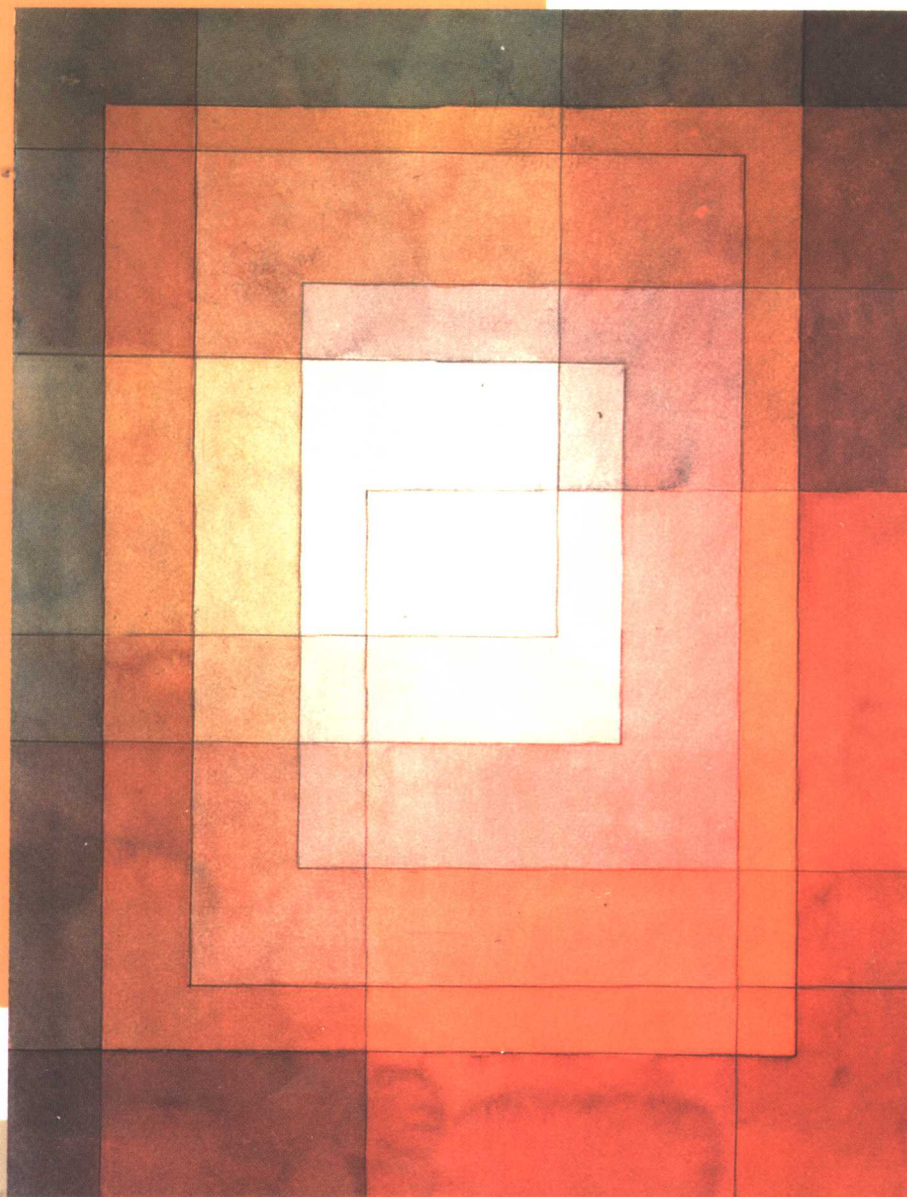


Educational Psychology

Windows on Teaching



Thomas K.
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PREFACE

Welcome to the revolution. This text is your field guide to the revolution. It's your tool to get the information you want—the way you want it—from a perspective that fits your course.

Revolutionary Perspective

Three decades ago, cognitive psychologists created a major revolution in psychology. They began to pursue the question, "How does the mind work?" The emphasis shifted from the study of behavior to the study of thinking. Psychologists now ask, "How do people *construct* knowledge?" The cognitive approach now dominates educational psychology, but it is not the only way to look at the field. Although this text emphasizes the cognitive approach, it also thoroughly covers all major approaches to educational psychology.

With its strong cognitive orientation, our book includes coverage of Vygotsky, information processing theory, and culture and language to emphasize the most compelling and current issues in educational psychology. We use examples of real situations to highlight practical application of these topics.

The Book

This text emphasizes the role of teachers as decision makers. Our goal is to prepare future teachers to be competent professionals who are well grounded in the principles of educational psychology and are ready to use this knowledge in their careers. How does our text do this?

We believe that a textbook is worthless if students feel intimidated or overwhelmed by the material in the book. An **easily accessible and understandable presentation** is a high priority. We deliberately use a style of language that is easy to understand and that makes even abstract ideas comprehensible.

The text provides comprehensive and **up-to-date coverage of the relevant topics in educational psychology**, including some topics (such as language development, information processing theory, and creativity) that others don't thoroughly address.

The book primarily follows a **cognitive approach**, reflecting the cognitive revolution in the field of educational psychology. We feel it is important to represent the other paradigms in the field (e.g., behaviorism, humanism), too, so prospective teachers know the many

ways of understanding students and their development. The cognitive approach, currently the dominant school of thought in the field, provides a conceptual framework for future teachers to (1) organize the material in this book in a meaningful way, (2) understand more easily their subsequent study of teaching methods, and (3) enhance their effectiveness as classroom teachers.

We believe that future teachers need to know about topics that are not directly within the scope of cognitive science, but that have direct bearing on their future careers as teachers. To meet this need, we include traditional topics within educational psychology, including **social and emotional development, classroom management, motivation, and measurement**, which we consider essential to teacher preparation.

We firmly believe that an educational psychology textbook should demonstrate the **classroom applications of theory and research**. We do this through examples and discussion of practical issues throughout the text. Applications are not limited to boxed inserts—you will find them within the text, flagged by icons.

Teachers Roundtables appear throughout the textbook to help students relate their learning to real world situations they will face. This feature presents excerpts of conversations among a small group of teachers, giving students an opportunity to hear these topics discussed in teachers' own voices. Participants in the Teachers Roundtable include early childhood, elementary, and secondary teachers, and at least one special educator.

U.S. teachers are serving an increasingly heterogeneous population of students, but many feel poorly prepared to do so. **Diversity Makes a Difference** boxes address specific topics in educational psychology as they relate to multiculturalism. For example, the assessment chapter has a boxed insert on the cultural bias inherent in standardized tests. In the language development chapter, the boxed insert is about how nonverbal communication differs among different cultural groups. We believe boxed inserts highlight not only the content but the importance of the topic of multiculturalism for future teachers.

A growing trend is the **inclusion** of all students with various disabilities in regular early childhood, elementary, and secondary settings where future teachers will work. Our book addresses issues that relate to inclusion throughout the text, and we emphasize similarities rather than differences between nondisabled students and those with disabilities.

Educational Psychology: Windows on Teaching has five sections. The first section, *Introduction to Educational Psychology*, includes the introductory chapter and one on learning as a major focus of educational psychology. These chapters provide the necessary background information for understanding educational psychology as it exists today.

The second section, *Cognitive Processes*, describes how recent theories of cognition have altered the way psychologists and educators conceptualize the mind and study how it works. It includes chapters on the cognitive-developmental model; information-processing theory; culture and language; knowledge and comprehension; and problem solving, decision making, and critical thinking.

The third section, *Learner Characteristics*, focuses on important student characteristics that affect learning, such as intelligence, creativity, social and emotional development, motivation, and learning difficulties.

The fourth section, *Shaping the Learning Environment*, examines the context in which learning and teaching take place: the classroom. This section explains how to plan for instruction, assess and evaluate students, manage the classroom, and teach effectively.

Text Features

Each chapter opens with an **outline**, **learning objectives**, and **preview** to alert readers to important concepts. All **key terms** are highlighted in the text and defined in the comprehensive glossary. Each chapter ends with a list of the chapter's **key points**, **self-study exercises**, **suggested further readings**, and a list of **references**. Each chapter also contains features that appear in the text page margin, and boxed features.

Features in the Margin

These features in the margin will help students maximize their learning:

A+ icons highlight teaching applications of educational psychology principles.

Learning objectives with icons show exactly where the text addresses each learning objective.

Marginal notes provide students additional information, and encourage students to reflect on educational psychology concepts and apply them to their own experiences.

Annual Edition: Educational Psychology icons highlight areas of the text that relate to articles in Annual Editions.

Boxed Features

Windows on Teaching provide students with practical ways to use principles of educational psychology in classroom teaching.

Diversity Makes a Difference describes ways that student ethnic diversity impacts classroom teaching.

Teachers Roundtables contain teachers' thoughts on issues in their own voices.

Additional Items

Student Study Guide by Mina Berkowitz, Ph.D. Mina worked closely with us by contributing to the text and creating a study guide that reinforces the cognitive perspective of the text. The guide includes case studies with special questions for students. Chapter features are outline, key terms, comprehension check, critical thinking and application questions, final self-test, and answer key.

Guide to the Internet: Educational Psychology is a truly revolutionary resource! This guide introduces the Internet, explains terminology, then helps users explore the most valuable educational psychology resources on the net. Links described in the guide are accessible through the Brown & Benchmark Educational Psychology home page for point-and-click access to the best education and educational psychology sites. The guide is valuable for all skill levels, from web neophytes to web whizzes.

Brown & Benchmark Educational Psychology Home Page links you and your students to the best education and educational psychology sites on the web. Special features include **What's New**, **Internet Resources for Educators**, and more! Explore our home page at <http://www.bbp.com/edpsych.html>, or visit the Brown & Benchmark site at <http://www.bbp.com> to see what we're doing on the web right now.

Acknowledgments

We acknowledge the contributions of our editor, Sue Pulvermacher-Alt, and our developmental editor, Suzanne Guinn, who were knowledgeable, professional, supportive, and a delight to work with. At Brown & Benchmark, Gloria Schiesl, Amy Halloran, Rose Deluhery, Rita Hingtgen, and Mavis Oeth were extremely helpful. We thank Dr. Mina Berkowitz for her many useful suggestions for improving this text and for producing the comprehensive Student Study Guide that accompanies it. We thank Kathleen Glawon of the Department of Education at the College of Staten Island for her on-going assistance, and Professors Raja Jayatilleke and Allen Natowitz of the College of Staten Island Library for their help in obtaining journal articles. We also thank John Behan for his expert advice.

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Finally, we thank our many students who over the years as preservice and inservice teachers helped us focus our thoughts and articulate the ideas expressed in this text.

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SAMPLE CHAPTER FROM THE STUDENT STUDY GUIDE

The following pages contain a sample chapter from the *Student Study Guide* that accompanies *Educational Psychology: Windows on Teaching* by Thomas K. Crawl, Sally Kaminsky, and David M. Podell. For this presentation, the original pages have been reduced in size. By working through each chapter of the guide, you will better understand the concepts presented in the text. Cases with questions written specifically for you appear at the end of the guide. Look for the complete guide at your bookstore, or talk to your bookstore manager.

CHAPTER 6 KNOWLEDGE AND COMPREHENSION

CHAPTER OUTLINE

- I. There are three types of knowledge: declarative, procedural and conceptual. (lrng. obj. 6.1, p. 139)
 - A. Declarative knowledge or "knowing specific things," involves memorizing factual information. (pp. 138, 139)
 - B. Procedural knowledge, or "knowing how to do something," involves knowing the steps required to complete a task. (pp. 138, 140)
 - C. Conceptual knowledge, or "knowing about something," involves understanding the relationships between ideas. (pp. 138, 142)
- II. Declarative knowledge involves memorizing information and is best learned through practice and overlearning. (lrng. obj. 6.2, p. 139)
 - A. Students will retain information longer if they review it often and integrate it with what they already know. (p. 139)
 - B. Distributed practice, with breaks between study periods, is more effective than massed practice, with no breaks. (p. 139)
 - C. Once declarative knowledge is learned, it is automatically accessible. (p. 139)
- III. Declarative knowledge provides the foundation on which to build more complex information and to engage in higher order thinking. (lrng. obj. 6.3, p. 140)
- IV. Procedural knowledge is knowing how to do something; it involves knowing rules and how to apply them in order to complete a task. (lrng. obj. 6.4, p. 140)
 - A. Procedural knowledge is harder to learn than declarative knowledge because it involves mastering a sequence of steps and knowing when to use them. (p. 140)
 - B. Teachers can help students acquire procedural knowledge by explaining the goal of using the procedure, defining the set of problems for which the procedure is appropriate, demonstrating the procedure, allowing students to practice the procedure and giving students feedback about their performance. (p. 141)
- V. Conceptual knowledge is knowing about something; it involves categorizing related information into an organized idea and understanding the relationships between ideas. (lrng. obj. 6.5, pp. 138, 142)
 - A. The level of abstraction of a concept can vary--ranging from concrete (a concept that can be seen and touched) to abstract (a concept that does not have a physical existence). (lrng. obj. 6.5, p. 143)
 - B. Concepts can vary in generality--ranging from general to specific. (lrng. obj. 6.5, p. 144)
 - C. Concepts may vary in complexity--ranging from simple to complex, depending on the type and number of relationships they have with other concepts. (lrng. obj. 6.5, p. 144)
- VI. Four methods of teaching concepts are teaching attributes, using examples and non-examples, using discovery learning and using prototypes. (lrng. obj. 6.6, pp. 145-146)
 - A. Attributes are characteristics of a concept. Teachers can present students with a list of attributes that are and are not associated with a concept and have students identify the correct attributes. (p. 145)
 - B. By presenting examples of the concept (things that "belong") and also presenting nonexamples of the concepts (things that do not "belong"), teachers can help students to better understand a concept. (p. 145)
 - C. To help students learn concepts, teachers can use discovery learning; that is, teachers can structure situations that foster exploration, questioning, hypothesis testing and conclusion-drawing. (p. 146)
 - D. A prototype is the first instance of a concept that comes to mind and possesses the concept's most characteristic attributes, i.e., a model. Students can compare an object to their prototype to see if the object 'belongs' to the concept. (p. 146)
- VII. Schemata--mental structures that represent existing bodies of knowledge--can affect how people process and understand new information. (lrng. obj. 6.7, p. 149)

- A. If students lack appropriate schemata, they will probably not understand the new information. (p. 149)
- B. Information that contradicts a student's existing schemata may be resisted or rejected. (p. 149)
- VIII. Methods of helping students understand material include paraphrasing and summarizing, questioning, PQ4R, notetaking and using graphic organizers. (Lrng. obj. 6.8, pp. 150-151)
 - A. Paraphrasing material--saying it in your own words--and summarizing material--condensing and reconstructing it--are both effective ways to increase comprehension. (p. 150)
 - B. By asking themselves questions, students can test their own understanding, evaluate their own knowledge and examine their own ideas. (p. 150)
 - C. PQ4R--preview, question, read, reflect, recite, review--combines a number of techniques for increasing comprehension, including paraphrasing and questioning. (p. 151)
 - D. Taking notes, or writing down ideas presented by others in one's own words, also enhances comprehension. (p. 151)
 - E. Graphic organizers--various types of charts and graphs--enhance comprehension by helping students analyze the structure of information and organize information in a meaningful way. (p. 151)

KEY TERMS

In the space provided, write a definition for each of the following terms. You may check the accuracy of your definitions by referring to the answer key at the end of this chapter.

1. Declarative knowledge:
2. Rote learning:
3. Distributed practice:
4. Massed practice:
5. Procedural knowledge:
6. General knowledge:
7. Domain-specific knowledge:
8. Conceptual knowledge:
9. Concepts:
10. Concrete concept:

11. Abstract concept:
12. Attributes:
13. Examples:
14. Nonexamples:
15. Discovery learning:
16. Prototypes:
17. Principles:
18. Comprehension:
19. Schema:
20. Reciprocal questioning:
21. Linear array:
22. Hierarchies:
23. Networks:
24. Matrix:

Comprehension Check

Read the paragraphs below. Fill in each of the blanks by selecting a word or phrase from the list of words provided. Note that not all of the words will be used and each word that is used will be used only once. Words are listed in alphabetical order. You may check your answers by referring to the answer key at the end of this chapter.

According to psychologists, there are three kinds of knowledge: knowing factual information or _____ 1 _____; knowing how to do some, or _____ 2 _____; and knowing about something, or _____ 3 _____. Extensive practice, overlearning, and frequent review will help in remembering _____ 4 _____ knowledge. Explaining the purpose of a procedure, describing the kinds of problems a procedure is designed for, demonstrating a procedure, and giving feed back while a procedure is practiced will enhance the acquisition of _____ 5 _____ knowledge.

A general category of ideas, objects or people whose members share specific characteristics is called a(n) _____ 6 _____. Concepts may vary in degree of _____ 7 _____, _____ 8 _____, _____ 9 _____. Three ways of teaching concepts are: 1) by pointing out their _____ 10 _____; 2) by using _____ 11 _____; and by making use of _____ 12 _____. Conceptual knowledge can provide an understanding of why a set of rules (procedural knowledge) is used.

The process by which we construct meaning from incoming information is called _____ 13 _____. Activities for strengthening comprehension include _____ 14 _____, _____ 15 _____, _____ 16 _____, _____ 17 _____, and _____ 18 _____.

abstraction
attributes
complexity
comprehension
concept
conceptual
conceptual knowledge
conditional
declarative
declarative knowledge
examples and nonexamples
generality
inert knowledge
notetaking
overgeneralization
paraphrasing
PQ4R
procedural
procedural knowledge
prototypes
questioning
rote memory
summarizing

CRITICAL THINKING/APPLICATION QUESTIONS

1. Use the content area of mathematics. Describe something that students have to learn that would be an example of declarative knowledge. Describe something that students have to learn that would be an example of procedural knowledge. Give an example of conceptual knowledge in mathematics.
2. Choose a content area such as social studies. Give examples of social studies concepts that students need to know; for each concept, indicate the degree of abstraction, generality and complexity. List the attributes of each concept. Give examples and nonexamples of each concept.
3. Think of a concept that you had to learn. Explain how your current schemata (or lack of them) affected your learning.

FINAL SELF-TEST

Write your answers to each of the questions in the space provided. You may check the accuracy and completeness of your answers by referring to the answer key at the end of this chapter.

1. Name and define the three kinds of knowledge identified by psychologists.
2. Explain how declarative knowledge is best learned.
3. Describe the relationship between declarative knowledge and higher level tasks.
4. Describe the dimensions along which concepts may vary.
5. Describe four methods of teaching concepts.
6. Explain the role of schemata in the comprehension of new material.
7. Describe five ways to help students comprehend material.

ANSWER KEY**Definition of Key Terms**

1. Declarative knowledge: knowing specific things; involves memorizing factual information (pp. 138, 139)
2. Rote learning: remembering through repetition (p. 139)
3. Distributed practice: practice that occurs over time with breaks between study periods (p. 139)
4. Massed practice: practice that occurs in one long period with no breaks (p. 139)
5. Procedural knowledge: knowing how to do things; involves knowing rules and how to apply them in order to complete a task (pp. 138, 140)
6. General knowledge: knowledge used in a wide range of situations (p. 142)
7. Domain-specific knowledge: knowledge used in a limited, defined content area (p. 142)
8. Conceptual knowledge: knowing about something; involves categorizing related information into an organized idea and understanding the relationships between ideas (pp. 138, 142)
9. Concepts: classifications of a set of related ideas or events (p. 142)
10. Concrete concept: a concept that can be seen, that exists, that is tangible (p. 143)

11. Abstract concept: a concept that has no physical existence, that is intangible (p. 143)
12. Attributes: characteristics of a concept (p. 145)
13. Examples: members of the set described by a concept (p. 145)
14. Nonexamples: something that is not part of the set described by a concept (p. 145)
15. Discovery learning: the process in which students 'figure out' principles or relationships as a result of active learning and direct, hands-on experiences (p. 146)
16. Prototypes: the first instances of a concept that come to mind and possess the concept's most characteristic attributes--a model (p. 146)
17. Principles: generalizations that describe relationships between or among concepts (p. 148)
18. Comprehension: the process by which learners construct meaning from incoming information (p. 149)
19. Schema: an individual's existing organization of knowledge about a topic--one's understanding about how the world works (p. 149)
20. Reciprocal questioning: pairs of students ask each other questions about material they have learned (p. 150)
21. Linear array: a line on which events are placed in chronological order (p. 151)
22. Hierarchies: structures describing the relationships between ideas in terms of subordinate and superordinate categories (p. 151)
23. Networks: ways of organizing complex information that show how various ideas are linked to each other (p. 152)
24. Matrix: a graphic organizer that compares several topics along multiple dimensions (p. 153)

Answers to Comprehension Check

- | | | |
|-----|--------------------------|----------|
| 1. | declarative knowledge | (p. 138) |
| 2. | procedural knowledge | (p. 138) |
| 3. | conceptual knowledge | (p. 138) |
| 4. | declarative | (p. 139) |
| 5. | procedural | (p. 141) |
| 6. | concept | (p. 142) |
| 7. | abstraction | (p. 143) |
| 8. | generality | (p. 144) |
| 9. | complexity | (p. 144) |
| 10. | attributes | (p. 145) |
| 11. | examples and nonexamples | (p. 145) |
| 12. | prototypes | (p. 146) |
| 13. | comprehension | (p. 149) |
| 14. | paraphrasing | (p. 150) |
| 15. | summarizing | (p. 150) |
| 16. | questioning | (p. 150) |

- 17. notetaking (p. 151)
- 18. PQ4R (p. 151)

Answers to Final Self-Test Questions

1. The three kinds of knowledge identified by psychologists are: 1) declarative knowledge, or knowing specific things, which involves memorizing factual information; 2) procedural knowledge, or knowing how to do something, which involves knowing the steps required to complete a task; and 3) conceptual knowledge, or knowing about something, which involves understanding the relationships between ideas. (p. 138)
2. Declarative knowledge is best learned through practice and overlearning. (p. 139)
3. Declarative knowledge provides the foundation on which to build more complex information and to engage in higher order thinking. (p. 140)
4. Concepts may vary in degree of abstraction; they may range from concrete--a concept that can be seen and touched--to abstract--a concept that does not exist physically. Concepts may vary in degree of generality; they may range from general to specific. Concepts may also vary in degree of complexity; they may range from simple--with few relationships with other concepts--to complex--with many different kinds of relationships with other concepts. (pp. 143-144)
5. Four methods of teaching concepts are: 1) presenting students with a list of attributes or characteristics of a concept; 2) presenting examples of the concept (things that belong to the concept) and also presenting nonexamples of the concept (things that do not belong to the concept); 3) using discovery learning, structuring situations that foster exploration, questioning, hypothesis testing and conclusion drawing; and 4) comparing an object to a prototype--the first instance of a concept that comes to mind and that possesses the concept's most characteristic attributes. (pp. 145-146)
6. Schemata affect the processing and comprehension of new information. If students have appropriate schemata, they will understand and remember new information. If students lack appropriate schemata, they will probably not understand new information. Information that contradicts existing schemata may be resisted or rejected. (p. 149)
7. Five methods of helping students comprehend material are: 1) paraphrasing material--putting it into one's own words; 2) summarizing material--condensing and reconstructing it; 3) self-questioning; 4) taking notes in one's own words; 5) using graphic organizers--various types of charts and graphs, and 6) PQ4R--preview, question, read, reflect, recite, review. (pp. 150-151)

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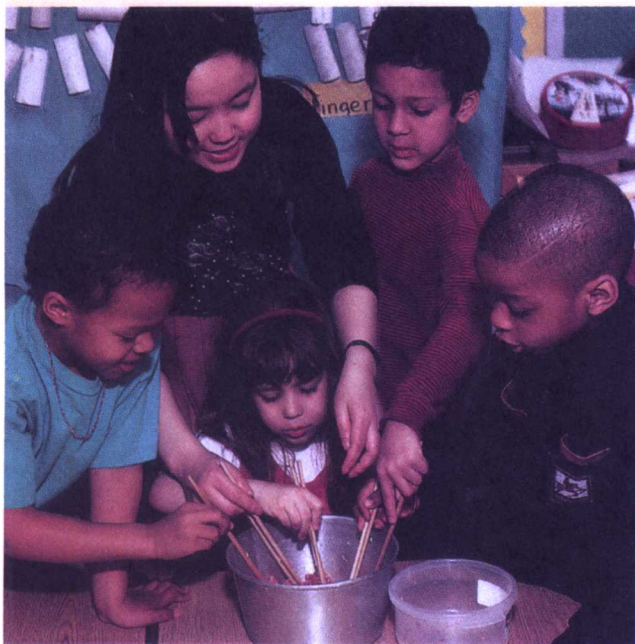
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