## Contents

**Preface**  
page ix  

**Contributors**  
xiii  

1. Introduction to Multimedia Learning  
Richard E. Mayer  
1  

### PART I  
THEORETICAL FOUNDATIONS  

2. Implications of Cognitive Load Theory for Multimedia Learning  
John Sweller  
19  

3. Cognitive Theory of Multimedia Learning  
Richard E. Mayer  
31  

4. An Integrated Model of Text and Picture Comprehension  
Wolfgang Schnotz  
49  

5. The Four-Component Instructional Design Model: Multimedia Principles in Environments for Complex Learning  
Jeroen J. G. van Merriënboer  
Liesbeth Kester  
71
PART II
BASIC PRINCIPLES OF MULTIMEDIA LEARNING

6. Five Common but Questionable Principles of Multimedia Learning
   Richard E. Clark
   David F. Feldon

7. The Multimedia Principle
   J. D. Fletcher
   Sigmund Tobias

8. The Split-Attention Principle in Multimedia Learning
   Paul Ayres
   John Sweller

9. The Modality Principle in Multimedia Learning
   Renae Low
   John Sweller

10. The Redundancy Principle in Multimedia Learning
    John Sweller

    Richard E. Mayer

    Richard E. Mayer

    Richard E. Mayer

PART III
ADVANCED PRINCIPLES OF MULTIMEDIA LEARNING

14. The Guided Discovery Principle in Multimedia Learning
    Ton de Jong

15. The Worked-Out Examples Principle in Multimedia Learning
    Alexander Renkl

16. The Collaboration Principle in Multimedia Learning
    David H. Jonassen
    Chwee Beng Lee
    Chia-Chi Yang
    James Laffey
17. The Self-Explanation Principle in Multimedia Learning  
   Marguerite Roy  
   Michele T. H. Chi

18. The Animation and Interactivity Principles in Multimedia Learning  
   Mireille Betrancourt

19. Navigational Principles in Multimedia Learning  
   Jean-Francois Rouet  
   Hervé Potelle

20. The Site Map Principle in Multimedia Learning  
   Amy M. Shapiro

21. Prior Knowledge Principle in Multimedia Learning  
   Slava Kalyuga

22. The Cognitive Aging Principle in Multimedia Learning  
   Fred Paas  
   Pascal W. M. Van Gerven  
   Huib K. Tabbers

PART IV  
MULTIMEDIA LEARNING IN CONTENT AREAS

23. Multimedia Learning of Reading  
   David Reinking

24. Multimedia Learning of History  
   Jennifer Wiley  
   Ivan K. Ash

25. Multimedia Learning of Mathematics  
   Robert K. Atkinson

26. Multimedia Learning of Chemistry  
   Robert Kozma  
   Joel Russell

27. Multimedia Learning of Meteorology  
   Richard K. Lowe

28. Multimedia Learning About Physical Systems  
   Mary Hegarty

29. Multimedia Learning in Second Language Acquisition  
   Jan L. Plass  
   Linda C. Jones

30. Multimedia Learning of Cognitive Skills  
   Susanne P. Lajoie  
   Carlos Nakamura
PART V
MULTIMEDIA LEARNING IN ADVANCED COMPUTER-BASED CONTEXTS

31. Multimedia Learning with Animated Pedagogical Agents
   Roxana Moreno
   507

32. Multimedia Learning in Virtual Reality
   Sue Cobb
   Danaï Stanton Fraser
   525

33. Multimedia Learning in Games, Simulations, and Microworlds
   Lloyd P. Rieber
   549

34. Multimedia Learning with Hypermedia
   Andrew Dillon
   Jennifer Jobst
   569

35. Multimedia Learning in e-Courses
   Ruth Colvin Clark
   589

Author Index
617

Subject Index
635