Contents

PREFACE	
ON TEACHING Gaea Leinhardt	1
Approaching Inquiry About Teaching and Teachers 8 Strands of Teaching: A Strategy for Research 12 An Examination of Several Strands of Teaching 14 Speculations on the Teaching of Teaching 43 Conclusions 48	
LEARNING: THE MICROGENETIC ANALYSIS OF ONE STUDENT'S EVOLVING UNDERSTANDING OF A COMPLEX SUBJECT MATTER DOMAIN Alan H. Schoenfeld, John P. Smith III, and Abraham Arcavi	55
Background: Setting, Sessions, Method 62 The Evolution of the 3-Slot Schema 74 Sorting Out Slope 88 The Cartesian Connection 108	
	ON TEACHING Gaea Leinhardt Approaching Inquiry About Teaching and Teachers 8 Strands of Teaching: A Strategy for Research 12 An Examination of Several Strands of Teaching 14 Speculations on the Teaching of Teaching 43 Conclusions 48 LEARNING: THE MICROGENETIC ANALYSIS OF ONE STUDENT'S EVOLVING UNDERSTANDING OF A COMPLEX SUBJECT MATTER DOMAIN Alan H. Schoenfeld, John P. Smith III, and Abraham Arcavi Background: Setting, Sessions, Method 62 The Evolution of the 3-Slot Schema 74 Sorting Out Slope 88

343

SUBJECT INDEX

	Learning Y-Intercept 116 Discussion: Instructional and Theoretical Issues 129 Appendix A: Edited Transcript of Session 1 141 Appendix B: Selective Transcript of Session 2 163	
3	INTERMEDIATE CAUSAL MODELS: A MISSING LINK FOR SUCCESSFUL SCIENCE EDUCATION? Barbara Y. White	177
	Project 1: Understanding How Circuits Work 187 Project 2: Understanding Newtonian Mechanics 213 General Discussion 240 Summary 247	
4	ILLUSTRATIONS THAT INSTRUCT Richard E. Mayer	253
	How Illustrations Work: The Traditional and Cognitive Models of Learning From Text and Illustrations 260 Where Illustrations Work: Cognitive Functions of Effective Illustrations 265 When Illustrations Work: Cognitive Conditions for Effective Illustrations 273 Which Illustrations Work: Characteristics of Effective and Ineffective Illustrations 276 Summary 279	
5	THE DEVELOPMENT OF MEMORY AND REASONING SKILL IN ARGUMENTATIVE CONTEXTS: EVALUATING, EXPLAINING, AND GENERATING EVIDENCE Nancy L. Stein and Christopher A. Miller	285
	Issues Underlying the Study of Argument 287 The Definition of Argument 290 The Representation and Organization of Argument Knowledge 298 The Development of Argumentative Understanding and Reasoning Skill 302 Decision Making and Argumentative Reasoning 306 Conclusions and General Discussions 325	
Α.	UTHOR INDEX	337