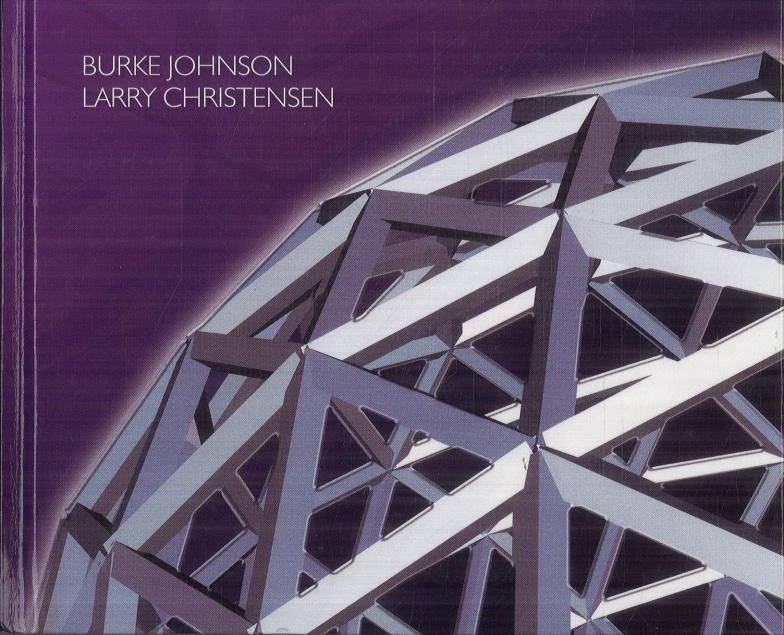
EDUCATIONAL RESEARCH Fourth Edition

Quantitative, Qualitative, and Mixed Approaches



DETAILED CONTENTS

Preface	XX
Acknowledgments	xxv
Part I: Introduction	1
Introduction to Educational Research	2
Why Study Educational Research? 4	
Areas of Educational Research 5	
Examples of Educational Research 7	
General Kinds of Research 9	•
Basic and Applied Research 9	•
Evaluation Research 10	
Action Research 11	
Orientational Research 12	
Sources of Knowledge 12	
Experience 13	
Reasoning 13	
The Scientific Approach to Knowledge Generation 14	
Dynamics of Science 15	
Basic Assumptions of Science 15 Scientific Methods 17	
Theory 18 The Principle of Evidence 20	
The Principle of Evidence 20 Objectives of Educational Research 21	
Overview of Book 25	
Summary 25	
Key Terms 26	
Discussion Questions 26	
Research Exercises 26	
Action Research Journaling 27	
Relevant Internet Sites 27	
Recommended Reading 28	

57 58 Sources of Research Ideas 60 Everyday Life 60 Practical Issues 60 Past Research 61 Theory 62 Ideas That Can't Be Resolved Through Empirical Research 63 Review of the Literature 64 Literature Review for Quantitative Research Studies 64 Literature Review for Qualitative Research Studies 65 Sources of Information 66 Conducting the Literature Search 67 Using Databases 67 Using the Public Internet 68 Feasibility of the Study 71 Statement of the Research Problem 71 Stating a Quantitative Research Problem 71 Stating a Qualitative Research Problem 72

	Statement of the Purpose of the Study 73	
	Statement of Purpose in a Quantitative Study 73	
	Statement of Purpose in a Qualitative Study 73	
	Statement of Research Questions 74	
	Statement of a Quantitative Research Question 74	
	Statement of a Qualitative Research Question 76	
	Formulating Hypotheses 76	
	Consumer Use of the Literature 78	
	Summary 82	
	Key Terms 83	
	Discussion Questions 83	
	Research Exercises 83	
	Action Research Journaling 83	
	Relevant Internet Sites 84	
	Recommended Reading 84	
4	and the second s	0.5
	How to Write a Research Proposal	85
	Framework of the Research Proposal 87	
	Strategies for Writing Each Section of the Research Proposal 87	
	Introduction 87	
	Method 89	
	Research Participants 90	
	Design 90	
	Apparatus and/or Instruments 91	
	Procedure 92	
	Data Analysis 93	
	Abstract 93	
	Summary 94	
	Key Terms 95	
	Discussion Questions 95	
	Research Exercise 95	
	Action Research Journaling 95	
	Relevant Internet Sites 95	
	Recommended Reading 96	
5		
	Research Ethics	97
	What Are Research Ethics? 99	
	Ethical Concerns 100	
	Relationship Between Society and Science 100	
	Professional Issues 101	
	Treatment of Research Participants 103	
	Ethical Guidelines for Research With Humans 106	
	Informed Consent 107	
	Informed Consent and Minors as Research Participants 110	
	Passive Versus Active Consent 112	
	Additional Consent 113	
	AUGUNDIA CONSCIE 112	

Protection From Mental and Physical Harm 115	116
Confidentiality, Anonymity, and the Concept of Privacy Institutional Review Board 117	110
Ethical Issues in Electronic Research 122	
Informed Consent and Internet Research 122	
Privacy and Internet Research 122	
Debriefing and Internet Research 123	
Ethical Issues in Preparing the Research Report 123	
Authorship 124	
Writing the Research Report 124	
Summary 125	
Key Terms 127	
Discussion Questions 127	
Research Exercises 127	
Action Research Journaling 128	
Relevant Internet Sites 128	
Recommended Reading 128	
U	
PART III: FOUNDATIONS OF RESEARCH	129
TART III. TOUNDATIONS OF RESEARCH	125
6	
Standardized Measurement and Assessment	130
Defining Measurement 132	
Scales of Measurement 132	
Nominal Scale 133	
Ordinal Scale 133	
Interval Scale 134	
Ratio Scale 135	
Assumptions Underlying Testing and Assessment 135	
Identifying a Good Test or Assessment Procedure 137	
Overview of Reliability and Validity 137	
Reliability 138	
Validity 143	
Using Reliability and Validity Information 149	
Educational and Psychological Tests 150	
Intelligence Tests 150	
Personality Tests 151 Educational Assessment Tests 152	
Sources of Information About Tests 155	
Summary 156	
Key Terms 157 Discussion Questions 157	
Discussion Questions 157 Research Exercises 158	
Exercise Sheet 158	

Deception 114

Freedom to Withdraw 115

Action Research Journaling 159

How to Construct a Questionnaire

161

What Is a Questionnaire? 162

Principles of Questionnaire Construction 163

Principle 1. Make sure the questionnaire items match your research objectives. 165

Principle 2. Understand your research participants. 165

Principle 3. Use natural and familiar language. 165

Principle 4. Write items that are clear, precise, and relatively short. 160

Principle 5. Do not use "leading" or "loaded" questions. 166

Principle 6. Avoid double-barreled questions. 168

Principle 7. Avoid double negatives. 168

Principle 8. Determine whether an open-ended or

a closed-ended question is needed. 169

Principle 9. Use mutually exclusive and exhaustive response categories for closed-ended questions. 170

Principle 10. Consider the different types of response categories available for closed-ended questionnaire items. 172

Principle 11. Use multiple items to measure abstract constructs. 178

Principle 12. Consider using multiple methods when measuring abstract constructs. 179

Principle 13. Use caution if you reverse the wording in some of the items to prevent response sets in multi-item scales. 179

Principle 14. Develop a questionnaire that is properly organized and easy for the participant to use. 180

Principle 15. Always pilot test your questionnaire. 183

Putting It All Together 184

Summary 190

Key Terms 190

Research Exercises 190

Action Research Journaling 191

Relevant Internet Sites 191

Recommended Reading 192

Notes 192

8

Methods of Data Collection

193

Tests 197

Questionnaires 197

Interviews 198

Quantitative Interviews 199

Qualitative Interviews 202

Focus Groups 204

Observation 206

Quantitative Observation 206	
Qualitative Observation 207	
Visual Data 211	
Secondary or Existing Data 212	
Summary 213	
Key Terms 213	
Discussion Questions 213	
Research Exercises 214	
Action Research Journaling 214	
Relevant Internet Site 214	
Recommended Reading 214	
Recommended Reading 214	
Sampling in Quantitative, Qualitative, and Mixed Research	215
Terminology Used in Sampling 217	
Random Sampling Techniques 219	
Simple Random Sampling 219	
Systematic Sampling 223	
Stratified Random Sampling 225	
Cluster Random Sampling 228	
Nonrandom Sampling Techniques 230	
Convenience Sampling 230	
Quota Sampling 230	
Purposive Sampling 231	
Snowball Sampling 231	
Random Selection and Random Assignment 232	
Determining the Sample Size When Random Sampling Is Used 233	
Sampling in Qualitative Research 235	
Sampling in Mixed Research 238	
ž v	
Summary 239	
Key Terms 240 Discussion Questions 240	
Research Exercises 241	
, 8	
Relevant Internet Sites 241	
Recommended Reading 242	
Notes 242	
10	
Validity of Research Results in Quantitative,	
Qualitative, and Mixed Research	243
Validity Issues in the Design of Quantitative Research 245 Internal Validity 247	
Two Major Types of Causal Relationships 247 Criteria for Inferring Causation 248	
Threats to Internal Validity in Single-Group Designs 250	

	Threats to Internal Validity in Multigroup Designs 253		
	External Validity 256		
	Population Validity 257		
	Ecological Validity 259		
	Temporal Validity 260		
	Treatment Variation Validity 260		
	Outcome Validity 260		
	Construct Validity 261		
	Operationalism 261		
	Statistical Conclusion Validity 263		
	Research Validity (or "Trustworthiness") in Qualitative Research	264	
	Descriptive Validity 265		
	Interpretive Validity 265		
	Theoretical Validity 267		
	•		
	Internal Validity 268		
	External Validity 270		
	Research Validity (or "Legitimation") in Mixed Research 273		
	Summary 276		
	Key Terms 277		
	Discussion Questions 278		
	Research Exercises 278		
	Action Research Journaling 279		
	Relevant Internet Sites 279		
	Recommended Reading 279		
	Notes 280		
P ART	IV: Selecting a Research Method	28	31
	m t dip	2	82
	Experimental Research	2	οz
	The Experiment 284		
	Experimental Research Settings 284		
	<u>-</u>		
	Field Experiment 285		
	Field Experiment 285 Laboratory Experiment 285		
	Laboratory Experiment 285		
	Laboratory Experiment 285 Internet Experiment 285		
	Laboratory Experiment 285 Internet Experiment 285 Independent Variable Manipulation 286		
	Laboratory Experiment 285 Internet Experiment 285 Independent Variable Manipulation 286 Ways to Manipulate an Independent Variable 286		
	Laboratory Experiment 285 Internet Experiment 285 Independent Variable Manipulation 286 Ways to Manipulate an Independent Variable 286 Control of Confounding Variables 287		
	Laboratory Experiment 285 Internet Experiment 285 Independent Variable Manipulation 286 Ways to Manipulate an Independent Variable 286 Control of Confounding Variables 287 Random Assignment 288		
	Laboratory Experiment 285 Internet Experiment 285 Independent Variable Manipulation 286 Ways to Manipulate an Independent Variable 286 Control of Confounding Variables 287 Random Assignment 288 Matching 290		
	Laboratory Experiment 285 Internet Experiment 285 Independent Variable Manipulation 286 Ways to Manipulate an Independent Variable 286 Control of Confounding Variables 287 Random Assignment 288 Matching 290 Holding the Extraneous Variable Constant 292	292	
	Laboratory Experiment 285 Internet Experiment 285 Independent Variable Manipulation 286 Ways to Manipulate an Independent Variable 286 Control of Confounding Variables 287 Random Assignment 288 Matching 290 Holding the Extraneous Variable Constant 292 Building the Extraneous Variable Into the Research Design	292	
	Laboratory Experiment 285 Internet Experiment 285 Independent Variable Manipulation 286 Ways to Manipulate an Independent Variable 286 Control of Confounding Variables 287 Random Assignment 288 Matching 290 Holding the Extraneous Variable Constant 292 Building the Extraneous Variable Into the Research Design Analysis of Covariance 293	292	
	Laboratory Experiment 285 Internet Experiment 285 Independent Variable Manipulation 286 Ways to Manipulate an Independent Variable 286 Control of Confounding Variables 287 Random Assignment 288 Matching 290 Holding the Extraneous Variable Constant 292 Building the Extraneous Variable Into the Research Design Analysis of Covariance 293 Counterbalancing 293	292	
	Laboratory Experiment 285 Internet Experiment 285 Independent Variable Manipulation 286 Ways to Manipulate an Independent Variable 286 Control of Confounding Variables 287 Random Assignment 288 Matching 290 Holding the Extraneous Variable Constant 292 Building the Extraneous Variable Into the Research Design Analysis of Covariance 293	292	

	Strong Experimental Research Designs 300 Factorial Designs 306	
	Repeated-Measures Designs 310	
	Factorial Designs Based on a Mixed Model 312	
	Summary 313 Key Terms 314	
	Discussion Questions 315	
	Research Exercises 315	
	Action Research Journaling 316	
	Relevant Internet Sites 316	
	Recommended Reading 316	
	Notes 316	
12	Overal Franciscophal and Shorts G Designs	217
	Quasi-Experimental and Single-Case Designs	317
	Quasi-Experimental Research Designs 319	
	Nonequivalent Comparison-Group Design 320	
	Interrupted Time-Series Design 324	
	Regression-Discontinuity Design 328	
	Single-Case Experimental Designs 330	
	A-B-A and A-B-A-B Designs 331	
	Multiple-Baseline Design 334	
	Changing-Criterion Design 335	
	Methodological Considerations in Using Single-Case Designs 338	
	Summary 339	
	Key Terms 340	
	Discussion Questions 340	
	Research Exercises 341	
	Action Research Journaling 341	
	Relevant Internet Sites 341	
	Recommended Reading 342	
13	Nonexperimental Quantitative Research	343
	Steps in Nonexperimental Research 346	
	Independent Variables in Nonexperimental Research 346	
	Simple Cases of Causal-Comparative and Correlational Research 347	
	Three Required Conditions for Cause-and-Effect Relationships 350	
	Applying the Three Required Conditions for Causation in Nonexperimental Research 351	
	Techniques of Control in Nonexperimental Research (i.e., How to Design Strong	
	Nonexperimental Research) 355	
	Matching 355	
	Holding the Extraneous Variable Constant 357	
	Statistical Control 357	
	Interlude (The Study of Causal Relationships in Epidemiology) 359	

Classifying Nonexperimental Research by Time and Research Objective 360 The Time Dimension in Nonexperimental Research 361 Cross-Sectional Research 361 Longitudinal Research 362 Retrospective Research 365 The Research Objective Dimension in Nonexperimental Research Descriptive Nonexperimental Research 366 Predictive Nonexperimental Research 367 Explanatory Nonexperimental Research 368 Summary 372 Key Terms 372 Discussion Questions 372 Research Exercises 373 Action Research Journaling 373 Relevant Internet Sites 374 Recommended Reading 374 Notes 374 **Oualitative Research** Phenomenology 383 Examples of Phenomenology 384 Types of Phenomenology 385 Data Collection, Analysis, and Report Writing 386 Ethnography 389 The Idea of Culture 389 Examples of Ethnographic Research 390 Types of Ethnographic Research Data Collection, Analysis, and Report Writing 392 Case Study Research 395 What Is a Case? 395 Types of Case Study Research Designs 396 Data Collection, Analysis, and Report Writing 398 Grounded Theory 399 Characteristics of a Grounded Theory 400 Example of a Grounded Theory 401 Data Collection, Analysis, and Report Writing Summary 405 Key Terms 406 Discussion Questions 406 Research Exercises 406 Exercise Sheet 407 Action Research Journaling 407 Relevant Internet Sites 408 Recommended Reading 408

Notes 408

	5
_	

Historical Research

What Is Historical Research? 411 Significance of Historical Research 411 Historical Research Methodology 413 Identification of the Research Topic and Formulation of the Research Problem or Question 414 Data Collection or Literature Review 415 Documents and Other Written Records 415 Photographs 416 Relics 416 Oral Histories 416 How to Locate Historical Information 417 Primary Versus Secondary Sources 418 Evaluation of Historical Sources 418 External Criticism 419 Internal Criticism 419 Data Synthesis and Report Preparation 421 Summary 423 Key Terms 424 Discussion Questions 424 Research Exercises 425 Action Research Journaling 425 Relevant Internet Sites 425

Research Exercises 446

Recommended Reading 426

427

16 Mixed Research The Research Continuum 433 Types of Mixed Research Designs 434 Stages of the Mixed Research Process 437 Step 1. Determine whether a mixed design is appropriate. Step 2. Determine the rationale for using a mixed design. 439 Step 3. Select or construct the mixed research design and mixed sampling design. 440 Step 4. Collect the data. 441 Step 5. Analyze the data. 441 Step 6. Continually validate the data. 442 Step 7. Continually interpret the data and findings. 442 Step 8. Write the research report. 443 Limitations of Mixed Research 444 Summary 445 Key Terms 446 Discussion Questions 446

Action Research Journaling 447 Relevant Internet Sites 447 Recommended Reading 447

V: Analyzing the Data	
Descriptive Statistics	45
Descriptive Statistics 452	
Frequency Distributions 453	
Graphic Representations of Data 455	
Bar Graphs 455	
Histograms 455	
Line Graphs 455	
Scatter Plots 457	
Measures of Central Tendency 458	
Mode 458	
Median 459	
Mean 460	
A Comparison of the Mean, Median, and Mode 460	
Measures of Variability 463	
Range 464	
Variance and Standard Deviation 464	
Standard Deviation and the Normal Distribution 465	
Measures of Relative Standing 466	
Percentile Ranks 467	
z Scores 468	
Examining Relationships Among Variables 470	
Contingency Tables 470	
Regression Analysis 472	
Summary 476	
Key Terms 476	
Discussion Questions 476	
Research Exercises 477	
Action Research Journaling 477	
Relevant Internet Sites 478	
Recommended Reading 478	
Notes 478	
Inferential Statistics	4

Sampling Distributions 482
Sampling Distribution of the Mean 484
Estimation 486

Point Estimation 486

The Hypothesis-Testing Decision Matrix 499
Controlling the Risk of Errors 500
Hypothesis Testing in Practice 502
t Test for Independent Samples 503
One-Way Analysis of Variance 504
Post Hoc Tests in Analysis of Variance 505
t Test for Correlation Coefficients 506
t Test for Regression Coefficients 507
Chi-Square Test for Contingency Tables 508
Other Significance Tests 509
Summary 510
Key Terms 511
Discussion Questions 511
Research Exercises 512
Exercise Sheet 513
Action Research Journaling 513
Relevant Internet Sites 513
Recommended Reading 514
Notes 514
Data Analysis in Qualitative and Mixed Research
Data Analysis in Qualitative and Mixed Research
Interim Analysis 517
Interim Analysis 517 Memoing 518
Interim Analysis 517 Memoing 518 Analysis of Visual Data 518
Interim Analysis 517 Memoing 518 Analysis of Visual Data 518 Data Entry and Storage 520
Interim Analysis 517 Memoing 518 Analysis of Visual Data 518 Data Entry and Storage 520 Segmenting, Coding, and Developing Category Systems 520
Interim Analysis 517 Memoing 518 Analysis of Visual Data 518 Data Entry and Storage 520 Segmenting, Coding, and Developing Category Systems 520 Inductive and A Priori Codes 525
Interim Analysis 517 Memoing 518 Analysis of Visual Data 518 Data Entry and Storage 520 Segmenting, Coding, and Developing Category Systems 520 Inductive and A Priori Codes 525 Co-Occurring and Facesheet Codes 526
Interim Analysis 517 Memoing 518 Analysis of Visual Data 518 Data Entry and Storage 520 Segmenting, Coding, and Developing Category Systems 520 Inductive and A Priori Codes 525 Co-Occurring and Facesheet Codes 526 Enumeration 528
Interim Analysis 517 Memoing 518 Analysis of Visual Data 518 Data Entry and Storage 520 Segmenting, Coding, and Developing Category Systems 520 Inductive and A Priori Codes 525 Co-Occurring and Facesheet Codes 526 Enumeration 528 Creating Hierarchical Category Systems 528
Interim Analysis 517 Memoing 518 Analysis of Visual Data 518 Data Entry and Storage 520 Segmenting, Coding, and Developing Category Systems 520 Inductive and A Priori Codes 525 Co-Occurring and Facesheet Codes 526 Enumeration 528 Creating Hierarchical Category Systems 528 Identifying Relationships Among Categories 531
Interim Analysis 517 Memoing 518 Analysis of Visual Data 518 Data Entry and Storage 520 Segmenting, Coding, and Developing Category Systems 520 Inductive and A Priori Codes 525 Co-Occurring and Facesheet Codes 526 Enumeration 528 Creating Hierarchical Category Systems 528 Identifying Relationships Among Categories 531 Drawing Diagrams 534
Interim Analysis 517 Memoing 518 Analysis of Visual Data 518 Data Entry and Storage 520 Segmenting, Coding, and Developing Category Systems 520 Inductive and A Priori Codes 525 Co-Occurring and Facesheet Codes 526 Enumeration 528 Creating Hierarchical Category Systems 528 Identifying Relationships Among Categories 531 Drawing Diagrams 534 Corroborating and Validating Results 536
Interim Analysis 517 Memoing 518 Analysis of Visual Data 518 Data Entry and Storage 520 Segmenting, Coding, and Developing Category Systems 520 Inductive and A Priori Codes 525 Co-Occurring and Facesheet Codes 526 Enumeration 528 Creating Hierarchical Category Systems 528 Identifying Relationships Among Categories 531 Drawing Diagrams 534 Corroborating and Validating Results 536 Computer Programs for Qualitative Data Analysis 536
Interim Analysis 517 Memoing 518 Analysis of Visual Data 518 Data Entry and Storage 520 Segmenting, Coding, and Developing Category Systems 520 Inductive and A Priori Codes 525 Co-Occurring and Facesheet Codes 526 Enumeration 528 Creating Hierarchical Category Systems 528 Identifying Relationships Among Categories 531 Drawing Diagrams 534 Corroborating and Validating Results 536 Computer Programs for Qualitative Data Analysis 536 Data Analysis in Mixed Research 538
Interim Analysis 517 Memoing 518 Analysis of Visual Data 518 Data Entry and Storage 520 Segmenting, Coding, and Developing Category Systems 520 Inductive and A Priori Codes 525 Co-Occurring and Facesheet Codes 526 Enumeration 528 Creating Hierarchical Category Systems 528 Identifying Relationships Among Categories 531 Drawing Diagrams 534 Corroborating and Validating Results 536 Computer Programs for Qualitative Data Analysis 536 Data Analysis in Mixed Research 538 Mixed Analysis Matrix 538
Interim Analysis 517 Memoing 518 Analysis of Visual Data 518 Data Entry and Storage 520 Segmenting, Coding, and Developing Category Systems 520 Inductive and A Priori Codes 525 Co-Occurring and Facesheet Codes 526 Enumeration 528 Creating Hierarchical Category Systems 528 Identifying Relationships Among Categories 531 Drawing Diagrams 534 Corroborating and Validating Results 536 Computer Programs for Qualitative Data Analysis 536 Data Analysis in Mixed Research 538 Mixed Analysis Matrix 538 Analytical Procedures in Mixed Data Analysis 541
Interim Analysis 517 Memoing 518 Analysis of Visual Data 518 Data Entry and Storage 520 Segmenting, Coding, and Developing Category Systems 520 Inductive and A Priori Codes 525 Co-Occurring and Facesheet Codes 526 Enumeration 528 Creating Hierarchical Category Systems 528 Identifying Relationships Among Categories 531 Drawing Diagrams 534 Corroborating and Validating Results 536 Computer Programs for Qualitative Data Analysis 536 Data Analysis in Mixed Research 538 Mixed Analysis Matrix 538 Analytical Procedures in Mixed Data Analysis 541 Summary 542
Interim Analysis 517 Memoing 518 Analysis of Visual Data 518 Data Entry and Storage 520 Segmenting, Coding, and Developing Category Systems 520 Inductive and A Priori Codes 525 Co-Occurring and Facesheet Codes 526 Enumeration 528 Creating Hierarchical Category Systems 528 Identifying Relationships Among Categories 531 Drawing Diagrams 534 Corroborating and Validating Results 536 Computer Programs for Qualitative Data Analysis 536 Data Analysis in Mixed Research 538 Mixed Analysis Matrix 538 Analytical Procedures in Mixed Data Analysis 541

Interval Estimation 487

Null and Alternative Hypotheses 490 Directional Alternative Hypotheses 493

Examining the Probability Value and Making a Decision 494

Hypothesis Testing 489

T VI: WRITING THE RESEARCH REPORT	547
How to Prepare a Research Report and Use APA Style Guidelines	548
General Principles Related to Writing the Research Report 549 Language 550 Editorial Style 552 Reference List 556 Typing 557 Writing an APA-Style Quantitative Research Report 557 Title Page 557 Abstract 558 Introduction 558 Method 558 Results 559 Discussion 560 References 560 Footnotes 560 Tables 561 Figures 562 Example of an APA-Style Manuscript 562 Writing Qualitative Research Reports 574 Writing Mixed Research Reports 577 Key Term 578 Discussion Questions 578 Research Exercises 578 Action Research Journaling 579 Recommended Reading 580	
Note 580	581
Glossary References	598
ndex	609

Research Exercise 543
Exercise Sheet 544

About the Authors

Action Research Journaling 544 Relevant Internet Sites 544