25	16

Sample size required for concluding that a difference in sample means is statistically significant (i.e., the difference between the means of the two populations is not zero) at the .05 level of confidence. These calculations require that the population standard deviation be known or estimated from the sample standard deviations. Let us assume, for example, that the standard deviation in both populations is 15 and each of the samples is the same size.

Difference between the sample means	2 points	5 points	10 points	15 points
Required size of each sample	434	71	18	8

The most important condition is random sampling, but there are other specific requirements that are discussed in statistics texts. Assuming these assumptions are met, the following apply:

Sample size required for concluding that a sample correlation coefficient is statistically significant (i.e., different from zero in the population) at the .05 level of confidence:

Research Tips

These boxes provide practical pointers for doing research. See a full listing of these boxes on page vii.

Controversies in Research

These boxes highlight a controversy in research to provide you with a greater understanding of the issue. See a full listing of these boxes on page viii.



Controversies in Research

High-Stakes Testing

High-stakes testing refers to the use of tests (often only a single achievement test) as the primary, or only basis for decisions having major consequences. For students, such consequences include retention in grade and/or the denial of diplomas and awards. For schools, they include public praise or condemnation, sanctions, and financial rewards or punishments. "In state after state, legislatures, governors, and state boards, supported by business leaders, have imposed tougher requirements in mathematics, English, science, and other fields, together with new tests by which the performance of both students and schools is to be judged."⁸

For years, tests had been used as one indicator of performance, what was new was exclusive reliance on them. "The backlash, louding virtually every state that has instituted high-stakes testing, arises from a spectrum of complaints. A major complaint is that the focus on testing and obsessive test preparation, sometimes beginning in kindergarten, is killing innovative teaching and curricula and driving out good teachers. Other complaints are that (conversely) the standards on which the tests are based are too vague and that students have not been taught the material on which the tests are based. Or that the tests are unfair to poor and minority students; or to those who lack test-taking skills; or that the tests put too much stress on young children. And some argue that they are too long (in Massachusetts they

can take up to 13 hours!) or too tough or simply not good enough."⁹

In response, the American Educational Research Association developed a position statement of "conditions essential to sound implementation of high-stakes educational testing programs."¹⁰ It contained 14 specific points. 4 of the most important being that such decisions about students should not be based on test scores alone; tests should be made fairer to all students; tests should match the curriculum; and that the reliability and validity of tests should continually be evaluated.

Two examples of responses to the guidelines were the following:

- "In the face of too much testing with far too severe consequences, the AERA positions, if implemented, would be a step forward relative to current practice."¹¹
- "The statement reflects what is desired for all state tests and assessments. But, just as all students have not yet met the standards, not all state tests and assessments will immediately meet the goals contained in this statement."¹²

What do you think? Are the complaints about high-stakes tests warranted?

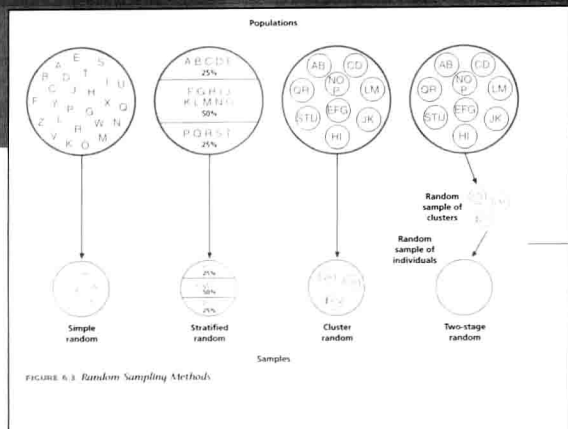
⁸Ibid.

⁹American Educational Research Association (2000). Position statement of the American Educational Research Association concerning high-stakes testing in pre-12 education. (2000). *Educational Researcher*, 26 (11), 24-35.

¹⁰M. Neill (2000). Quoted in Initial responses to AERA's position statement concerning high-stakes testing. *Educational Researcher*, 26(11), 28.

¹¹W. Martin (2000). Quoted in Ibid., p. 27.

¹²P. Scheng (2000). High stakes are for tomorrow. *Atlantic Monthly*, 286(August), 19.



Figures and Tables

Numerous figures and tables explain or extend concepts presented in the text.

Research Reports

Published research reports are included at the conclusion of methodology chapters. The reports have been annotated to provide excellent and practical examples.

Research Report

Effects of Cooperative Learning Among Hispanic Students in Elementary Social Studies

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Gene R. Roze
Mary Tallent-Runnels
Boise State University, Boise, Idaho

Abstract

Although research has indicated that cooperative learning enhances student achievement, promotes self-esteem, and improves interpersonal relations, few studies have focused on cooperative learning in elementary social studies. This study examined the effects of cooperative learning on the social studies achievement and self-esteem of Hispanic fourth-grade students who received instruction using cooperative learning or traditional instruction. Results indicate that cooperative learning had a positive effect on social studies achievement, self-esteem, and interpersonal relations. Although self-esteem was significantly higher for boys than for girls, regardless of treatment, this result was not consistent. Making connections between social studies goals and cooperative learning offers a valuable tool for improving social studies education.

During the past 15 years, research has indicated that cooperative learning groups enhance student achievement (Kagan & Johnson, 1987; Slavin, 1990, 1991; Webb, 1988). Peer interaction is central to the success of cooperative learning as it relates to cognitive understanding. Cognitive developmental theories such as Vygotsky's (1978) emphasize that individual growth is dynamic social interaction process. As has been noted, especially when it involves explanation, often leads to cognitive restructuring and an increase in understanding. Cooperation is facilitated in learners, some of whom might normally "hide out" or refuse to speak out in a traditional setting, become actively involved in the learning process through group interaction. According to Tallent-Runnels (1992), many cooperative learning studies when used appropriately (a) provide students with a sense of the task, motivation of task, and learning lower level skills; in addition to these aims, however, cooperative learning has been found to promote self-esteem, interpersonal relations, and improved attitudes toward school and peers. In a comparison study, Slavin (1988) found that cooperative learning was not superior to all comparison; they did not improve interpersonal competition (Johnson & Johnson, 1983). Other cooperative learning models, such as Jigsaw, Bussanese, and Kagan, build a competitive phase into part of the instructional strategy (Hall & Slavin, 1992). Inappropriate competition, however, tends to divert the learning effect from social studies, academic knowledge and abilities, which in turn, can create negative perceptions of differences on the basis of gender, race, or ethnicity (Slavin, 1992).

Chapter 12 Experimental Research 291

Cooperative learning groups have also been found to equalize the status and respect of all group members, regardless of gender (Cotton, 1989; Johnson, Johnson, & Marne, 1988). Research by Olson (1985) revealed that competitively structured classrooms have the effect of favoring boys or reinforcing sex role stereotypes that may limit opportunities for girls. Studies in traditional classrooms have consistently shown that boys have more interactions with teachers than girls do (Bishop & Good, 1974; Cooper & Good, 1983) and that in our culture boys are of ten socialized to be assertive and demanding, whereas girls are to be responsible and compliant. In a comprehensive study, Martinez & Dukes (1991) on self-esteem and ethnicity among students in Grades 7 through 12 (N = 13,489), females and males generally reported lower levels of self-esteem than White males did. Within each race or ethnic category, satisfaction with self as a person for girls were lower than those for boys. A particularly interesting finding regarding satisfaction with self was that male Hispanics reported the highest satisfaction of any ethnic group, including White males.

PURPOSE

There have been numerous impacts of studies that confirm cooperative learning to be an effective way to structure learning activities (Johnson, Johnson, & Marne, 1988; Montague & Turner, 1987; Slavin, 1991). However, there is surprisingly little research that emphasizes on self-esteem and even less that focuses on social studies at the elementary level. Furthermore, no studies of which we are aware have investigated the effects of cooperative learning and the interaction of gender on social studies and self-esteem at the fourth-grade level in a Hispanic, low socioeconomic population. Thus, our purpose in the present study was to determine differences between the social studies achievement and self-esteem of Hispanic, economically disadvantaged, fourth-grade male and female students who participated in cooperative learning groups and those who received instruction using a traditional approach. Therefore, we addressed the following questions in this study:

1. Is there a difference in the social studies achievement/self-esteem of fourth-grade students according to the treatment of cooperative learning or traditional instruction and according to gender across treatment groups?
2. Is there a difference in the social studies achievement/self-esteem of fourth-grade students according to the treatment of cooperative learning or traditional instruction and according to gender across treatment groups?

METHOD

Participants

This 12-week study was conducted in eight fourth-grade social studies classrooms (N = 105) in two elementary schools in the Southwest with low socioeconomic Hispanic population. The percentages of the student populations receiving free or reduced lunches were 28% free and 10% reduced at school A and 88% free and 5% reduced at school B. Twenty-four boys and 26 girls received instruction based on cooperative learning; 24 boys and 10 girls received traditional teacher-directed instruction. School district administrators assigned the research study to eight fourth-grade classrooms at two elementary schools. Two classes of each treatment group were represented at each school. Teachers were randomly assigned by the researchers to the cooperative learning treatment groups. They had received training in cooperative learning group strategies through Johnson and Johnson, Brown Book, workshops, consultation with the research sample teachers, and supplemental materials. Teachers using the traditional approach also had experience in cooperative learning methodology but agreed to teach the content in a whole class, teacher-centered teacher-directed format. All of the female teachers were Hispanic and

Analysis of the Study

PURPOSE/JUSTIFICATION

The purpose of this study is partly clear at the outset. To study the effects of cooperative learning with Hispanic students in elementary social studies. Under "Purpose," we learn that the students are economically disadvantaged fourth graders. It is clear in the introduction that the effects studied are social studies achievement (as limited as unit tests) and self-esteem. The introduction is actually a summary of prior research; reviews several empirical and theoretical justifications for studying cooperative learning and for the position that it improves achievement and self-esteem. We think this one could be made more forcefully and that it is especially weakened by the frequent use of the words "and" and "thus." Since the question is not whether these effects can occur but whether they do. The major justification for this study is that there appears to have been few studies based on elementary social studies and none focused on the effects relative to gender with fourth-grade, low-income Hispanic students. While this kind of justification is common—that is, using a group that hasn't been studied yet—it is nevertheless weak. Why is it important to study this method and these outcomes with this group?

Probably little justification is needed for studying achievement since this is presumably what checks are primarily about. Self-esteem is more controversial, being viewed by some as a fuzzy-minded bull. Citation in the introduction provides a beginning justification for looking at gender and ethnicity in relation to self-esteem that could be connected to the prior arguments that were made for cooperative learning. It may have seemed obvious to the authors why it is important to find out whether cooperative learning improves achievement and self-esteem, and particularly for girls, but their report would be greatly strengthened by spelling it out. The assertion in the abstract that there is a close affinity between the goals of citizenship education and social skills promoted by cooperative learning is not obvious and requires explanation. There appear to be no ethical issues involving confidentiality, risk, or deception.

DEFINITIONS

Specific definitions, as such, are not provided, so to be sure they should be. Cooperative learning is defined by descriptions of what occurred during the study.

"Brown Book Training." Ignesa H. Group investigation that are not likely to be familiar to the general readership of the *Journal of Educational Research*. Further description provides a pretty good idea of what occurred and is consistent with most definitions of cooperative learning. Description of the traditional classroom serves to clarify further the differences between the two methods.

"Social studies achievement is operationally defined (by implication as the score on criterion-referenced unit tests based on two specified units on Texas history published by Scott, Foresman ("Setting Our State" and "A Changing Texas"). The reader is provided with little help in assessing what is considered achievement in this context. Self-esteem is also defined operationally, as a score on the Coopersmith Self-Esteem Inventory. Once again, a reader unfamiliar with this scale is given little help in defining self-esteem. Inclusion of the definition that accompanies the manual for this scale would be helpful.

PRIOR RESEARCH

As mentioned under "Purpose," the review of general literature on cooperative learning appears to be adequate, and a justification for studying cooperative learning as a means of enhancing the self-esteem of Hispanic girls can be inferred. We object to the description of higher self-esteem reported by Hispanic males as "interesting" without discussion of its meaning or importance.

HYPOTHESES

Although not stated—and we think they should be—two directional hypotheses seem clearly implied in the two questions that are stated. They are:

- When compared to traditional instruction, cooperative learning will result in greater gains in achievement and self-esteem.
- The gains under cooperative learning, as compared to traditional instruction, will be greater for girls than for boys.

SAMPLE

As is common unfortunately, a convenience sample was used. Description of students is limited to gender, breakdown and income level (free and reduced-cost lunches). It is unclear whether income applies to all sites.

Each research report is critiqued by the authors, with both its strengths and weaknesses discussed.

Chapter Review

The chapter ends with a listing of the review resources available for the student in the student study guide located on the Online Learning Center and on the Interactive Student CD-ROM.

Main Points

Bulleted main points highlight the key concepts of the chapter.

Go back to the *Interactive and Applied Learning Tools* feature at the beginning of the chapter for a listing of *interactive and applied activities*. Go to the *Online Learning Center* at www.mhhe.com/learnit4u or your *Interactive Student CD-ROM* to take practice quizzes and receive immediate feedback, practice with key terms, review chapter content and main ideas, and find annotated Web links.

THE VALUE OF A LITERATURE REVIEW

- A literature review helps researchers learn what others have written about a topic. It also lets researchers see what have been the results of other, related studies.
- A detailed literature review is often required of master's and doctoral students when they design a thesis.

TYPE OF SOURCES FOR A LITERATURE REVIEW

- Researchers need to be familiar with three basic types of sources: (1) general references, primary sources, and secondary sources in doing a literature review.
- General references are sources a researcher consults to locate other sources.
- Primary sources are publications in which researchers report the results of their investigations. Most primary source material is located in journal articles.
- Secondary sources refer to publications in which authors describe the work of others. *Educational Index* and *CIE* are two of the most frequently used general references in educational research.
- Search terms, or "descriptors" are key words researchers use to help locate relevant primary sources.

STEPS INVOLVED IN A LITERATURE SEARCH

- The essential steps involved in a review of the literature include: (1) defining the research problem as precisely as possible; (2) perusing the secondary sources; (3) selecting and perusing an appropriate general reference; (4) formulating search terms; (5) searching the general references for relevant primary sources; (6) obtaining and reading the primary sources, and noting and summarizing key points in the sources.

WAYS TO DO A LITERATURE SEARCH

- Today, there are two main ways to do a literature search—manually, using the traditional paper approach, and electronically, by means of a computer.
- There are five essential points (problem, hypotheses, procedures, findings, and conclusions) that researchers should record when taking notes on a study.

DOING A COMPUTER SEARCH

- Computer searches of the literature have a number of advantages—they are fast, are fairly inexpensive, provide printouts, and enable researchers to search using more than one descriptor at a time.
- The steps in a computer search are similar to those in a manual search, except much of the work is done by a computer.
- Researching the World Wide Web (WWW) should be considered, in addition to ERIC and PsycINFO, in doing a literature search.

Main Points

Key Terms

Abstract 71	Exceptional Child	Resources in Education
Bibliography 63	Education Resources	(RE) 73
Book on special 52	(ECER) 74	Search engine 84
Computer search 33	General reference 70	Search terms 75
Electronic 70	Interlibrary loan 78	Secondary source 70
Current Index to Journals	Keyword Index 74	Second Science Citation
in Education (CJIE) 73	Literature review 70	Index (SSCI) 72
Description 70	Manual search of the	Sociological Abstracts 71
Directory 64	literature 74	Spider 85
Hyperbion Abstracts	Meta-analysis 88	The World Wide Web
International	Primary source 70	(WWW) 84
(DAI) 70	Professional journal 77	Theses of ERIC
Education Index 72	PsycInfo 72	Directories 82
Educational Information	Psychological Abstracts 72	Web browser 84
Index (ERIC) 73	Reader's Guide to	Webcrawler 85
	Periodical Literature 72	

For Discussion

- Why might it be unwise for a researcher not to do a review of the literature before planning a study?
- Many published research articles include only a few references to related studies. How would you explain this? Is this justified?
- Which do you think are more important to emphasize in a literature review—the opinions of experts in the field or related studies? Why?
- Which of the secondary sources described in this chapter would be most appropriate to consult on the following topics?
 - Recent research on social studies education
 - A brief overview on new developments in science teaching
 - An extensive review of recent and past research on a particular research question
 - A survey of recent research on heterogeneous grouping
- One rarely finds books referred to in literature reviews. Why do you suppose this is so? Is it a good idea to refer to books?

Key Terms

Key terms are listed with page references.


For Discussion

End-of-chapter questions are designed for in-class discussion.

Research Exercise Three: The Research Hypothesis

Try to formulate one testable hypothesis involving a relationship. It should be related to the research question you developed in Research Exercise Two. Using Problem Sheet 3, state the hypothesis in a sentence or two. Check to see if it suggests a relationship between at least two variables. If it does not, revise it so that it does. Now name these variables, and then indicate which is the independent variable and which is the dependent variable. Last, list as many extraneous variables as you can think of that might affect the results of your study.

 An electronic version of this Problem Sheet that you can fill in and print, save as a .pdf, is available on the Online Learning Center at www.mhhe.com/haerthe and on your Interactive Student CD-ROM.

 A full-sized version of this Problem Sheet that you can fill in or photocopy is in your Student Workbook.

PROBLEM SHEET 3

The Research Hypothesis

- My research question is _____.
- I intend to use a hypothesis to investigate this question. Yes _____ No _____
- If so, my reasons are as follows: _____
- If so, my hypothesis is: _____
- This hypothesis suggests a relationship between at least two variables. They are _____ and _____
- More specifically, the variables in my study are:
 - Dependent _____
 - Independent _____
- The dependent variable is (check one): categorical _____ quantitative _____
- The independent variable is (check one): categorical _____ quantitative _____
- Possible extraneous variables that might affect my results include:
 - _____
 - _____
 - _____
 - _____
 - _____

Research Exercises

The research exercise explains how to fill in the Problem Sheet that follows.

Problem Sheets

Individually, the problem sheets allow the student to apply their understanding of the major concepts of each chapter. As a whole, they walk the student through each step of the research process.

List of Features

Research Reports

Effects of Cooperative Learning Among Hispanic Students in Elementary Social Studies 290

Effects of Choice Making on the Serious Problem Behaviors of Students with Severe Handicaps 321

The Relationship Between Time to Completion and Achievement on Multiple-Choice Items 354

Personal, Social, and Family Characteristics of Angry Students 378

Jobs, Careers, and Callings: People's Relations to Their Work 412

Why Students of Color Are Not Entering Teaching: Reflections from Minority Teachers 465

Student Teachers and Classroom Discipline 495

Dumping Ground or Effective Alternative? Dropout-Prevention Programs in Urban Schools 526

Lydia Ann Stow: Self-actualization in a Period of Transition 557

What Do You Mean "Think Before I Act"? Conflict Resolution with Choices 587



Research Tips

Key Terms to Define in a Research Study 32

What a Good Summary of a Journal Article Should Contain 79

Some Tips About Developing Your Own Instrument 125

Sample Size 241

How Not to Interview 462

Things to Consider When Doing In-School Research 585

Questions to Ask When Evaluating a Research Report 608



More About Research

Chaos Theory 8

The Importance of a Rationale 34

Some Important Relationships That Have Been Clarified by Educational Research 43

Patients Given Fake Blood Without Their Knowledge 61

An Example of Unethical Research 63

Department of Health and Human Services Revised Regulations for Research with Human Subjects 65

The Difficulty in Generalizing from a Sample 111

Checking Reliability and Validity—An Example 171

Threats to Internal Validity in Everyday Life 188

Some Thoughts About Meta-Analysis 190

Correlation in Everyday Life 219

Interpreting Statistics	262
Significant Findings in Experimental Research	288
Important Findings in Single-Subject Research	317
Examples of Studies Conducted Using Single-Subject Designs	319
Important Findings in Correlational Research	339
Significant Findings in Causal-Comparative Research	377
Important Findings in Survey Research	401
Important Findings in Content Analysis Research	484
Important Findings in Ethnographic Research	513
Important Findings in Historical Research	555
An Important Example of Action Research	580



Controversies in Research

Clinical Trials—Desirable or Not?	58
Ethical or Not?	64
Which Statistical Index Is Valid?	148
High-Stakes Testing	163
Is Consequential Validity a Useful Concept?	172
Can Statistical Power Analysis Be Misleading?	246
Statistical Inference Tests—Good or Bad?	257
Do Placebos Work?	278
How Should Research Methodologies Be Classified?	370
Is Low Response Rate Necessarily a Bad Thing?	410
Clarity and Postmodernism	435
Portraiture: Art, Science, or Both?	437
Should Historians Influence Policy?	554
How Much Should Participants Be Involved in Research?	576

List of Tables and Figures

Tables

Table 5.1 Some of the Major Indexing and Abstracting Services Used in Educational Research 74

Table 5.2 Major Directories on the World Wide Web 85

Table 5.3 Leading Search Engines 85

Table 6.1 Part of a Table of Random Numbers 99

Table 6.2 A Hypothetical Population of 99 Students 107

Table 6.3 Sample 1, Selected from the Population in Table 6.2 108

Table 6.4 Statistics of Sample 1, Compared to Population Parameters from Table 6.2 108

Table 6.5 Sample 2, Selected from the Population in Table 6.2 108

Table 6.6 Statistics of Samples 1 and 2 Compared to Population Parameters from Table 6.2 108

Table 6.7 Combined Sample Statistics Compared to Population Parameters from Table 6.2 108

Table 6.8 Samples 3 and 4, Selected from the Population in Table 6.2 109

Table 6.9 Combined Statistics for All Four Samples Compared to Population Parameters 109

Table 7.1 Hypothetical Example of Raw Scores and Accompanying Percentile Ranks 144

Table 7.2 Characteristics of the Four Types of Measurement Scales 147

Table 7.3 Hypothetical Results of Study Involving a Comparison of Two Counseling Methods 149

Table 8.1 Example of an Expectancy Table 164

Table 8.2 Methods of Checking Validity and Reliability 168

Table 9.1 General Techniques for Controlling Threats to Internal Validity 191

Table 10.1 Example of a Frequency Distribution 201

Table 10.2 Example of a Grouped Frequency Distribution 202

Table 10.3 Example of a Calculation of the Mode, Median, and Mean in a Distribution 205

Table 10.4 Yearly Salaries of Workers in a Small Business 206

Table 10.5 Calculation of the Standard Deviation of a Distribution 208

Table 10.6 Comparisons of Raw Scores and z Scores on Two Tests 210

Table 10.7 Data Used to Construct Scatterplot in Figure 10.16 214

Table 10.8 Frequency and Percentage of Total of Responses to Questionnaire 218

Table 10.9 Grade Level and Gender of Teachers (Hypothetical Data) 220