CHAPTER 4

Three Schools of Thought about Learning and Teaching

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The Cognitive School of Thought
- Information Processing
- Meaningful Learning
- Cognitive Approaches to Teaching and Learning

The Humanistic School of Thought
- Beliefs of the Humanistic School
- Humanistic Approaches to Teaching and Learning

The Behavioral School of Thought
- Contiguity
- Classical Conditioning
- Operant Conditioning
- Observational Learning
- Behavioral Approaches to Teaching

Is There a Single Best Approach to Student Learning?

Some Final Thoughts

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CONVERSATION STARTERS

How do kids learn best?

There are several points of view about how children learn best. One is that kids learn best when teachers utilize what is known about learning—how new information is taken in, processed, stored, and retrieved. Teachers should understand the mental processes of learning and put to use what is known about such things as attention, memory, and the ways information can be made more understandable.

A second perception suggests that learning improves when the classroom is more humane and when the school is made to fit the child, rather than the other way around. This school of thought about learning values children having good self-concepts and being secure, treating each other with respect, and providing for individual student needs.

The third view contends that learning is best accomplished when teachers know how to alter the learning environment to encourage learning. Among other things, teachers should present what is to be learned in smaller chunks, help learners associate what is to be learned with what they already know, provide more practice, and reward learners when they do things correctly.

What do you think helps kids learn best?

Have you been in classrooms where a teacher was teaching, but students weren't learning? This could happen when you teach. If it does, ask yourself, "what should I be doing that I'm not doing?" Hopefully, when you ask that question, you will have answers. Many of the answers come from learning theory—what we know about learning. That's why the information about learning contained in this chapter is so important to your success. You simply cannot fail at teaching if you put it to use.

4.1
What do you recall about how we learn from previous course work and experience?

This chapter presents basic information from three, among other, schools of thought about how students learn. The schools are cognitive, humanistic, and behavioral (see Figure 4.1). Although the ideas from the three appear to be independent, you will see they share many beliefs.

THE COGNITIVE SCHOOL OF THOUGHT

The first school of thought we will examine has its roots in cognitive science, a field that studies how people think. Specifically, cognitive scientists try to fathom what goes on inside our heads when we are learning. They have contributed two important, wide-ranging ideas that help us understand how people learn and remember. They are information processing and meaningful learning.

Information processing refers to the study of how we mentally take in and store information and then retrieve it when needed. If we understand and use what we know about information processing, we should be able to help our students become better at taking in and remembering information. **Meaningful learning** involves the study of how new information can be most effectively organized, structured, and taught so that it might be used, for example in problem-solving situations. Let's look at these two somewhat different and sometimes overlapping ideas.

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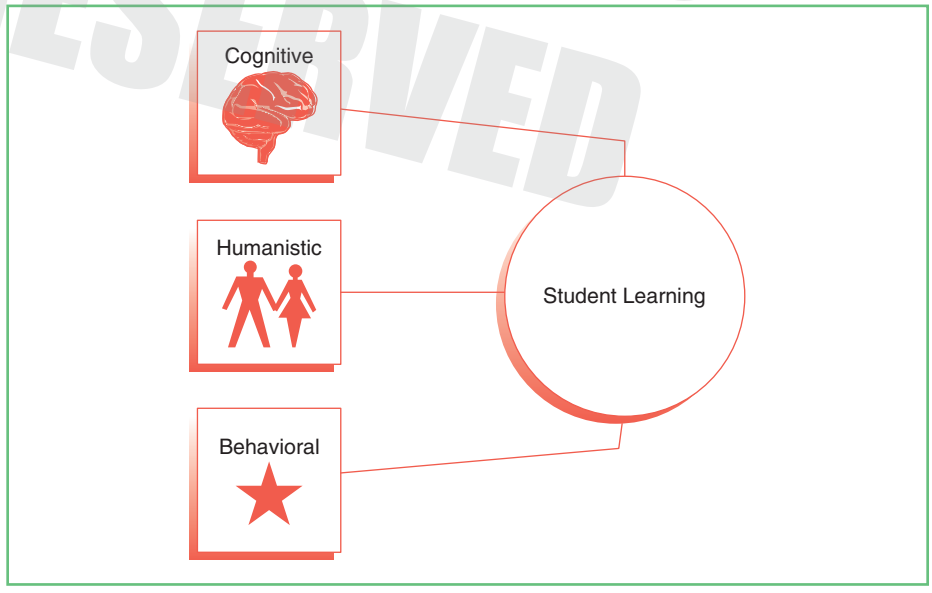
FIGURE 4.1 Schools of Thought That Contribute to Our Knowledge of How Students Learn



Note: The three schools of thought are not entirely independent of one another in that they share certain beliefs about learning.

Information Processing

If you have taken a psychology course, you know that cognitive scientists—persons interested in information processing—study how we *attend to, recognize, transform, store, and retrieve information.* They develop models, such as the one shown in Figure 4.2, to illustrate how they believe information is processed. Essentially models such as this one suggest that although we encounter many stimuli (A), we pay attention to only some of them (B). Of the stimuli we notice, some will be discarded almost immediately (e.g. being casually introduced to another person), while the rest go into our short-term (C), or working, memory (e.g. being introduced to someone you hope to know better). **Short-term memory,** as the term suggests, is a storage system that holds only a limited amount and certain kinds of information for a few seconds. When these stimuli reach our short-term memory, the items we then use (think about) to any degree are transferred to our long-term, or permanent, memory and saved (as in example two above) (D). As the name implies, long-term memory is where we keep information for a longer time. Information that we do not use to any degree, and that therefore does not reach **long-term memory,** is forgotten as if we had never been exposed to it in the first place. Much information to which we have been exposed is lost for lack of proper storage and use.

Computers also have short-term and long-term memory. To illustrate, if we search the Internet using the keyword "learning theory," we may find our three schools of thought about learning—cognitive, humanistic, and behavioral. If the computer is not told to "save" this knowledge before it is shut down, the information is lost since it existed only in its short-term memory. However, if the computer is told to save the information, perhaps placing it in a document or folder, then it is transferred into the hard drive or the computer's long-term memory.

As you might expect, cognitive scientists often try to answer questions that are very important to teachers, such as, What attracts and holds a learner's attention? How can more information be placed into short- and

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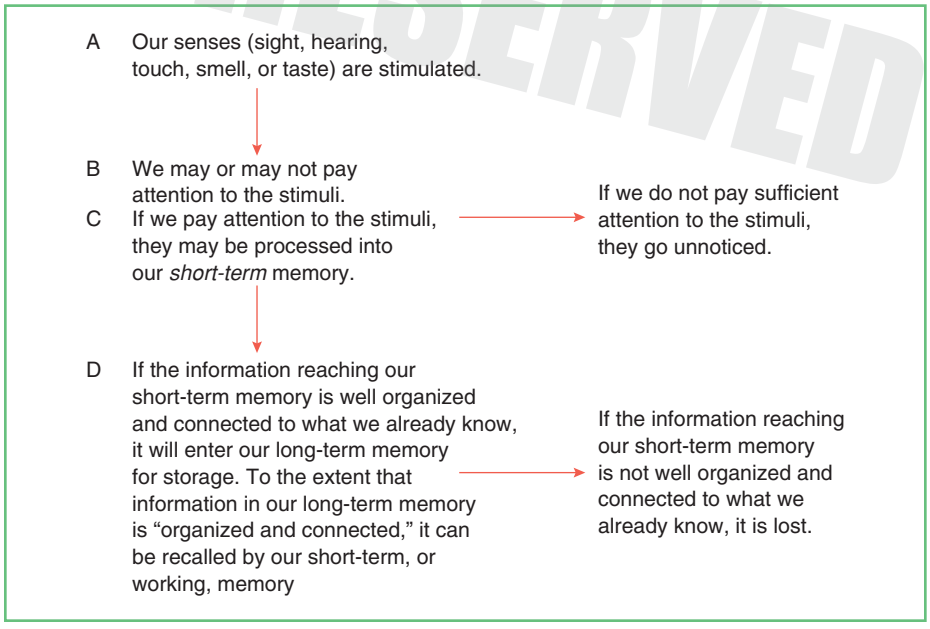
FIGURE 4.2 How Learners Gain or Lose Information



long-term memory? How should we organize and present information to make it more memorable? How can students best study or learn new information? Following are some major beliefs and findings of cognitivists that are related to such questions. These beliefs and findings should have direct bearing on the way you teach.

Beliefs about Attention Getting students to "pay attention" to information is a very real, everyday teacher challenge. Cognitivists suggest teachers use the following guiding principles to gain and hold learners' **attention:**

- *Learning experiences should be as pleasant and satisfying as possible.* Students are more likely to attend to something (mathematics, music, sports) when they have had previous positive experiences with it. If learners' previous experiences with that stimulus have been unpleasant, the experiences you give them must be especially good.
- *Whenever possible, lessons should take into account the interests and needs of students.* Students are more likely to pay attention to lessons that focus on what they want to know or what they want to be able to do. A major task for you will be to encourage them to attend to things in which they may have little or no interest.
- *The attention of learners can be gained and held longer by making use of different sensory channels and change.* A student is more likely to attend to lessons that employ a variety of stimuli, that is, when shifts occur from listening to talking to doing, and so forth. Novelty also helps. Avoid monotony!
- *Learners can attend for only so long, and they differ in their ability to attend.* Younger children and those with dyslexia (a reading impairment) and attention deficiency disorders (described in Chapter 3) have shorter attention spans.
- *Since it is easier to maintain attention when learners are alert, schedule work that requires intense concentration during the morning and work that may be more intrinsically interesting and/or may require less concentration in the afternoon.* For this reason, elementary teachers try to schedule art, music, and physical education later in the day.
- *Call direct attention to information of importance.* Highlight key points or say, "This is important."
- *Distractions interfere with attention.* Find ways to eliminate the many interruptions to learning that students, other teachers, and administrators can cause. Be aware that you too can cause interruptions.
- *Learners can attend to only so much information at any one time.* Students should not be overwhelmed or they may become so confused that they attend to nothing.

4.2
Can you describe instances when your teachers either followed or violated one of the principles for gaining attention?

To the extent that you can get learners to pay attention by applying these guidelines, the information and experiences they have are more likely to enter their short-term memories.

4.3
What will you most keep in mind about getting and keeping student attention?

Beliefs about Short-Term Memory The stimuli we attend to find their way into short-term memory, now often referred to as working memory. But, how do we get some of this information beyond short-term and into long-term memory? Cognitivists believe the following principles to be true.

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- *Short-term memory capacity is severely limited.* Estimates are that adult learners can hold only about five to nine bits of new information at one time. Therefore, it is difficult to remember a meaningless series of numerals, such as a long-distance telephone number or a Social Security number. Young children's short-term memory is much more limited, usually three to five bits.
- *To overcome the limited capacity of our short-term memory, new information can be both* organized *and* connected *to what we already know;* for example, learners can be helped to combine, or "chunk," new information. Thus a 10-bit, long-distance telephone number is placed into three chunks, such as (555) 292–1280. Chunking a 9-bit-long Social Security number also aids short-term memory. Consequently, if it were important to remember the names of the first nine U.S. presidents, we might group them in threes: (Washington, Adams, Jefferson), (Madison, Monroe, Adams), (Jackson, Van Buren, Harrison). Short-term memory also is enhanced by using mnemonics, or systems to aid memory; for example, we more easily recall the names of the Great Lakes if we use the familiar word *HOMES* (*H*uron, *O*ntario, *M*ichigan, *E*rie, *S*uperior) to spur our recall.
- *Information can be remembered better by connecting it with what students already know.* Consider the following task. You are helping students learn multiplication facts. They know that six 6s are 36. You help them see that seven 6s is one 6 more.
- *To forestall forgetting new information, we must use it or, as cognitive scientists say, engage in active "rehearsals" with it.* Such rehearsals can involve either practicing repeatedly or simply thinking about the information. When we engage in recurrent practice, we can move information to our long-term memory through sheer repetition or memorization. Many of us learned multiplication facts in this way, repeating $9 \times 7 = 63$ ad infinitum. Spaced rehearsal, however, seems preferable. Thus, repeating $9 \times 7 = 63$ every hour for five hours is better than repeating it five times in one minute. We might also think about the information, for example, questioning "How can we prove nine 7s are 63?"

4.4
Which knowledge about short-term memory has been most useful to you?

Beliefs about Long-Term Memory As noted, information that learners process extensively, or use in meaningful ways finds its way into long-term memory. Cognitivists believe the following to be true with regard to long-term memory:

- *The capacity of our long-term memory seems limitless.* We never run out of room to learn.
- *We are best able to retrieve information from our long-term memory if that information was related to something we knew at that time.*
- *We can call up, or recollect, related information from long-term memory when processing new information in short-term, working memory.* For example, as you receive new information about how people learn, you can compare it with information you have already learned. In this instance, as you go along, you are able to compare what you already know about short-term memory with what you are learning about long-term memory.
- *Reviewing information fixes it more firmly.* Think about how you have retained the multiplication facts (see Spotlight on Research 4.1).
- *Mnemonic or memory tricks can also be used to aid remembering.*

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4.5
Why do you forget?

General Beliefs about the Memory Process The general beliefs of cognitivists with regard to memory include the following:

- *Information in short-term memory is lost either when that memory is overloaded or with the passage of time.*
- *When information in short-term memory is lost, it cannot be recovered.* If we forget a telephone number or person's home, we must relearn it. In contrast, information in long-term memory can be retrieved and used when conditions are right.
- *Retrieval, or remembrance, of information in our long-term memory is enhanced if we connected the information to something we already knew at the time we originally learned the new information.* Additionally, retrieval is easier when the information is originally presented in an organized way and when that information is reviewed periodically.

Teacher Wendi Pillar describes how she improves her students' memories in Highlight 4.1.

Meaningful Learning

While some cognitive scientists are interested in information processing (attention, short-term/working, and long-term memory), others are interested in how information can be made more meaningful so that it can be better understood and used. These scientists address "meaningful learning," and their work has led to the development of approaches to it that teachers use. The approaches (based upon principles gleaned in part from the literature on information processing cited above or elsewhere) include how to

- prepare students for learning.
- present information logically and clearly.
- connect new information to what learners already know.

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SPOTLIGHT ON RESEARCH 4.1

Practice, Practice, Practice

For a new skill to become automatic (for example hitting a ball or thinking critically) or for new knowledge (e.g., multiplication) to become long-lasting, practice beyond the point of mastery is required. Here is an example. Suppose you are teaching students how a bill becomes a law. They should periodically study these facts and regularly be tested on them. Even when they have mastered the facts, they should continue to study them since memory is prone to forgetting. The key here is to *overlearn* in order to offset forgetting. Without overlearning, most material is forgotten within 3 or 4 years. With overlearning, material can be recalled and used as long as 50 years after the last practice. Therefore if long-term learning is critical—teach, reteach and test, retest. Experts in a skill (e.g., musicians) or knowledge field (e.g., mathematicians) become so mostly because they work hard for extended periods of time. For example, the best violinists indicate they practice more. Generally, individuals must practice intensively for at least 10 years before they make significant contributions in their field. Of course talent counts too but as Thomas Edison remarked, "Genius is one percent inspiration and ninety-nine percent perspiration." In some cases, the school curriculum will ensure that students practice something of long-term significance over years (e.g., arithmetic procedures such as multiplication and division). In other cases, you must decide what skills and knowledge are of most worth and engage your students in overlearning them.

Sources: Gladwell (2008); Pashler (2007); Ross (2006); Willingham (2013).

Highlight 4.1

How To Enhance Student Memory: A Teacher's Suggestions

Wendi Pillars (2012) tells us that her students' memories work best when:

- the information they have learned is returned to *and* built upon (e.g. returning to, practicing, and building upon the multiplication table). "Re-use it or lose it."
- students are given enough "wait time" after a question is asked so that their memory can kick-in. Give them adequate time to think.
- teachers keep in mind the "primacy-recency effect" (i.e. information that is presented and learned first in a given lesson has the best chance of being recalled and that which is presented and learned last is next most likely to be remembered. The middle part of the lesson is what comes up short so get students to think about, discuss, and review the middle part.)
- teachers present new information when learners are not under stress. During stressful times, provide kids with extra assistance and time.
- ensure that new information is linked to what kids already know. When necessary go back and provide the missing information that the new needs to be linked with (e.g. elementary teachers always determine where students left off in arithmetic the previous year so they know where to begin).

- vary the way information is presented or obtained.
- have learners review or rehearse information.
- have students process—think about and use—new information.
- provide students with assistance when needed.
- help students summarize what is learned.
- help students apply what is learned.

To the extent we use meaningful approaches, students will understand and be able to use knowledge.

Cognitive Approaches to Teaching and Learning

One way of teaching based on meaningful learning is called "expository teaching" or "reception learning." Most often we call it *presentation* whereby the teacher directs the learning activity (prepares students for learning, presents information logically and clearly, connects the information to be learned with what students already know, and uses variety in presenting new information). However, just as importantly, the teacher engages and supports learners (has learners review and think about the new information, provides learners with assistance, helps them summarize what they have learned and, when possible, has them consider how to apply it to life situations). Chapter 7 elaborates on presentation since it is a very common instructional alternative.

All eight instructional alternatives presented in Chapters 7–8 of the text are effective ways to teach since they are based wholly or in part on meaningful learning.

Here are other recommended ways of teaching that are expansions or elaboration of forms of meaningful learning (see also Spotlight on Research 4.2). If you teach subjects covered by the Common Core State Standards (see chapter 9), these approaches will be expected of you.

4.6
What authentic learning experiences have you had? What do you recall about them?

Authentic Learning Research suggests knowledge is more meaningful and remembered longer when it can be related to, or results from, a child's real world or when children "learn by doing." So, rather than tell students what

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SPOTLIGHT ON RESEARCH 4.2

What Brain Research Seems to Suggest, or Does It?

Neuroscientists study how our brains develop and work. Some of them, cognitive neuroscientists or brain researchers, study how the brain helps us think and learn.

Some educators hold that brain research provides clear support for certain educational practices. Others argue that most of what we believe is mere speculation without scientific support (Dietrich & Kanso, 2010).

Here are some widely accepted findings and implications for teaching practice.

- Concrete, real life experiences make more lasting changes in the brain. You don't learn how to play a piano or swim by reading about it.
- Teach to both halves of the brain. The hemispheres of the brain must work together for us to engage even in a simple act.
- The more ways information is presented to the brain (visual, auditory, tactile, etc.), the richer the memory.
- The brain is programmed to pay attention to information that appeals to one or more of our emotions (e.g., curiosity, pride, happiness, or wonder).
- Retention of information is maximized using repetition or rehearsal, visualization, etc.

Here are some debatable findings and implications.

- Left Brain, Right Brain. Both brain scientists and psychologists repeatedly deny claims that there is much to the left-brain, right-brain argument that persons who are one or the other are more logical or creative, or better at reading, arithmetic or spatial reasoning.
- Brains as Sponges. Another claim is that there is a critical or sensitive learning period from 4 until 10 during which children learn faster, easier, and with more understanding. Bruer (2003/2004) notes, "Despite what we read in the brain-based literature, neuroscience has not established that there is a sensitive period between the ages of 4 and 10 during which children learn more quickly, easily, and meaningfully."

As Fischer, Director of the Mind and Brain Education Program at Harvard warns, "You can't [automatically] go from neuroscience to the classroom, because we don't know enough neuroscience" (Straus, 2001). A neurologist concurs: "It would be against my medical training to claim that brain-based strategies for teaching are valid" (Willis, 2007).

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they should know, give them tasks requiring them to learn directly from their environment. For example, when students are learning about weather, they learn about and use the tools meteorologists have. When it is necessary to use the library, students learn library skills. When children are to learn numbers they see how numbers are a part of their environment—that there are many reasons they need to know arithmetic, and so forth. Such experiences also provide a sense of personal achievement and self-discovery. See Highlight 4.2 for an example of authentic learning.

Authentic learning is similar to the concept of *direct experience*. Both conclude that firsthand, personal experience is better than secondhand vicarious or abstract kinds. You learn by doing.

Student teaching and classroom practicum experiences are good examples of authentic learning/direct experience.

4.7
Think of a time when you did not understand something. What kind of scaffolding did your teacher use to help you succeed?

Scaffolding The term **scaffolding** puts us in mind of painters and window washers who use scaffolds for support. Providing learners with support also makes sense. When learners need help or guidance, wise teachers provide better directions and better explanations (see Chapter 11), or provide additional learning resources. Some teachers are more able to provide help since they are sensitive to when kids are having trouble and have ideas about what to do about it. You will find that students are very good at helping each other. They often have a sense of what their peers may not understand and why. Peer helping or teaching is a trademark of certain kinds of cooperative learning presented in Chapter 8 (see Case 8.1).

HIGHLIGHT 4.2

An Example of Authentic Learning

When you learned that the nearby elementary school was being given money by the parent teacher organization to build a playground, you happened to mention it to your middle-school students. It somehow caught their attention, and two of the students, Leah and Tyler, eagerly wondered if they or the class could help design it. The principal of your school and the elementary school thought it would be a great idea to have children design children's play space.

Soon your class was enthusiastically making diagrams and deciding what kinds of equipment and space were necessary, the extent of fencing required, and so forth. Models were constructed. Students were faced with various problems: How do you draw to scale? How do you measure angles? How much pea gravel do we need? What are the safety requirements? Soon everyone was engaged in using arithmetic, geometry, measurement, and other subjects.

During the process, students also improved their social ability to work together and their ability to communicate their design ideas to the elementary school's students and interested adults.

Source: Adapted from Bransford et al (2002).

Retrieval Practice (RP) If your goal is to help students improve retention of what you have taught, employ RP. Advocates note that this can be done by having kids frequently and actively think about and recall important information using any of these activities: self-testing (e.g. using flash cards, chapter-ending questions) and thinking about, writing about, or applying what was learned. Keep in mind that RP is particularly beneficial when it requires learners to think about and use what has been learned (Karpicke & Blunt, 2011; Roediger & Butler, article in press; Science Daily, 2010).

Graphic Organizers are visual displays of information. You are familiar with figures (see Figure 4.1), tables (see Table 4.1), and outlines. Many other kinds of graphic organizers are used to enhance learning and understanding (Marzano, Pickering, & Pollock, 2001). One of them is a concept map.

Concept maps or charts help students see the connections or relationships between things. For example, you could make a concept map of dozens of characters in a novel or film that would enable you to keep them and their relationships to each other straight. Think *Harry Potter* or *Walking Dead*. To illustrate, take Harry and place his name in a circle in the middle of the page and then place other characters in surrounding circles in proximity to Harry's. Those circles might be labeled: friends Ron Weasley and Hermione Granger, Hogswart staff Hogwart students, etc. So you would have a middle circle for Harry and adjacent circles for closest friends, Hogwart staff and students. Surrounding each of those would be additional circles containing individual belonging in each group. Lines are drawn from one circle to another to show the relationships between and among the circles and subsets of characters. Write words on the lines to describe relationships (e.g. lines from Harry's circle to Ron and Hermione's might have the label "closest friends"). This activity would help learners clarify the roles and relationships of Harry Potter characters.

Student learning is enhanced when information is used or processed, and making concept maps or other graphic organizers does that and most students enjoy such challenges.

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TABLE 4.1 A Comparison of Cognitive, Humanistic, and Behavioral Views

	Cognitive	Humanistic	Behavioral
Focus	Understanding how we acquire knowledge	Understanding how we develop feelings, attitudes, and values	Understanding how our behavior is modified by our environment
Topics/Themes	Information processing Meaningful learning	Basic needs Affect (emotions, feelings, attitudes, values, predispositions, morals)	Contiguity Classical conditioning Operant conditioning Observational learning
Special Concepts	Attention Short-, long-term memory Linking new and old information Clarity Instructional variety	Self-worth Efficacy	Reinforcement
Some Instructional Approaches that Support Learning	Expository teaching Authentic learning Scaffolding Reciprocal teaching Problem solving	Cooperative learning Inviting school success Values clarification Moral/character education Multiethnic education	Direct instruction Programmed and computer-assisted instruction Mastery learning Precision teaching Applied behavioral analysis

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Reciprocal Teaching (ReT) **Reciprocal teaching** is an instructional activity during which a dialogue or interchange takes place between teacher and students regarding what is to be learned (Palincsar, 1986). The dialogue is characterized by higher-order thinking, as you will see below.

Usually ReT is thought about as a way to help kids comprehend or understand what they read. Before, during, and after reading, they are directed to employ at least four learning strategies:

- *Predicting:* Readers predict beforehand what the "story" will be about based on the title, illustrations, or graphics ("What do you think ReT is?").
- *Questioning:* Readers make up questions they would like answered as they read ("How does ReT work?").
- *Clarifying:* Readers clarify what they do not understand, getting help from further reading or other students ("What does *reciprocal* mean?").
- *Summarizing:* In their own words, learners identify key ideas and bring them together to create a summary ("Here are the key ideas about ReT and how they relate so that I can use it when teaching.").

Everyone thinks aloud about what they will read or have read using these four strategies and others (see Highlight 4.2).

Reciprocal teaching has other shades of meaning (Seymour & Osana, 2003). One is the gradual shifting of teaching responsibility to students. Suppose the instructional objective you have is to teach students how to summarize. As you teach summary making, you gradually shift teaching responsibilities to students. For example, you ask Julio or Kathleen to tell how they summarize and how that may differ from your preferred method.

You stand aside and listen. You prompt reactions and comments from other students. At other times you might ask learners to go to the board and demonstrate and describe how to multiply fractions or diagram a sentence. Such instances are always accompanied by student interchanges (more thinking aloud, more clarification or other mental processing of the information to be learned). Studies show reciprocal teaching is quite effective (Hattie, 2009).

Some forms of cooperative learning, described in Chapter 7, seem to draw heavily from the concept of reciprocal teaching.

Problem Solving Another approach to learning that cognitive scientists like is problem solving. **Problem solving** requires that a situation exists in which a goal is to be achieved and learners are asked to consider how they would attain the goal. There are different types of problems. Snowman, McCown, and Biehler (2011) describe two. One type, often encountered when studying something exacting like math or science, is a *well-structured problem* that can be solved by applying a specific mathematical or scientific procedure. As a young student, you worked on well-structured mathematical problems that required the application of multiplication or division to obtain an answer: For example, "If you have 18 apples and wish to fill gift boxes with 6 apples each, how many boxes can you fill?" (see also Highlight 4.3). Another example: Each time as a teacher that you prepare a classroom lesson, you will be solving a well-structured problem since there is a goal you hope to achieve (writing the plan) and there are procedures or strategies to be applied (described in Chapter 6).

4.8
Can you think of any "well-structured" problems in the subject matter you will be responsible for teaching?

Then there are *ill-structured or unstructured problems.* Here, no specific procedure exists that can be followed or applied to obtain a finite solution such as those above (to place 18 apples, 6 to a box, 3 gift baskets would be needed). Furthermore, ill-structured problems address larger, more complex issues or real-life concerns such as: What should be served in a school lunch room? How can toxic wastes be disposed of? What is good art? *Problem-based learning* is especially appropriate when ill-structured problems arise. This procedure suggests that learners: (1) be questioned to find out what they already know about the problem, (2) decide what they need to learn and what available resources exist, (3) engage in learning, and (4) organize and present what has been found out (DeRoche, 2006). It is often associated with discovery learning (see Chapter 8).

4.9
What are some other "ill-structured" problems you have faced?

Problem-based learning seems to be more effective in long-term learning for middle school kids than lecture/discussion (Wirkala & Kuhn, 2011).

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HIGHLIGHT 4.3

Worked Examples

Worked Examples is a problem solving procedure for use anytime a skill or technique is to be learned in any subject such as arithmetic. It begins with a step-by-step demonstration by the teacher of how to perform a task or how to solve a problem, for example an algebraic equation (4x=12, x=3). Next, the teacher shows students other exampes of solutions to similar equations (5x=25, x=5). Learners think-through and talk about the steps in the solutions. They cognitively, thoughtfully, process the procedure. Thirdly, learners are asked to solve problems on their own (6x=24. X=?). The provision of the second step, having students see and walk-though already worked examples prior to trying a new procedure has been shown to be learning effective (Pashler 2007).

To summarize, major beliefs about problem solving include the following:

- A major goal of education is to help students learn to solve all types of problems, both subject-matter-related (well-structured) and people- or life-related (ill-structured).
- Some problem-solving strategies tend to be subject-area-specific, such as procedures for solving mathematical or scientific problems. For example, we apply the quadratic formula in order to solve a quadratic equation, or a procedure for solving "train problems" involving distance-rate-time calculations.
- Other problem-solving strategies are more useful when dealing with ill-structured problems. A general problem-solving strategy might include the following steps: (1) State the goal to be achieved, (2) identify the obstacles standing in the way, (3) project alternative ways to achieve the goal, (4) consider the consequences of each possible solution, (5) decide how to implement the best proposed solution and do so, and (6) evaluate your degree of satisfaction with the problem resolution. Chapter 14 will help you learn how to solve ill-structured challenges classroom teachers face.

4.10
How prepared are you to teach problem solving?

4.11
What is your feeling about cognitive approaches to learning?

Try Activity 4.1 a or b
on page 117

THE HUMANISTIC SCHOOL OF THOUGHT: SOCIAL AND EMOTIONAL LEARNING

A second school of thought offered to explain how we learn and, therefore, how we should teach comes from humanistic education and social psychology. Humanists maintain education should be based upon the needs and interests of learners. After all, needs and interests are what drive or motivate us. Moreover, they want education to be based upon the needs and interests of *individual* learners. Thus, education should be as personal as possible. Social psychologists want us to recognize the importance of social interactions and social influences on behavior including learning.

Said another way, the humanistic school urges that we teach according to the interests and needs of children and, furthermore, that we create healthy social and emotional classroom environments characterized by acceptance and respect. Doing these things enhances learning.

Beliefs of the Humanistic School

This view of how we learn holds the following beliefs:

- The school curriculum should provide for both the *needs* and *interests* of kids. Needs include personal safety and security, love, belonging, achievement (see Figure 12.4 and Maslow, 1998) and autonomy, competence, and healthy social relationships (Deci & Ryan, 1990). For example, **affiliation** is a strong human need. Therefore the school should ensure that all children have the opportunity to have good relationships with their peers and the teacher (see Chapter 13). With regard to their interests, among other things, children are interested in their environment and should have the opportunity to learn in and from it.
- Learning should be individualized and personalized. It should be self, rather than teacher-directed. Kids should be given latitude to learn

4.12
If you have had a teacher who seemed "humanistic," what was it like to be in that classroom?

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what they personally have interest in and how they wish to learn. The school should fit the child not the child fit the school (Neill, 1969).

- Learners should not only regulate what and how they learn but also be responsible for evaluating themselves and their progress (Schunk, 2008).
- Knowing *how* to learn is more important than the acquisition of specific knowledge (Gage & Berliner, 1998).
- Developing attitudes and values are as important as acquiring knowledge. Therefore teachers should make sure affective or attitudinal learning objectives are pursued. For example, learners should learn how to "attend to, respond to, value, internalize, and act on information or knowledge." They must know *how to think about* and *what to do with* information. (See Instructional Objectives in Chapter 6.)
- Learners learn best in a psychologically safe environment where they are accepted and valued. Each child should be accepted as he is, not judged by what he should or could be (Rogers & Russell, 2002).
- Learners learn best when they have good feelings about themselves and others. They prosper when they have self-respect and a feeling of **efficacy** or control over what happens to them (see Motivating Students to Learn in Chapter 5.).
- We would do well to try to place ourselves in the shoes of learners in order to see learning from their perspectives.

4.13
How might you use some humanistic beliefs about learning?

Major contributors to this school of thought include Carl Rogers, Abraham Maslow, Paulo Freire, Ivan Illich, John Holt, and Malcolm Knowles.

Humanistic Approaches to Teaching and Learning

Some examples of humanistic teaching and learning are presented in Chapters 7 (Individualized Instruction) and 8 (Cooperative Learning). The **project method** permits kids to pursue their personal learning interests. Cooperative learning promotes social and emotional growth where children share, accept, and respect each other ("all for one, one for all"). Here are other examples.

Inviting School Success *Inviting School Success* was developed to get teachers to communicate to learners that they are "responsible, able, and valuable" people (Purkey & Novak, 2005, p. 3). To convey this, invitational learning calls upon teachers to (1) know learners' names, (2) have individual contact with each learner, (3) show learners they respect them, (4) be honest with learners and themselves, (5) not take a student's rejection personally, and (6) respect themselves as teachers. Creating an "inviting classroom" follows.

Social and Emotional-Based Learning Certain school and community programs aim to help students-grow socially and emotionally. They intend to help them: establish and maintain good interpersonal relationships, increase caring for others, manage their emotions, make responsible decisions, and set and achieve positive goals. The investigators conclude that such programs provide students with improved social and emotional skills important

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in their daily lives *and* that they also can improve academic achievement (Durlak and others, 2011).

Values Clarification Values clarification refers to techniques by which learners (1) identify how they feel or what they believe about something, (2) value that feeling or belief and, (3) if valued, act on it (Simon, Howe, & Kerschenbaum, 1995). The intention is for learners to become aware of the values they hold, since those values influence their behavior. Then, they consider the legitimacy or goodness of what they value. For example, learners could be asked to what extent they believe in gun control. After stating their preference, they are encouraged to share and explain their position and why they hold it. Once they have examined their value in relationship to the values others hold, learners are better able to prize their value or to modify or reject it. Once the value is prized, learners are expected to go the next step and act on the value. For example, learners might be asked, "All right, if you believe that strongly about gun control, what can *you* do?"

4.14
Have you had experience with any of the humanistic approaches to education? Which ones?

Moral Education Moral education is akin to character education, values education, and citizenship education. These techniques are designed to help learners develop more responsible behavior both in and out of school. Teachers can do a number of things to enhance higher levels of students' morality and character, such as (1) serving as role models who are always respectful and caring of others and who intervene as necessary to get students to be respectful and caring, too, (2) creating a family or community atmosphere in the class so that all students feel worthwhile and care about one another, and (3) encouraging students to hold high academic and behavioral standards in order to teach the value of work as a way to develop oneself and contribute to a community (Lickona, 2004).

For an extensive overview of Moral Education go to the Office for Studies of Moral Development in Education web link at the University of Illinois, Chicago. For a "how to" book go to Nucci (2008).

4.15
What is your reaction to humanistic approaches to learning?

Multiethnic Education Multiethnic education refers to educational practices that encourage learners to revere their roots and culture—ideas, customs, skills, arts, and so forth—*and* to revere the culture and diversity of others. Proponents want learners to see the advantages of our pluralistic society. Related educational practices include helping learners become aware of the various contributions of ethnic and national groups to a nation's development and well-being, and encouraging learners to find out more about their own ethnic and cultural backgrounds. See Chapter 3, Cultural Differences.

Try Activity 4.2 a or b on page 117

Humanistic approaches seem to produce wonderful results. For example, they have been found to increase school attendance; decrease the dropout rate; and improve student attitudes, behaviors, and academic achievement (Ragozzino et al., 2003).

THE BEHAVIORAL SCHOOL OF THOUGHT

4.16
Think of a subject you avoid. Now think of why you may dislike it. What might be done to change your attitude?

The third school of thought about learning, teaching, and education is behaviorism. Behaviorists, as the name implies, help us understand why we behave as we do. They are interested in finding out how external, environmental stimuli cause overt or observable learner behavior and how modifying a learner's environment can change behavior.

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If you have studied psychology you probably learned something about contiguity, classical conditioning, operant conditioning, and social learning—concepts of prime interest to behaviorists.

Contiguity

Contiguity refers to simple stimulus-response (S-R) pairings, associations, or connections, such as lightning and thunder, which occur closely together. When one experience, a stimulus, is regularly associated with another, a response, an S-R connection is established. Like the combination of lightning and thunder, the S-R connection usually occurs within a very brief time span, thus, the *contiguity* label. We can learn by simple S-R pairing such facts as Columbus landed in America in 1492 and $9 \times 7 = 63$. Many concepts and facts are learned through simple stimulus-response learning, for example:

Stimulus	Response
Sodium chloride	Salt
Van Gogh	Artist
Eiffel Tower	Paris

Classical Conditioning

4.17
What kinds of S-R responses might you want from your learners? How can the responses be associated with something desirable so that they occur?

Classical conditioning refers to learning that occurs when we already have an established connection (contiguity) between a primary or original stimulus and a response, and then we pair a new, secondary stimulus with the original stimulus long enough that it begins to evoke the original response even when the original stimulus is absent. Remember Pavlov's dogs? Pavlov, a Russian psychologist, found that his experimental dogs naturally salivated (responded) when his lab assistants fed them meat powder (a stimulus). Later, he found that the mere presence of his lab assistants (new stimulus) caused the dogs to anticipate being fed and to salivate. Let's consider a school example. Students and teachers alike associate a bell (stimulus) with the ending of a class period. Teachers often assign homework at or near the close of class. Thus, the mere assignment of homework (new stimulus) will elicit many behaviors or responses associated with the ringing of the bell—packing book bags and so forth. For this reason, some teachers assign homework at the beginning of class.

Operant Conditioning

4.18
How is reinforcement used by your instructors?

Operant conditioning refers to learning facilitated through **reinforcement.** A learner does something correctly or appropriately and, consequently, receives a reward. Operant conditioning presumes that if we do something we are rewarded for or which is rewarding in itself, we will do it again. Conversely, if we do something that is not rewarded or rewarding, we will be less likely to repeat the behavior. Operant conditioning is based upon a pleasure-pain view of human behavior. To illustrate, consider Jason, a learner who has turned in an essay on gun control. The teacher has dutifully analyzed the essay and responded to it as follows: "This assignment is complete and well written. You have found and used many references. You have presented the major points on both sides, and you have drawn your own thoughtful conclusions. Obviously, you enjoy studying issues and responding to them. May I place your paper on our bulletin board?" Assum-

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ing Jason finds the teacher's comments and the display of his paper rewarding, he likely will want to write another essay. Chapters 11 and 14 will discuss more about reinforcement.

Observational Learning

4.19
To what extent do you believe you will model a former teacher(s)? In what ways?

Observational learning's main tenet is that you can learn a lot by watching others. According to its early theorist, Bandura (1986), for observational learning to be effective, learners must attend to someone's behavior, retain what they observed the "model" doing, imitate or reproduce the behavior they saw, and experience reinforcement or satisfaction as a consequence. We know learners are most likely to model persons who are somewhat like themselves and whom they perceive as competent, warm, or powerful. Thus, primary children frequently identify with parents or with television or movie characters, especially superheroes, and mimic what they do. A kindergarten teacher describes an example of social learning:

> The resurgence of Batman: Raymond brought in a "cape" and all the children were anxious to wear it and run around the room in it. During free play, children were busy making Batman equipment. Story time and singing time were always interrupted by children who were busy describing Batman antics. The entire morning was Batman-oriented and the children could not be interested in much else.

If an elementary school has a Halloween parade, characters such as Raphael, the Teenage Mutant Ninja Turtle, Snow White, Spiderman, or Harry Potter readily appear. On the other hand, if middle and secondary students have the occasion to wear costumes, they would more likely dress and act like rock or hip-hop personalities or athletes.

Such learning also occurs when we see something good or bad happen to another person. For example, if we were to see a friend praised for her schoolwork, we might try to imitate what she does so we can be praised, too. Conversely, we might avoid doing what another student does if her behavior is not well received.

If you hold to classical conditioning, operant conditioning, and observational learning, you will do the following:

- *Make the classroom enjoyable intellectually, socially, and physically* so that learners feel safe and secure.
- *Be open and specific about what needs to be learned.* Use specific behavior objectives when writing lesson plans (see Chapters 6 and 11) and share those objectives with learners.
- *Be certain that learners have basic knowledge and skill* that will enable them to learn new material.
- *Show connection of new learning to previous learning.*
- *When new material is complex, introduce it gradually.* Organize new material into sequential, short, easily learned parts.
- *Associate what is to be learned with things learners like.* For example, associate poetry with rap. Conversely, don't associate what is to be learned with things learners don't like. For example don't use schoolwork as punishment.
- *Tell learners what is most important.* Cue them.
- *Recognize and praise improvement.* Don't expect all students to learn at the same pace and in the same amounts.

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- *Find out what is rewarding to each student* and use that to reinforce student learning. Some learners may be rewarded by receiving verbal public praise while others may find it embarrassing.
- *When a task is new or difficult, provide more regular reinforcement.* Once learners have mastered a new task, use only occasional reinforcement.
- *Reinforce the learning behavior you expect from students:* for example attending, engaging, trying, responding, improving, completing.
- *Encourage shy or insecure learners' responses.* Look for shy children who do not volunteer and give them opportunity. Caution students to respect responses of others that differ from their own, or even are incorrect.
- *Create situations whereby each student has the opportunity to succeed.*
- *Model behavior that you want learners to imitate.* For example, show enthusiasm for learning and respect for all.
- *Draw attention to students who demonstrate desirable behavior* or produce quality work but not to the point of causing them to be alienated from their peers.
- *Ask parents to reinforce desired behaviors at home*—to recognize enthusiasm for learning, effort, and growth.

4.20
What behavioristic beliefs do your teachers seem to use most and least?

You will notice many behaviorist beliefs described previously are similar to those held within the cognitive school of thought. The major differences are that behaviorists more often advocate that: new knowledge should be organized into shorter more easily learned parts, improvement should be recognized and praised, every child should have opportunities to succeed, *learning* behaviors should be reinforced (e.g., attending, trying, completing), mutual respect is essential (everyone counts and is important), and that learning is never associated with punishment. Behaviorists are more likely to use "carrots and sticks" to get kids to learn.

Since the dignity of learners is important to behaviorists, some of the above characteristics are like those held within the humanistic school.

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Behavioral Approaches to Teaching

Certain instructional alternatives are more supportive of the beliefs of behaviorists. Of those, direct instruction (described in Chapter 8) comes closest. DI generally advocates presenting information in small steps, using many illustrations and examples for reinforcement, asking learners many questions in order to check for understanding and providing corrective feedback, providing lots of practice, ensuring learning by keeping students on task for as long as it takes, and so forth. Take a look at Lesson Plan 8.4.

Additional ways of teaching advocated by behaviorists:

Programmed Instruction (PI) PI involves organizing material to be learned or practiced into small parts called *frames*. Learners respond to a question or problem (stimulus) in each frame; if their response is correct, they receive positive reinforcement and the next frame is presented. When learners respond incorrectly, they may be asked to repeat or be given more information to help them produce a correct response. Learners utilizing programmed instruction typically work at their own pace.

Computer-Assisted Instruction (CAI) CAI refers to the use of computers to present programmed instruction or to otherwise assist learners with specific learning tasks. Many different kinds of CAI programs are available, and most require learners to engage in lots of drill and practice. Although most CAI programs follow an operant conditioning, stimuli-response-reinforcement pattern, CAI also can be used as a cognitivist approach; some CAI programs, like programmed instruction, teach new concepts, and others engage learners in creative tasks and problem solving. For example, some computer software programs encourage children to make up stories and to illustrate them or provide simulations requiring problem-solving or creativity.

Programmed instruction and CAI seem to be a little more effective than normal educational practices, probably because they make extensive use of practice and reinforcement.

Mastery Learning Mastery learning is a third educational practice based upon behavioral theory. It, too, allows students to learn academic material at their own pace. In practice, all students in a class might be expected to reach a certain level of proficiency, for example, at least 80 percent correct answers on a geography test. Those who fail to reach that criterion level may receive additional time and corrective instruction until they obtain that score. The general intent is to give immediate, additional help to low or slow achievers so they stay even with higher or faster achievers. While low or slow achievers receive corrective instruction, high or fast achievers engage in enrichment work on the same or on a similar topic.

Advocates of mastery learning propose you (1) prepare a lesson with clear, specific objectives, (2) use learning material that allows students to accomplish those objectives, and (3) prepare not one, but two, tests. Following instruction, students take test 1. Those that meet some preestablished passing criterion, such as 80 percent, move on to supplementary enrichment activities, while those falling short receive corrective instruction based on a different instructional approach or using different instructional materials. After additional instruction, a second, similar test (test 2) is given to the lower achievers. When a large majority of all students (perhaps 80 percent) have passed either test 1 or test 2, the class moves on to new work. The cycle can be repeated until you, the teacher, feel that a large enough majority has reached mastery to permit going on.

Mastery learning seems most important when the material to be learned is critical or "high stakes" material, for example, the basic information or skills in any content field.

For a more complete understanding of mastery learning check out Guskey (2010).

Response to Intervention (RTI) is like mastery learning in that it is intended to help struggling students. "Generally, a RTI program has three tiers of instruction. At tier one learners have regular classroom teaching. Children having difficulty go to tier two where more intense instruction is provided. Those still in need of help go to tier three where instruction is even more intense and is further individualized. If a child seems unable to achieve at this tier, referral for additional or special services may be made. Key features that set this procedure apart are careful monitoring of progress and individualization (Samuels, 2006).

Precision Teaching (PT) PT occurs when learners master a fact or skill (such as correctly spelling a word or applying an arithmetic algorithm such as division), and then *continue* practicing these skills until they achieve a high

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level of precision or fluency. "Practice makes perfect." Teachers using PT might give daily one-minute practice exercises (e.g., multiplication facts) and chart how many items are correct. Learners also chart progress. Its tenets derive from principles of information processing (see the section on short-term memory).

Applied Behavioral Analysis (ABA) ABA also is based upon behavioral beliefs and findings and is informed by principles of operant conditioning. It is often used in clinical settings (hospitals, prisons, schools) to modify the behavior of clients toward more acceptable patterns. ABA follows a prescribed procedure. First the practitioner—for example, you the teacher—identify a student (client) and the student's behavior that is to be changed. You then determine how often the student presently performs the desired behavior—for example, waiting to be called on before talking. This is called the *baseline.* Next, you introduce an intervention. An intervention is usually some reinforcement the student receives every time she performs the desirable behavior. Use of reinforcement encourages the student to behave appropriately more often, that is, more than the client did at the outset or baseline.

Here is an illustration of ABA in a classroom. Jane produces very little when given a writing assignment, even one of her choice. In most cases, her text amounts to a few short sentences. Because she is fairly conversational, you decide you might encourage her to be more forthcoming by having her tell you what she would like to say. As she does, you prompt her to write down the ideas she is expressing. Each time Jane writes her ideas in a writing assignment, you praise her for any increase in the number and range of her ideas. When you evaluate her written work, you comment that, increasingly, Jane's compositions are more complete and interesting. You may even share one or more with the class.

4.21
What do you think of the behavioral approach to learning?

Behavioral analysis always uses the principles of operant conditioning. A close cousin is behavior modification, which is also an attempt to change behavior but is a more general concept that includes use of hypnosis, drug therapy, and electroconvulsive shock treatment as well.

Try Activity 4.3 a or b
on page 117

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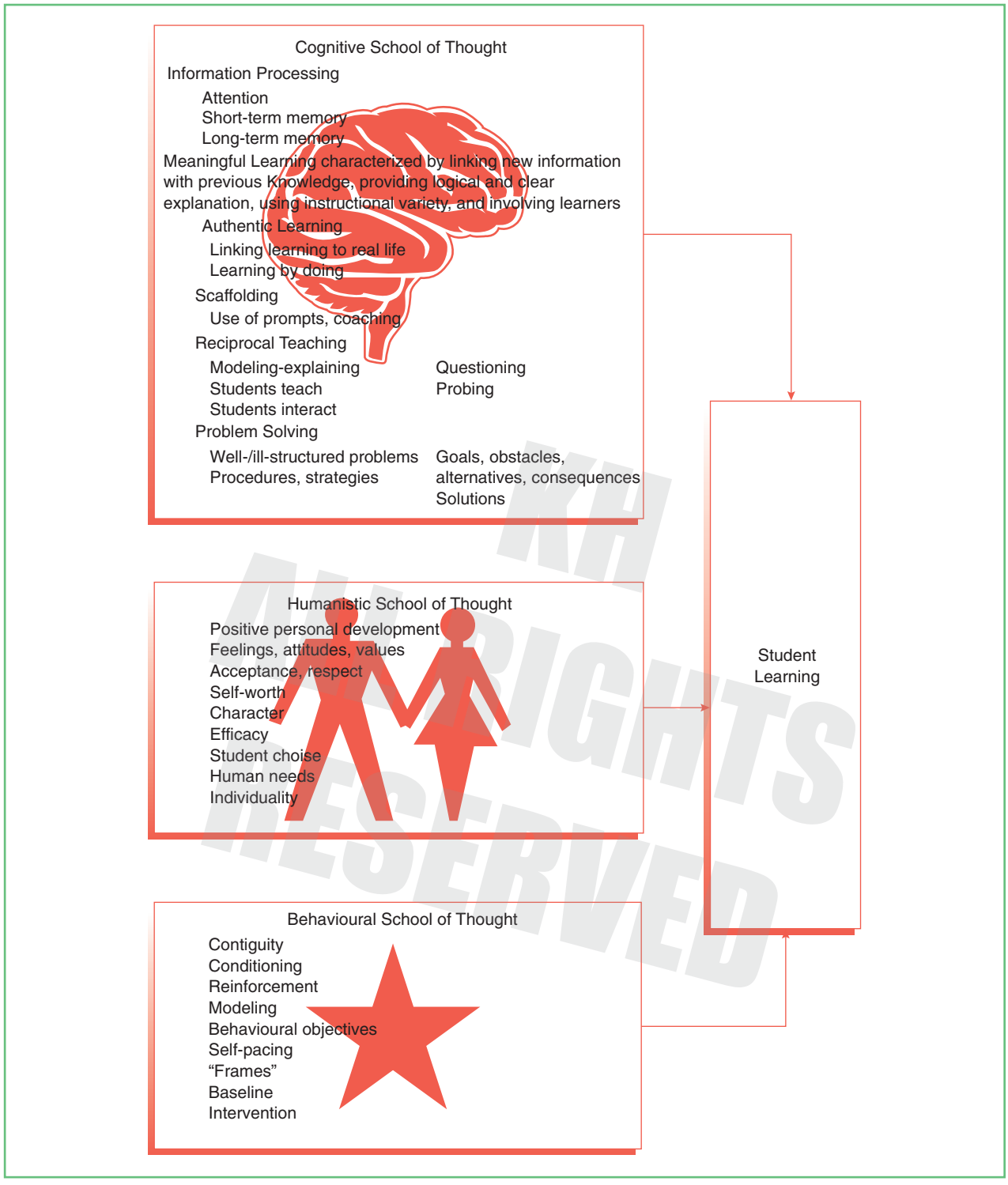
IS THERE A SINGLE BEST APPROACH TO STUDENT LEARNING?

We have identified three views of learning that influence the approaches teachers take to instruction. Figure 4.3 brings them together for comparison. Each approach has been defined and its major beliefs and findings noted. Some have fostered the development and use of specific educational practices which are briefly described. Table 4.1 (on page 114) compares the three approaches.

A great deal of controversy exists as to which of the approaches to learning is superior (Viadero, 1996). If you ask your university instructors, you may be surprised at the strength of their feelings. You may especially find that those who espouse cognitive or humanistic beliefs shun behaviorism, although the reverse is also true.

Teachers who work with exceptional individuals (see Chapter 3), especially those with unique learning and behavioral characteristics often find the behaviorist school of thought is most helpful. There certainly is strong research support for applying its beliefs and findings. For example, Walberg (1986) reports that 98 percent of studies investigating the effects of behavioral learning on

FIGURE 4.3 Three Schools of Thought about Learning and Related Key Concepts



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students have positive findings. At the same time, Walberg tells us good support also exists for cognitive and humanistic approaches to instruction (p. 97). What do students think is the best approach to learning? When several hundred 12- to 14-year-old students were asked, they reported 10 to 1 they preferred to learn in meaningful ways (Kinchin, 2004). That's a big margin.

Dembo (1994) reminds us there are differences of opinion about learning not only among but also within the various schools of thought. He also points out what you have probably already concluded by now, that most educators draw from all three schools of thought. The secret, Dembo informs us, is to have a knack for knowing when to use ideas from the various perspectives since each has strengths and weaknesses, depending on the purpose you may have in mind. Anderson, Reder, and Simon (1996) agree. Speaking to the same point, Snowman, McCown, and Biehler (2011) note that advocates of discovery learning do not suggest that students discover every fact or principle or formula they need to know but rather that certain types of learning outcomes can best be achieved through personal discovery.

Brophy (2003) concludes "There are several qualitatively different kinds of learning, each with its own set of optional instructional settings, activities and techniques . . . these distinctions remind us that different types of learning require different [kinds of instruction]" (p. 201).

4.22
Which features of which schools of thought about learning attract you? why?

SOME FINAL THOUGHTS

Helping your students learn is the "bottom line." However, as you can recall from your own school experiences and from the teacher-reported problems that follow, doing so is not always simple. Therefore, you need to learn all you can about learning and teaching and to recognize that the two are inextricably bound together. You can be an excellent teacher *only* when you understand what is known about each and can put that knowledge to work every single time you arrange a learning experience. If your students experience difficulty or failure, you must "go back to the books" and analyze what may be interfering with learning (see Highlight 4.4). Never shrug your shoulders or give up on a single child. The knowledge needed to help each child learn is available; it is up to you to find and use it. Reflect on each incidence of failure to learn, and then regroup and try again and again. Remember, teachers are professionals with the opportunity, knowledge, and responsibility to make a difference.

Try Activity 4.4
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HIGHLIGHT 4.4

What to Do When Students Aren't Learning

The Harvard Tripod Project suggests that when kids aren't learning, we should do these things:

- Look at students' work and identify where the problems are.
- Talk with the kids and find out what it is that they don't understand and why.
- Alter instruction to help them succeed.

Were the students ready for the work? Did they have adequate background and preparation so that they could succeed? Was the work clearly presented? Were differences in learner ability and interests taken into account? Was additional help provided when necessary?

Source: Harvard Education Letter online (2006).

CHAPTER SUMMARY

- Three major schools of thought on learning and teaching are the cognitive, humanistic, and behavioral perspectives.
- Cognitivists are interested in how knowledge is acquired. They focus on information processing and meaningful learning. Information processing looks at the phenomena of attention, short-term memory, long-term memory, remembering, and forgetting. Meaningful learning focuses on how learners can best learn to understand and use information. Educational practices promoted by cognitivists include reception learning, authentic learning, scaffolding, reciprocal teaching, and problem solving.
- Humanistic proponents emphasize the importance of meeting the needs and interests of students through individualizing and personalizing instruction. As a consequence, they support that learning should be *more* student- and *less* teacher-directed and that students should take greater responsibility for their successes and failures. Equally important, humanistic learning advocates the necessity of having classrooms where children feel physically, socially and emotionally secure. Educational practices that support humanistic learning include individualized instruction, the project method, some types of cooperative learning, inviting school success, values clarification, and moral education.
- Behaviorists are interested in how the environment can be changed or manipulated in order to change behavior in a desirable direction. They study contiguity, classical conditioning, operant conditioning, and social or observational learning as means to behavioral change. Educational practices that support the behaviorist school of thought include programmed instruction, computer-assisted instruction, mastery learning, precision teaching, and applied behavioral analysis.
- Most teaching draws from all three schools of thought according to the learning task at hand and the characteristics and needs of the students.

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NEW CONCEPTS

Information processing 96
Meaningful learning 96
Short-term memory 97
Long-term memory 97
Attention 98
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Mastery learning 112
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Applied behavioral analysis 113

ISSUES AND PROBLEMS FOR DISCUSSION

ISSUES Here are some related issues for you to debate.

1. Which school of thought—cognitive, humanistic, or behavioral—seems best under what learning circumstances?
2. What seem to be the most critical findings about learning that you should know and apply?
3. How should teachers be held personally accountable for using what is known about learning?

PROBLEMS Following are some verbatim daily learning-related problems that teachers have shared with us. How does each relate to what we know about learning? How might you resolve them?

Problem 1: "Today, during a lesson on fractions, the class became rowdy. Since fractions seem especially difficult for them, they become frustrated. One of the girls blurted out, 'You can't make people learn who don't want to.'"

Problem 2: "The incident that caused me the greatest concern today happened during a reading class while working with a group of eight third-grade children. These children are unable to read or write above a first-grade level at best. The frustrating part is that they don't know words they have gone over and over before."

Problem 3: "Today I tried to teach the concepts of 'first, middle, and last' to the children in my kindergarten. Many approaches were used—three pictures placed on the chalkboard, three objects placed on the floor, three children standing behind each other in a line. Only a few got the concepts."

Problem 4: "The thing that bothered me today was brought to mind by something another middle-school teacher said in the faculty lounge. She stated that nearly all her students can read and spell but do not understand what they are reading or the meaning of words they are spelling. During the next few days, I paid attention to the teacher's comment when working with my students. Yes, they can read and spell words, but half the time they have little or no understanding."

Problem 5: "Many of the students I teach have very low self-esteem. They don't think much of themselves and have little confidence in their ability to learn or do anything. Some are just waiting to drop out."

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THEORY INTO ACTION: ACTIVITIES FOR PRACTICE AND YOUR PORTFOLIO

ACTIVITY 4.1: Cognitive Approaches

a. How do teachers use the cognitive approach? If you are assigned to a classroom, observe your mentor teacher and describe how he or she uses any of the following cognitive approaches and related beliefs or findings: authentic learning, scaffolding, reciprocal teaching, problem solving.

b. Plan and teach a reflective teaching lesson from the Practice Teaching Manual (Part Four of this book) in the most meaningful way.

ACTIVITY 4.2: Humanistic Approaches

a. How do teachers use the humanistic approach? If you are assigned to a classroom, observe the mentor teacher and describe how he or she uses *any* of the following approaches to learning: individualized-personalized instruction, greater self-directed learning and self-evaluation, creating a classroom wherein kids feel secure physically, socially and emotionally.

b. Plan and teach a reflective teaching lesson from Unit 2 of the Practice Teaching Manual.

ACTIVITY 4.3: Behavioral Approaches

a. How do teachers use the behavioral approach? If you are working in a school, observe your mentor teacher and describe how he or she uses any of the following or other behavioral approaches and related beliefs and findings: programmed instruction, computer-assisted instruction, mastery learning, precision teaching, applied behavioral analysis.

b. Plan and teach a reflective teaching lesson from Practice Teaching Manual according to principles from the behavioral school.

ACTIVITY 4.4: Which School of Learning Theory Most Appeals to You? Are you mostly a cognitivist, humanist, or behaviorist, or are you about evenly some of each? Below are twenty-one statements related to learning. Although you may agree with most or even all of them, pick only seven by placing seven check marks on the corresponding blanks. Then go to the key that follows to find out which school of thought each statement you checked is most closely related to.

_____ **1.** Students must make connections between new information and the information they already possess.

_____ **2.** Anxious students should be given successful academic and social experiences.

_____ **3.** Teachers should give greater attention to helping students learn more about themselves.

_____ **4.** New information must be logically organized and presented to students.

_____ **5.** Information presented to students should be associated with something they like or want.

_____ **6.** Students' behavior is mostly the result of their feelings of confidence, self-worth, and personal dignity.

_____ **7.** Students forget information unless they rehearse or think about it.

_____ **8.** Students should be made aware of specifically what they must know and be able to do at the end of instruction.

_____ **9.** Students should be encouraged to believe that they are academically and socially capable.

_____ **10.** Students should interact with teachers and be encouraged to ask questions.

_____ **11.** Reinforcement of appropriate student learning behavior is essential.

_____ **12.** Students should be given a secure environment in which they are encouraged to make wise academic and social choices.

_____ **13.** When students discover something on their own, they learn better.

_____ **14.** Students need to see other students and/or the teacher demonstrating appropriate learning behavior.

_____ **15.** Students should be accepted regardless of their school achievement, feelings, or other behavior.

_____ **16.** Students need to learn how to learn.

_____ **17.** Parents must reinforce their children's learning behavior.

_____ **18.** Students should learn to respect themselves and others.

_____ **19.** A most important goal of education is to help students become better problem solvers.

_____ **20.** Material to be learned should be presented in small, sequential steps.

_____ **21.** Students should be encouraged to pursue their own interests.

Key

Cognitively oriented statements are 1, 4, 7, 10, 13, 16, 19.
Behaviorally oriented statements are 2, 5, 8, 11, 14, 17, 20.
Humanistically oriented statements are 3, 6, 9, 12, 15, 18, 21.

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REFERENCES

Anderson, R., Reder, L. & Simon, H. (1996). Situated learning and education. *Educational Researcher, 25*(4), 5–11.

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice Hall.

Bransford, J., Brown, A., & Cooking, R. (2002). *How people learn.* Washington, DC: National Research Council, Bringing Real-World Problems to Classrooms, Box 9.1.

Brophy, J. (2003, June). An interview with Jere Brophy. *Educational Psychology Review, 15*(2), 195–204.

Bruer, J. (2003/2004). *In search of . . . brain-based education. Annual Editions: Educational Psychology*. Guilford, CT: McGraw-Hill/Dushkin.

Deci, E. & Ryan, R. (1990). A motivational approach to self. In R. Dienstbier (Ed.), *Nebraska symposium on*

motivation (pp. 240–250). Lincoln: University of Nebraska Press.
Dembo, M. H. (1994). *Applying educational psychology in the classroom.* New York: Addison-Wesley Longman.
DeRoche, S. (2006, May). An adventure in problem-based learning. *Educational Leadership, 87*(9), 705–708.
Dietrich, A. & Kanso, R. (2010, September). A review of EEG, ERP, and neuroimaging studies. *Psychological Bulletin, 136*(5), 822–848.
Durlak, J., Weissberg, R., Dymnicki, A., Taylor, R., Schellinger, K. (2011, December). The Impact of Enhancing Students' Social and Emotional Learning. *Child Development*, *82* (1): 405.
Gage, N. & Berliner, D. (1998). *Educational Psychology*. Florence, KY: Cengage Learning.
Gladwell, M. (2008). *Outliers*. New York: Little, Brown and Company.
Guskey, T. (2010, October). Mastery learning. *Educational Leadership, 68*(2), 53–57.
Hattie, J. (2009). *Visible learning*. New York, Routledge.
Harvard Education Letter online (2006, November/January). An interview with Ronald Ferguson: Recent research on the achievement gap. Access: www.edletter.org/current/ferguson.shtml
Kinchin, I. (2004, Winter). Investigating students' beliefs about their preferred role as learners. *Educational Research, 46*(3), 1–12.
Karpicke, J. & Blunt, J. (2011, February 11) Retrieval practice produces more learning. *Science, 331*(6018), 772–775.
Lickona, T. (2004). *Character matters*. New York: Touchstone.
Marzano, R., Pickering, D., & Pollock, J. (2001). *Classroom instruction that works.* Alexandria, VA: ASCD.
Maslow, A. H. (1998). *Toward a psychology of being*, Second Edition. New York: John Wiley.
Neill, A. S. (1969). *Summerhill: A radical approach to child rearing*. New York: Hart.
Nucci, L. (2008). *Nice is not enough*. Upper Saddle River, NJ: Prentice-Hall.
Palincsar, A. (1986). The role of dialogue in providing scaffolding instruction. *Educational Psychologist, 21*, 73–98.
Pashler, H. (2007). *Organizing Instruction and Study: A Practice Guide.* Washingtom: National Center For Educational Researchhttp://ies.ed.gov/ncee/wwc/practiceguide.aspx?s
Pillars, W. (2012, March 27). What neuroscience tells us about deepening learning. *Education Week Teacher: TLN Teacher Leaders Network* online. http://www.edweek.org/tm/articles/2012/03/27/tln_pillars_neuroscience.html
Purkey, W. W. & Novak, N. (2005). *Inviting school success*. Florence, KY: Cengage Learning.
Ragozzino, K., Resnik, H., Utne-O'Brien, M., & Weissberg, R. (2003, Summer). Promoting academic achievement through social and emotional learning. *Educational Horizons, 169*, 168–171.
Roediger, H. & Butler. (in press). Critical role of retrieval practice in long-term retention. *Cell Press* (TICS-917) online http://people.duke.edu/~ab259/pubs/Roediger&Butler(2010).pdf
Rogers, C. & Russell, D. (2002). *Carl Rogers*. Roseville, CA: Penmarin Books.
Ross, P. (2006, August). The expert mind. ScientificAmerican.com.
Samuels, C. (2006, November 8). Ed. Dept. backs research plans for RTI method. *Education Week Online*. http://www.edweek.org/ew/articles/2006/11/08/11rti.h26.html?qs=Ed.+Department+Backs+research+plans
Samuels, C. (2006, November 8). Ed. Dept. backs research plans for RTI method. *Education Week Online.* http://www.edweek.org/ew/articles/2006/11/08/11rti.h26.html?qs=Ed.+Department+Backs+research+plans
Schunk, D. (2008). *Learning Theories*. Upper Saddle River, NJ: Prentice-Hall.
Science Daily. (2010, October 15), *How Practice Tests Improve Memory*. http://www.sciencedaily.com/.releases/2010/10/101014144235.htm
Seymour, R. & Osana, H. (2003). Reciprocal teaching procedures and principles. *Teaching and Teacher Education, 19*(3), 325–344.
Simon, S. B., Howe, L. W., & Kerschenbaum, H. (1995). *Values clarification. Practical strategies for teachers and students*. New York: Warner Books.
Snowman, J, McCown, R. & Biehler, R. F. (2011). *Psychology applied to teaching*, Belmont, CA: Wadsworth
Strauss, V. (2001, March 13). Brain research oversold, experts say. *Washington Post*, p. B6.
Viadero, D. (1996, May 22). Debate over how children learn is reignited. *Education Week, 15*(35), 5.
Walberg, H. J. (1986). Synthesis of research on teaching. In M. C. Wittrock (Ed.), *Handbook of research on teaching* (pp. 214–229). New York: Macmillan.
Willingham, D. (2004, Spring). Practice makes perfect: But only if you practice beyond the point of perfection. *American Educator Online*.
Willingham, D. (2013, May-June). in Advancing the science and art of teaching. *Harvard Magazine online* http://harvardmagazine.com/2013/05/harvard-iearning-and-teaching-innovations
Willis, J. V. (2007, May). Which brain research can educators trust? *Phi Deltan Kappan, 88*(2), 699.
Wirkala, C. & Kuhn, D. (2011, October). Problem-based learning in K-12 education. *American Educational Research Journal, 48* (5), 1157–1186.
Wolfe, P. (2001). *Brain matters: Translating research into classroom practice*. Alexandria, VA: Association for Supervision and Curriculum Development.

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