Social Cognitive and Constructivist Views of Learning
You have finally landed a job teaching English and writing in a high school. The first day of class, you discover that a number of students appear to have limited English proficiency. You make a mental note to meet with them to determine how much and what kind of reading they can handle. To get a sense of the class’s interest, you ask them to write a “review” of the last book they read, as if they were on TV doing a “Book Beat” program. There is a bit of grumbling, but the students seem to be writing, so you take a few minutes to try to talk with one of the students who has trouble with English.

That night you look over the “book reviews.” Either the students are giving you a hard time, or no one has read anything lately. Several students mention a text from another class, but their reviews are one-sentence evaluations—usually containing the words “lame” or “useless” (often misspelled). In stark contrast are the papers of three students—they are a pleasure to read, worthy of publication in the school literary magazine (if there were one), and reflect a fairly sophisticated understanding of some good literature.

**Critical Thinking**

*How would you adapt your plans for this group?*

*What will you do tomorrow? What teaching approaches do you think will work with this class?*

*How will you work with the three students who are more advanced?*

**Collaboration**

With two or three other students in your class, redesign the assignment to get students more engaged. How could you prepare them to use what they know to succeed on this assignment?

For the past three chapters we have analyzed different aspects of learning. We considered behavioral and information processing explanations of what and how people learn. We have examined complex cognitive processes such as concept learning and problem solving. These explanations of learning focus on the individual and what is happening in his or her “head.” Recent perspectives have called attention to two other aspects of learning that are critical—social and cultural factors. In this chapter we look at the role of other people and the cultural context in learning.

Two general theoretical frames include social and cultural factors as major elements. The first, social learning/social cognitive views, began as an extension and expansion of behavioral theories. The second, sociocultural constructivist theories, have roots in cognitive perspectives. Rather than debating the merits of each approach, we will consider the contributions of different models of instruction, grounded in different theories of learning. Don’t feel that you must choose the “best” approach—there is no such thing. Even though theorists argue about which model is best, most excellent teachers apply all the approaches as appropriate.

By the time you have completed this chapter, you should be able to answer these questions:

- What are the elements of social cognitive theory?
- In what situations might a teacher use modeling?
- What are three constructivist perspectives on learning?
- How could you incorporate inquiry, problem-based learning, instructional conversations, and cognitive apprenticeships in your teaching?
Social Processes in Learning

When you consider the English class in the Teachers’ Casebook, do you think about social and cultural influences on the students’ learning? Reading and books seem to have very different meanings for various students in the class. And the students probably have seen different models of reading in their lives outside school. In the following pages, we will discuss how people learn through interactions with others and how observation, modeling, dialogue, and culture affect learning—all are increasingly important topics in educational psychology. Over as decade ago, Jerome Bruner, who pioneered the study of individual concept learning, said, “I have come increasingly to recognize that learning in most settings is a communal activity, a sharing of culture” (1986, p. 27).

Let’s consider three social influences on students—parents, peers, and teachers.

Parents, Peers, and Teachers

Think back to high school—did you have friends in any of these groups: normals, populars, brains, jocks, partyers, druggies, others? What were the main “crowds” at your school? How did your friends influence you?

Laurence Steinberg and his colleagues have studied the role of parents, peers, and community contexts in school achievement (Steinberg, 1998, 1996; Durbin, Darling, Steinberg, & Brown, 1993). Based on a three-year study that surveyed 20,000 students in nine high schools in Wisconsin and California, Steinberg concluded that about 40% of these students were just going through the motions of learning. When they were in class, they were not really paying attention or trying very hard to learn. About 90% had copied someone else’s homework and 66% had cheated on a test within the last year. Steinberg claims that this lack of investment is due in part to peer pressure. “For a large number of adolescents, peers—not parents—are the chief determinants of how intensely they are invested in school and how much effort they devote to their education” (1998, p. 331). Results of his research indicate that peers provide incentives for certain activities and ridicule others, which creates a school culture that affects the way the teachers behave. One in every five students said that their friends make fun of people who tried to do well in school. When asked what crowd they would most like to belong to:

[Five times as many students say the “populars” or “jocks” as say the “brains.” Three times as many say they would rather be “partyers” or “druggies” than “brains.” And of all the crowds, the “brains” were least happy with who they are—nearly half wished they were in a different crowd. (Steinberg, 1998, p. 332)]

But parents and teachers play a role too. When 3,407 9th- through 12th-grade European American students described their parents’ styles and their peer-group orientation, adolescents who characterized their parents as authoritative (demanding but responsive, rational, and democratic) were more likely to favor well-rounded crowds that rewarded both adult- and peer-supported norms such as “normals” and “brains.” Students, especially girls, who characterized their parents as uninvolved were more likely to be oriented toward “partyers” and “druggies” that did not endorse adult values. Finally, boys with indulgent parents were more likely to be oriented toward fun-cultures such as “partyers” (Durbin, Darling, Steinberg, & Brown, 1993). In fact, adolescents with authoritative parents are more likely to respond to peer pressure to do well in school and less
likely to be swayed by peer pressure to use drugs or alcohol, especially when their friends also have authoritative parents (Collins, Maccoby, Steinberg, Hetherington, & Bornstein, 2000).

Children are not randomly assigned to friendship groups, cliques, and crowds. In elementary school, children tend to select friends who share their orientation toward school (Wentzel, 1999). A study by Jill Hamm (2000) comparing friendship patterns of African, Asian, and European American adolescents found that all three groups chose friends who were similar (but not identical) in substance use and somewhat similar in academic orientation. African Americans were more likely than the other two groups to select friends who were similar in terms of ethnic identity, however.

There also is some evidence that academic achievement is less valued in African American peer groups than in Asian or European American groups (Steinberg, Dornbusch, & Brown, 1992; Wentzel & Battle, 2001). But we have to be careful about research that overlooks possible individual and group differences. For example, when European, Hispanic, and African American adolescents were asked to nominate peers they most admired, respected, and wanted to be like, girls in all three groups and European American boys nominated high achieving peers. In contrast, African American and Hispanic American boys nominated low achieving boys as most admired (Graham, Taylor, & Hudley, 1998).

When children do not have friends or have few friends, parents and teachers can play an important role in supporting school achievement. Kathryn Wentzel and her colleagues have found that perceived support from teachers is related to positive motivation for learning and adjustment in school for students (Wentzel & Battle, 2001). In addition, being liked by teachers can offset the negative effects of peer rejection in middle school. And students who have few friends, but are not rejected—simply ignored by other students—can remain well-adjusted academically and socially when they are liked and supported by teachers. Often these students are highly motivated to learn (Wentzel, 1999). See the Stories of Learning/Tributes to Teaching feature on page 316 for one example.

**What are some of the social factors that influence learning in school?**

Observation and modeling play a role in peer influence. The first perspective we will examine that adds social considerations to an explanation of learning is the work of Albert Bandura (1977, 1986, 1997). In the early 1960s he demonstrated that people can learn by observing the actions and consequences of others.

### Social Learning and Social Cognitive Theories

Bandura's early work on learning was grounded in the behavioral principles of reinforcement and punishment described in Chapter 6. However, Bandura challenged and expanded behavioral conceptions of learning. He believed that the traditional behavioral views were accurate—but incomplete—because they gave only a partial explanation of learning. Behavioral views overlooked important elements, particularly the social influences on learning. Bandura's early work focused on social behaviors, and was labeled social learning theory; it was considered a neobehavioral approach (Bandura, 1977; Hill, 2002).

To explain some limitations of the behavioral model, Bandura distinguishes between the acquisition of knowledge (learning) and the observable performance based on that knowledge (behavior). In other words, Bandura suggests that we all may know more than we show. An example is found in one of Bandura's early studies (1963). Preschool children saw a film of a model kicking and punching an inflatable "Bobo" doll. One group saw the model rewarded for the aggression, another group saw the...
The impact of teachers has been captured powerfully in works of fiction. The following story shows both the impact of teachers and the dangers of acting on negative expectations (discussed in Chapter 12). It is adapted from a longer version of this story, available at http://www.saintjohnonline.com/centennialschool/oa_inspirations.html. The teacher, Miss Thompson, encountered Teddy in her second year of teaching fifth grade. He was dirty and had a strange smell. He fell further and further behind. She remembered:

While I did not actually ridicule the boy, my attitude was obviously quite apparent to the class, for he quickly became the class "goat," the outcast: the unlovable and the unloved. He knew I didn't like him, but he didn't know why. . . All I know is that he was a little boy no one cared about, and I made no effort on his behalf. I knew that Teddy would never catch up in time to be promoted to the sixth grade level. To justify myself, I went to his cumulative folder. First grade: Teddy shows promise by work and attitude, but has poor home situation. Second grade: Teddy could do better. Mother terminally ill. He receives little help at home. Third grade: Teddy is a pleasant boy. Helpful, but too serious. Slow learner. Mother passed away end of the year. Fourth grade: Very slow, but well behaved. Father shows no interest. Well, they had passed him four times, but he will certainly repeat fifth grade. Do him good! I said to myself. And then the last day before the holiday arrived. Many gifts were heaped underneath our little tree, waiting for the big moment. . . As I removed the last bit of masking tape from the brown paper on Teddy's gift, two items fell to my desk: a gaudy rhinestone bracelet with several stones missing and a small bottle of dime-store cologne half empty.

I could hear the snickers and whispers as I placed the bracelet on my wrist. "Teddy, would you help me fasten it?" He smiled shyly as he fixed the clasp, and I held up my wrist for all of them to admire. There were a few hesitant oohs and aahs, but as I dabbed the cologne behind my ears, all the little girls lined up for a dab behind their ears.

When all the students had left, Teddy walked up to me. "You smell just like my mom," he said softly. "Her bracelet looks real pretty on you, too. I'm glad you liked it." He left quickly. I locked the door, sat down at my desk, and wept, resolving to make up to Teddy what I had deliberately deprived him of—a teacher who cared. I stayed every afternoon with Teddy from the end of holidays until the last day of school. Sometimes we worked together. Sometimes he worked alone while I drew up lesson plans or graded papers. Slowly but surely he caught up with the rest of the class. In fact, his final averages were among the highest in the class.

I did not hear from Teddy until seven years later, when his first letter appeared in my mailbox:

"Dear Miss Thompson,
I just wanted you to be the first to know, I will be graduating second in my class next month.

Very Truly Yours, Teddy Stallard"

Four years later, Teddy's second letter came.

"Dear Miss Thompson, I wanted you to be the first to know. I was just informed that I will be graduating first in my class. The university has not been easy, but I liked it. Very Truly Yours, Teddy Stallard"

And now today, Teddy's third letter.

"Dear Miss Thompson, I wanted you to be the first to know. As of today I am Theodore Stallard, M.D. How about that!!! I'm going to be married in July, the 27th, to be exact. I wanted to ask if you could come and sit where Mom would sit if she were here. I'll have no family there as Dad died last year.

Very Truly Yours, Teddy Stallard"

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form badly on a test because they are anxious or ill or have misread the problem. In both cases, their performance is not an indication of their learning.

Recently, Bandura has focused on cognitive factors such as beliefs, self-perceptions, and expectations, so his theory is now called a **social cognitive theory** (Hill, 2002). Social cognitive theory distinguishes between enactive and vicarious learning. **Enactive learning** is learning by doing and experiencing the consequences of your actions. This may sound like operant conditioning all over again, but it is not, and the difference has to do with the role of consequences. Proponents of operant conditioning believe that consequences strengthen or weaken behavior. In enactive learning, however, consequences are seen as providing information. Our interpretations of the consequences create expectations, influence motivation, and shape beliefs (Schunk, 2000). We will see examples of enactive learning—learning by doing—later in the chapter when we consider inquiry and problem-based learning.

**Vicarious learning** is learning by observing others. People and animals can learn merely by observing another person or animal learn, and this fact challenges the behaviorist idea that cognitive factors are unnecessary in an explanation of learning. If people can learn by watching, they must be focusing their attention, constructing images, remembering, analyzing, and making decisions that affect learning. Thus, much is going on mentally before performance and reinforcement can even take place. Cognitive apprenticeships, discussed later in the chapter, are examples of vicarious learning—learning by observing others.

### Learning by Observing Others

**STOP**

Your interview for a position in the middle school is going well. The next question is: "Who are your models as teachers? Do you hear yourself saying or see yourself doing things that other teachers have done? Are there teachers from films or books that you would like to be like?"

**THINK**

Through **observational learning** we learn not only how to perform a behavior but also what will happen to us in specific situations if we do perform it. Observation can be a very efficient learning process. The first time children hold hairbrushes, cups, or tennis rackets, they usually brush, drink, or swing as well as they can, given their current muscle development and coordination. Let’s take a closer look at how observational learning occurs. Bandura (1986) notes that observational learning includes four elements: paying attention, retaining information or impressions, producing behaviors, and being motivated to repeat the behaviors.

**WRITE**

**Attention.** In order to learn through observation, we have to pay attention. In teaching, you will have to ensure students’ attention to the critical features of the lesson by making clear presentations and highlighting important points. In demonstrating a skill (for example, threading a sewing machine or operating a lathe), you may need to have students look at your shoulder as you work. Seeing your hands from the same perspective as they see their own directs their attention to the right features of the situation and makes observational learning easier.

**Retention.** In order to imitate the behavior of a model, you have to remember it. This involves mentally representing the model’s actions in some way, probably as verbal steps ("Hwa-Rang, the eight form in Tae Kwan Do karate, is a palm-heel block, then a middle riding stance punch, then . . ."). Or as visual images, or both. Retention can be improved by mental rehearsal (imagining imitating the behavior) or by actual practice. In the retention phase of observational learning, practice helps us remember the elements of the desired behavior, such as the sequence of steps.

**Production.** Once we “know” how a behavior should look and remember the elements or steps, we still may not perform it smoothly. Sometimes we need a great deal of practice, feedback, and coaching about subtle points before we can reproduce the
behavior of the model. In the production phase, practice makes the behavior smoother and more expert.

**Motivation and Reinforcement.** As mentioned earlier, social learning theory distinguishes between acquisition and performance. We may acquire a new skill or behavior through observation, but we may not perform that behavior until there is some motivation or incentive to do so. Reinforcement can play several roles in observational learning. If we anticipate being reinforced for imitating the actions of a model, we may be more motivated to pay attention, remember, and reproduce the behaviors. In addition, reinforcement is important in maintaining learning. A person who tries a new behavior is unlikely to persist without reinforcement (Ollendick, Dailey, & Shapiro, 1983; Schunk, 2000). For example, if an unpopular student adopted the dress of the “in” group but was ignored or ridiculed, it is unlikely that the imitation would continue.

Bandura identifies three forms of reinforcement that can encourage observational learning. First, of course, the observer may reproduce the behaviors of the model and receive direct reinforcement, as when a gymnast successfully executes a front flip/round-off combination and the coach/model says, “Excellent!”

But the reinforcement need not be direct—it may be *vicarious reinforcement.* The observer may simply see others reinforced for a particular behavior and then increase his or her production of that behavior. For example, if you compliment two students on the attractive illustrations in their lab reports, several other students who observe your compliments may turn in illustrated lab reports next time. Most TV ads hope for this kind of effect. People in commercials become deliriously happy when they drive a particular car or drink a specific juice, and the viewer is supposed to do the same; the viewer’s behavior is reinforced vicariously by the actors’ obvious pleasure. Punishment can also be vicarious: You may slow down on a stretch of highway after seeing several people get speeding tickets there.

The final form of reinforcement is self-reinforcement or controlling your own reinforcers. This sort of reinforcement is important for both students and teachers. We want our students to improve not because it leads to external rewards but because the students value and enjoy their growing competence. And as a teacher, sometimes self-reinforcement is all that keeps you going.

**Factors That Influence Observational Learning.** What causes an individual to learn and perform modeled behaviors and skills? Several factors play a role, as shown in Table 9.1. The developmental level of the observer makes a difference in learning. As children grow older, they are able to focus attention for longer periods of time, use memory strategies to retain information, and motivate themselves to practice. A second influence is the status of the model. Children are more likely to imitate the actions of others who seem competent, powerful, prestigious, and enthusiastic. So parents, teachers, older siblings, athletes, action heroes, rock stars, or film personalities may serve as models, depending on the age and interests of the child. Third, by watching others, we learn about what behaviors are appropriate for people like ourselves, so models who are seen as similar are more readily imitated (Pintrich & Schunk, 2002). All students need to see successful, capable models who look and sound like them, no matter what their ethnicity, socioeconomic status, or gender.

Look at Table 9.1. The last three influences involve goals and expectations. If observers expect that certain actions of models will lead to particular outcomes (such as particular practice regimens leading to improved athletic performance) and the observers value those outcomes or goals, then the observers are more likely to pay atten-
### Characteristic Effects of Modeling

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developmental Status</td>
<td>Improvements with development include longer attention and increased capacity to process information, use strategies, compare performances with mental representations, and adopt intrinsic motivators.</td>
</tr>
<tr>
<td>Model Prestige and Competence</td>
<td>Observers pay greater attention to competent, high-status models. Consequences of modeled behaviors convey information about functional value. Observers attempt to learn actions they believe they will need to perform.</td>
</tr>
<tr>
<td>Vicarious Consequences</td>
<td>Consequences to models convey information about behavioral appropriateness and likely outcomes of actions. Valued consequences motivate observers. Similarity in attributes or competence signals appropriateness and heightens motivation.</td>
</tr>
<tr>
<td>Outcome Expectations</td>
<td>Observers are more likely to perform modeled actions they believe are appropriate and will result in rewarding outcomes.</td>
</tr>
<tr>
<td>Goal Setting</td>
<td>Observers are likely to attend to models who demonstrate behaviors that help observers attain goals.</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>Observers attend to models when they believe they are capable of learning or performing the modeled behavior. Observation of similar models affects self-efficacy (&quot;If they can do it, I can too&quot;).</td>
</tr>
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...tion to the models and try to reproduce their behaviors. Finally, observers are more likely to learn from models if the observers have a high level of self-efficacy—that is, if they believe they are capable of doing the actions needed to reach the goals, or at least of learning how to do so (Bandura, 1997; Pintrich & Schunk, 2002). We will discuss goals, expectations, and self-efficacy in greater depth in Chapter 10 on motivation.

### Observational Learning in Teaching

**STOP**

How would you incorporate observational learning into your teaching?

**THINK**

What are the skills, attitudes, and strategies in your subject that can be modeled?

**WRITE**

There are five possible outcomes of observational learning: directing attention, encouraging existing behaviors, changing inhibitions, teaching new behaviors and attitudes, and arousing emotions. Let’s look at each of these as they occur in classrooms.

**Directing Attention.** By observing others, we not only learn about actions, but also notice the objects involved in the actions. For example, in a preschool class, when one child plays enthusiastically with a toy that has been ignored for days, many other children may want to have the toy, even if they play with it in different ways or simply carry it around. This happens, in part, because the children’s attention has been drawn to that particular toy.

**Fine-Tuning Already-Learned Behaviors.** All of us have had the experience of looking for cues from other people when we find ourselves in unfamiliar situations. Observing the behavior of others tells us which of our already-learned behaviors to use: the proper fork for eating the salad, when to leave a gathering, what kind of language is appropriate, and so on. Adopting the dress and grooming styles of TV or music idols is another example of this kind of effect.

Self-efficacy A person’s sense of being able to deal effectively with a particular task.
**Strengthening or Weakening Inhibitions.** If class members witness one student breaking a class rule and getting away with it, they may learn that undesirable consequences do not always follow rule breaking. If the rule breaker is a well-liked, high-status class leader, the effect of the modeling may be even more pronounced. This "ripple effect" (Kounin, 1970) can work for the teacher’s benefit. When the teacher deals effectively with a rule breaker, especially a class leader, the idea of breaking this rule may be inhibited for the other students viewing the interaction. This does not mean that teachers must reprimand each student who breaks a rule, but once a teacher has called for a particular action, following through is an important part of capitalizing on the ripple effect.

**Teaching New Behaviors.** Modeling has long been used, of course, to teach dance, sports, and crafts, as well as skills in subjects such as food science, chemistry, and shop. Modeling can also be applied deliberately in the classroom to teach mental skills and to broaden horizons—to teach new ways of thinking. Teachers serve as models for a vast range of behaviors, from pronouncing vocabulary words, to reacting to the seizure of a student with epilepsy, to being enthusiastic about learning. For example, a teacher might model sound critical thinking skills by thinking "out loud" about a student’s question. Or a high school teacher concerned about girls who seem to have stereotyped ideas about careers might invite women with nontraditional jobs to speak to the class.

Modeling, when applied deliberately, can be an effective and efficient means of teaching new behavior (Bandura, 1986; Schunk, 1987, 2000). Studies indicate that modeling can be most effective when the teacher makes use of all the elements of observational learning described in the previous section, especially reinforcement and practice.

Models who are the same age as the students may be particularly effective. For example, Schunk and Hanson (1985) compared two methods for teaching subtraction to 2nd graders who had difficulties learning this skill. One group of students observed other 2nd graders learning the procedures, then participated in an instructional program on subtraction. Another group of students watched a teacher’s demonstration, then participated in the same instructional program. Of the two groups, the students who observed peer models learning not only scored higher on tests of subtraction after instruction, but also gained more confidence in their own ability to learn. For students who doubt their own abilities, a good model is a low-achieving student who keeps trying and finally masters the material (Schunk, 2000).

**Arousing Emotion.** Finally, through observational learning people may develop emotional reactions to situations they have never experienced personally, such as flying or driving. A child who watches a friend fall from a swing and break an arm may become fearful of swings. After the terrible events of September 11th, children may be anxious when they see airplanes flying close to the ground. News reports of shark attacks have many of us anxious about swimming in the ocean. Note that hearing and reading about a situation are also forms of observation. Some typical examples of modeling occur with "copy cat killings" in schools. When frightening things happen to people who are similar in age or circumstances to your students, they may need to talk about their emotions.

The Guidelines on the next page will give you some ideas about using observational learning in the classroom.

**Reciprocal Determinism**

In social cognitive theory both internal and external factors are important. Environmental events, personal factors, and behaviors are seen as interacting in the process of learning. Personal factors (beliefs, expectations, attitudes, and knowledge), the physical and social environment (resources, consequences of actions, other people, and physical settings), and behavior (individual actions, choices, and verbal state-
GUIDELINES

Model behaviors and attitudes you want your students to learn.

Examples

1. Show enthusiasm for the subject you teach.
2. Be willing to demonstrate both the mental and the physical tasks you expect the students to perform. I once saw a teacher sit down in the sandbox while her 4-year-old students watched her demonstrate the difference between “playing with sand” and “throwing sand.”
3. When reading to students, model good problem solving. Stop and say, “Now let me see if I remember what happened so far,” or “That was a hard sentence. I’m going to read it again.”
4. Model good problem solving—think out loud as you work through a difficult problem.

Use peers, especially class leaders, as models.

Examples

1. In group work, pair students who do well with those who are having difficulties.
2. Ask students to demonstrate the difference between “whispering” and “silence—no talking.”

Make sure students see that positive behaviors lead to reinforcement for others.

Examples

1. Point out the connections between positive behavior and positive consequences in stories.
2. Be fair in giving reinforcement. The same rules for rewards should apply to the problem students as to the good students.

Enlist the help of class leaders in modeling behaviors or the entire class.

Examples

1. Ask a well-liked student to be friendly to an isolated, fearful student.
2. Let high-status students lead an activity when you need class cooperation or when students are likely to be reluctant at first. Popular students can model dialogues in foreign-language classes or be the first to tackle dissection procedures in biology.

ments) all influence and are influenced by each other. Bandura calls this interaction of forces reciprocal determinism.

Figure 9.1 (page 322) shows the interaction of person, environment, and behaviors in learning settings (Schunk, 1999). Social factors such as models, instructional strategies, or feedback (elements of the environment for students) can affect student personal factors such as goals, sense of efficacy for the task, attributions (beliefs about causes for success and failure), and processes of self-regulation such as planning, monitoring, and controlling distractions. For example, teacher feedback can lead students to set higher goals and increase their sense of efficacy. Social influences in the environment and personal factors encourage behavioral growth such as persistence and effort (motivation) and learning. But these behaviors also reciprocally impact personal factors. As students achieve, their sense of self-efficacy increases, for example. And behaviors also affect the social environment. For example, if students do not persist or if they seem to misunderstand, teachers may change instructional strategies or feedback.

Think for a minute about the power of reciprocal determinism in classrooms. If personal factors, behaviors, and the environment are in constant interaction, then cycles of events are progressive and self-perpetuating. Suppose a new student walks into class late. The student has a tattoo and several visible pierced body parts. The student is actually anxious and hopes to do better at this new school, but the teacher’s initial reaction to the late entry and dramatic appearance is a bit hostile. The student feels insulted and responds in kind, so the teacher begins to form expectations about the student, is more vigilant and less trusting, and the student decides that this school will be just as worthless as his previous one—so why bother to try. The teacher sees the student’s disengagement, invests less effort in teaching him, and the cycle continues.

Distinguish between social learning and social cognitive theories.

Distinguish between active and vicarious learning.

What are the elements of observational learning?

What is reciprocal determinism?

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Figure 9.1 Reciprocal Influences

Social cognitive theories study the impact of social factors on individuals—the direction of the influence is from social processes outside the learner to the mind inside the learner. But there are other perspectives on learning that include a much wider range of social processes, such as cultural and historical factors, and focus on co-constructions of knowledge that occur between people, not just within them. Because these are very influential theories, we will spend the rest of the chapter learning more about them.

Constructivism and Situated Learning

Consider this situation:

A young child who has never been to the hospital is in her bed in the pediatric wing. The nurse at the station down the hall calls over the intercom above the bed, “Hi Chelsea, how are you doing? Do you need anything?” The girl looks puzzled and does not answer. The nurse repeats the question with the same result. Finally, the nurse says emphatically, “Chelsea, are you there? Say something!” The little girl responds tentatively, “Hello wall—I’m here.”

Chelsea encountered a new situation—a talking wall. The wall is persistent. It sounds like a grown-up wall. She shouldn’t talk to strangers, but she is not sure about walls. She uses what she knows and what the situation provides to construct meaning and to act.

Here is another example of constructing meaning taken from Berk (2001, p. 31). This time a father and his 4-year-old son co-construct understandings as they walk along a California beach, collecting litter after a busy day:

Ben: (running ahead and calling out) Some bottles and cans. I’ll get them.

Me: If the bottles are broken, you could cut yourself, so let me get them.

(Catches up and holds out the bag as Ben drops items in)
Ben: Dad, look at this shell. It's a whole one, really big. Colors all inside!
Mel: Hmmm, might be an abalone shell.
Ben: What's abalone?
Mel: Do you remember what I had in my sandwich on the wharf yesterday? That's abalone.
Ben: You eat it?
Mel: Well, you can, You eat a meaty part that the abalone uses to stick to rocks.
Ben: Ewww. I don't want to eat it. Can I keep the shell?
Mel: I think so. Maybe you can find some things in your room to put in it.
(Points to the shell's colors) Sometimes people make jewelry out of these shells.
Ben: Like mom's necklace?
Mel: That's right. Mom's necklace is made out of a kind of abalone with a very colorful shell—pinks, purples, blues. It's called Paua. When you turn it, the colors change.
Ben: Wow! Let's look for Paua shells!
Mel: You can't find them here, only in New Zealand.
Ben: Where's that? Have you been there?
Mel: No, someone brought Mom the necklace as a gift. But I'll show you New Zealand on the globe. It's far away, halfway around the world.

Look at the knowledge being co-constructed about sea creatures and their uses for food or decoration, safety, environmental responsibility, and even geography. Constructivist theories of learning focus on how people make meaning, both on their own like Chelsea and in interaction with others like Ben.

**Constructivist Views of Learning**

Constructivism, "a vast and woolly area in contemporary psychology, epistemology, and education" (Von Glasersfeld, 1997, p. 204), is a broad term used by philosophers, curriculum designers, psychologists, educators, and others. Most people who use the term emphasize "the learner's contribution to meaning and learning through both individual and social activity" (Bruning, Schraw, & Ronning, 1999, p. 215). Constructivist perspectives are grounded in the research of Piaget, Vygotsky, the Gesell psychologists, Bartlett, and Bruner as well as the educational philosophy of John Dewey, to mention just a few intellectual roots.

There is no one constructivist theory of learning. Most of the theories in cognitive science include some kind of constructivism because these theories assume that individuals construct their own cognitive structures as they interpret their experiences in particular situations (Palincsar, 1998). There are constructivist approaches in science and mathematics education, in educational psychology and anthropology, and in computer-based education. Even though many psychologists and educators use the term constructivism, they often mean very different things (Marshall, 1996; McCaslin & Hickey, 2001; Phillips, 1997). One way to organize constructivists views is to talk about two forms of constructivism: psychological and social construction (Palincsar, 1998; Phillips, 1997).

**Psychological/Individual Constructivism.** Psychological constructivists "are concerned with how individuals build up certain elements of their cognitive or emotional apparatus" (Phillips, 1997, p. 153). These constructivists are interested in individual knowledge, beliefs, self-concept, or identity, so they are sometimes called individual constructivists; they all focus on the inner psychological life of people.

Chelsea talking to the wall in the previous section was making meaning using her own individual knowledge and beliefs.

**TO THE RESEARCH**
Using these standards, the most recent information processing theories are constructivist (Mayer, 1996). Information processing approaches to learning regard the human mind as a symbol processing system. This system converts sensory input into symbol structures (propositions, images, or schemas), and then processes (rehearses or elaborates) those symbol structures so knowledge can be held in memory and retrieved. The outside world is seen as a source of input, but once the sensations are perceived and enter working memory, the important work is assumed to be happening “inside the head” of the individual (Schunk, 2000; Vera & Simon, 1993). Some psychologists, however, believe that information processing is “trivial constructivism” because the individual’s only constructive contribution is to build accurate representations of the outside world (Derry, 1992; Garrison, 1995; Marshall, 1996).

In contrast, Piaget’s psychological constructivist perspective is less concerned with “correct” representations and more interested in meaning as constructed by the individual. As we saw in Chapter 2, Piaget proposed a sequence of cognitive stages that all humans pass through. Thinking at each stage builds on and incorporates previous stages as it becomes more organized and adaptive and less tied to concrete events. Piaget’s special concern was with logic and the construction of universal knowledge that cannot be learned directly from the environment—knowledge such as conservation or reversibility (Miller, 2002). Such knowledge comes from reflecting on and coordinating our own cognitions or thoughts, not from mapping external reality. Piaget saw the social environment as an important factor in development, but did not believe that social interaction was the main mechanism for changing thinking (Moshman, 1997). Some educational and developmental psychologists have referred to Piaget’s kind of constructivism as “first wave constructivism” or “solo” constructivism, with its emphasis on individual meaning-making (DeCorte, Greer, and Verschaffel, 1996; Paris, Bynner, & Paris, 2001).

**Vygotsky’s Social Constructivism.** As you also saw in Chapter 2, Vygotsky believed that social interaction, cultural tools, and activity shape individual development and learning, just as Ben’s interactions on the beach with his father shaped Ben’s learning about sea creatures, safety, environmental responsibility, and geography. By participating in a broad range of activities with others, learners appropriate (internalize or take for themselves) the outcomes produced by working together; “they acquire new strategies and knowledge of the world and culture” (Palincsar, 1998, pp. 351–352). Putting learning in social and cultural context is “second wave” constructivism (Paris, Bynner, & Paris, 2001).

Because his theory relies heavily on social interactions and the cultural context to explain learning, most psychologists classify Vygotsky as a social constructivist (Palincsar, 1998; Prawat, 1996). However, some theorists categorize him as a psychological constructivist because he was primarily interested in development within the individual (Moshman, 1997; Phillips, 1997). In a sense, Vygotsky was both. One advantage of his theory of learning is that it gives us a way to consider both the psychological and the social: He bridges both camps. For example, Vygotsky’s concept of the zone of proximal development—the area where a child can solve a problem with the help (scaffolding) of an adult or more able peer—has been called a place where culture and cognition create each other (Cole, 1985). Culture creates cognition when the adult uses tools and practices from the culture (language, maps, computers, looms, or music) to steer the child toward goals the culture values (reading, writing, weaving, dance). Cognition creates culture as the adult and child together generate new practices and problem solutions to add to the cultural group’s repertoire (Serpell, 1993).
The term *constructionism* is sometimes used to talk about how public knowledge is created. Although this is not our main concern in educational psychology, it is worth a quick look.

**Constructionism.** Social constructionists do not focus on individual learning. Their concern is how public knowledge in disciplines such as science, math, economics, or history is constructed. Beyond this kind of academic knowledge, constructionists also are interested in how common-sense ideas, everyday beliefs, and commonly held understandings about the world are communicated to new members of a sociocultural group (Gergen, 1997; Phillips, 1997). Questions raised might include who determines what constitutes history, the proper way to behave in public, or how to get elected class president. All knowledge is socially constructed, and, more important, some people have more power than others to define what constitutes such knowledge. Relationships between and among teachers, students, families, and the community are the central issues. Collaboration to understand diverse viewpoints is encouraged, and traditional bodies of knowledge often are challenged (Gergen, 1997). Vygotsky’s theory, with its attention to how cognition creates culture, has some elements in common with constructionism.

A difficulty with this position is that, when pushed to the extreme of relativism, all knowledge and all beliefs are equal because they are all constructed. There are problems with this thinking for educators. First, teachers have a professional responsibility to emphasize some values, such as honesty or justice, over others such as bigotry and deception. All beliefs are not equal. As teachers, we ask students to work hard to learn. If learning cannot advance understanding because all understandings are equally good, then, as David Moshman (1997) notes, “we might just as well let students continue to believe whatever they believe” (p. 230). Also, it appears that some knowledge, such as counting and one-to-one correspondence, is not constructed but universal. Knowing one-to-one correspondence is part of being human (Geary, 1995; Schunk, 2000).

These different perspectives on constructivism raise some general questions and disagree on the answers. These questions can never be fully resolved, but different theories tend to favor different positions.

**How Is Knowledge Constructed?**

One tension among different approaches to constructivism is based on how knowledge is constructed. Moshman (1982) describes three explanations.

1. **The realities and truths of the external world direct knowledge construction.** Individuals reconstruct outside reality by building accurate mental representations such as propositional networks, concepts, cause-and-effect patterns, and condition-action production rules that reflect “the way things really are.” Information processing holds this view of knowledge (Cobb & Bowers, 1999).

2. **Internal processes such as Piaget’s organization, assimilation, and accommodation direct knowledge construction.** New knowledge is abstracted from old knowledge. Knowledge is not a mirror of reality, but rather an abstraction that grows and develops with cognitive activity. Knowledge is not true or false; it just grows more internally consistent and organized with development.

3. **Both external and internal factors direct knowledge construction.** Knowledge grows through the interactions of internal (cognitive) and external (environmental and social) factors. Vygotsky’s description of cognitive development through the appropriation and use of cultural tools such as language is consistent with this view (Bruning, Schraw, & Ronning, 1999). Another example is Bandura’s theory of reciprocal interactions among people, behaviors, and environments (Schunk, 2000). Table 9.2 on page 326 summarizes the three general explanations about how knowledge is constructed.
Table 9.2  How Knowledge Is Constructed

<table>
<thead>
<tr>
<th>Type</th>
<th>Assumptions about Learning and Knowledge</th>
<th>Example Theories</th>
</tr>
</thead>
<tbody>
<tr>
<td>External Direction</td>
<td>Knowledge is acquired by constructing a representation of the outside world. Direct teaching, feedback, and explanation affect learning. Knowledge is accurate to the extent that it reflects the &quot;way things really are&quot; in the outside world.</td>
<td>Information processing</td>
</tr>
<tr>
<td>Internal Direction</td>
<td>Knowledge is constructed by transforming, organizing, and reorganizing previous knowledge. Knowledge is not a mirror of the external world; even though experience influences thinking and thinking influences knowledge. Exploration and discovery are more important than teaching.</td>
<td>Piaget</td>
</tr>
<tr>
<td>Both External and Internal Direction</td>
<td>Knowledge is constructed based on social interactions and experience. Knowledge reflects the outside world as filtered through and influenced by culture, language, beliefs, interactions with others, direct teaching, and modeling. Guided discovery, teaching, models, and coaching as well as the individual's prior knowledge, beliefs, and thinking affect learning.</td>
<td>Vygotsky</td>
</tr>
</tbody>
</table>

Knowledge: Situated or General?

A second question that cuts across many constructivist perspectives is whether knowledge is internal, general, and transferable or bound to the time and place in which it is constructed. Psychologists who emphasize the social construction of knowledge and situated learning affirm Vygotsky’s notion that learning is inherently social and embedded in a particular cultural setting (Cobb & Bowers, 1999). What is true in one time and place—such as the “fact” before Columbus’s time that the earth was flat—becomes false in another time and place. Particular ideas may be useful within a specific community of practice, such as fifteenth century navigation, but useless outside that community. What counts as new knowledge is determined in part by how well the new idea fits with current accepted practice. Over time, the current practice may be questioned and even overthrown, but until such major shifts occur, current practice will shape what is considered valuable.

**Situated learning** emphasizes that the real world is not like studying in school. It is more like an apprenticeship where novices, with the support of an expert guide and model, take on more and more responsibility until they are able to function independently. For those who take a situated learning view, this explains learning in factories, around the dinner table, in high school halls, in street gangs, in the business office, and on the playground.

Situated learning is often described as “enculturation,” or adopting the norms, behaviors, skills, beliefs, language, and attitudes of a particular community. The community might be mathematicians or gang members or writers or students in your 8th-grade class or soccer players—any group that has particular ways of thinking and doing. Knowledge is seen not as individual cognitive structures but as a creation of the community over time. The practices of the community—the ways of interacting and getting things done, as well as the tools the community has created—constitute the knowledge of that community. Learning means becoming more able to participate in those practices, use the tools, and take on the identity of a member of the community (Derry, 1992; Garrison, 1995; Greeno, Collins, & Resnick, 1996; Rogoff, 1998).

At the most basic level, “situated learning . . . emphasizes the idea that much of what is learned is specific to the situation in which it is learned” (Anderson, Reder, & Simon, 1996, p. 5). Thus, some would argue, learning to do calculations in school may help students do more school calculations, but may not help them balance a checkbook, because the skills can be applied only in the context in which they were learned, namely school (Lave, 1997; Lave & Wenger, 1991). But it also appears that knowledge and skills can be applied across contexts that were not part of the initial learning situation, as when you use your ability to read and calculate to do your in-
come taxes, even though income tax forms were not part of your high school cur-
riculum (Anderson, Reder, & Simon, 1996).

Learning that is situated in school does not have to be doomed or irrelevant
(Bereiter, 1997). As you saw in Chapter 8, a major question in educational psychology
and education in general concerns the transfer of knowledge from one situation to
another. How can you encourage this transfer? Help is on the way in the next section.

Common Elements of Constructivist Perspectives

STOP THINK WRITE
What makes a lesson student-centered? List the characteristics and features that
put the student in the center of learning.

We have looked at some areas of disagreement among the constructivist perspectives,
but what about areas of agreement? Even though there is no single constructivist theory,
many constructivist approaches recommend that educators:

- embed learning in complex, realistic, and relevant learning environments;
- provide for social negotiation and shared responsibility as a part of learning;
- support multiple perspectives and use multiple representations of content;
- nurture self-awareness and an understanding that knowledge is constructed; and

Before we discuss particular teaching approaches, let’s look more closely at these
dimensions of constructivist teaching.

Complex Learning Environments and Authentic Tasks. Constructivists believe
that students should not be given stripped-down, simplified problems and basic skills
drills, but instead should encounter complex learning environments that deal with
“fuzzy,” ill-structured problems. The world beyond school presents few simple problems
or step-by-step directions, so schools should be sure that every student has
experience solving complex problems. Complex problems are not simply difficult ones;
they have many parts. There are multiple, interacting elements in complex problems
and multiple solutions are possible. There is no one right way to reach a conclusion,
and each solution may bring a new set of problems. These complex problems should
be embedded in authentic tasks and activities, the kinds of situations that students
will face as they apply what they are learning to the real world (Needles & Knapp,
1994; Resnick, 1987). Students may need support as they work on these complex
problems, with teachers helping them find resources, keeping track of their progress,
breaking larger problems down into smaller ones, and so on. This aspect of
constructivist approaches is consistent with situated learning in emphasizing learning in
situations where the learning will be applied.

Social Negotiation. Many constructivists share Vygotsky’s belief that higher mental
processes develop through social negotiation and interaction, so collaboration in
learning is valued. The Language Development and Hypermedia Group (1992) sug-
ests that a major goal of teaching is to develop students’ abilities to establish and de-
defend their own positions while respecting the positions of others and working
together to negotiate or co-construct meaning. To accomplish this exchange, students
must talk and listen to each other. It is a challenge for children in cultures that are in-
dividualistic and competitive, such as the United States, to adopt what has been called
an intersubjective attitude—a commitment to build shared meaning by finding
common ground and exchanging interpretations.

Multiple Perspectives and Representations of Content. When students en-
counter only one model, one analogy, one way of understanding complex content,
Constructivist approaches may involve, among other things, authentic or real-life tasks, social negotiation, and shared responsibility as part of learning.

**CONNECT & EXTEND**

**TO PRAXIS™**
**STUDENT-CENTERED LEARNING** (II, A2)

Many of the major initiatives to reform content-area curricula (e.g., science, mathematics) emphasize student-centered/constructivist approaches to learning. Describe the major principles of these approaches and explain how they differ from teacher-centered approaches.

they often oversimplify as they try to apply that one approach to every situation. I saw this happen in my educational psychology class when six students were presenting an example of guided discovery learning. The students' presentation was a near copy of a guided discovery demonstration I had given earlier in the semester, but with some major misconceptions. My students knew only one way to represent discovery learning. Resources for the class should have provided multiple representations of content using different analogies, examples, and metaphors.

Rand Spiro and his colleagues (1991) suggest that "revisiting the same material, at different times, in rearranged contexts, for different purposes, and from different conceptual perspectives is essential for attaining the goals of advanced knowledge acquisition" (p. 28). This idea is consistent with Jerome Bruner's (1966) spiral curriculum, a structure for teaching that introduces the fundamental structure of all subjects—the "big ideas"—early in the school years, then revisits the subjects in more and more complex forms over time.

**Understanding the Knowledge Construction Process.** Constructivist approaches emphasize making students aware of their own role in constructing knowledge (Cunningham, 1992). The assumptions we make, our beliefs, and our experiences shape what each of us comes to "know" about the world. Different assumptions and different experiences lead to different knowledge. If students are aware of the influences that shape their thinking, they will be more able to choose, develop, and defend positions in a self-critical way while respecting the positions of others.

**Student Ownership of Learning.** "While there are several interpretations of what constructivist theory means, most agree that it involves a dramatic change in the focus of teaching, putting the students' own efforts to understand at the center of the educational enterprise" (Prawat, 1992, p. 357). Student ownership does not mean that the teacher abandons responsibility for instruction. Because the design of teaching is a central issue in this book, we will spend the rest of this chapter discussing examples of ownership of learning and student-centered instruction.

**Check Yourself** Describe three kinds of constructivism.

---

In what ways do constructivist views differ about knowledge sources, accuracy, and generality?

What are some common elements in most constructivist views of learning?
Applications of Constructivist and Situated Perspectives on Learning

In this section we will examine three specific teaching approaches that put the student at the center: inquiry and problem-based learning, dialogue and instructional conversations, and cognitive apprenticeships. Cooperative learning, another application of social constructivism, is discussed in Chapter 13 as an approach for teaching tolerance, social skills, and empathy.

Inquiry and Problem-Based Learning

John Dewey described the basic inquiry learning format in 1910. There have been many adaptations of this strategy, but the form usually includes these elements (Lashley, Matczynski, & Rowley, 2002). The teacher presents a puzzling event, question, or problem. The students:

- formulate hypotheses to explain the event or solve the problem,
- collect data to test the hypotheses,
- draw conclusions, and
- reflect on the original problem and the thinking processes needed to solve it.

Examples of Inquiry. In one kind of inquiry, teachers present a problem and students ask yes/no questions to gather data and test hypotheses. This allows the teacher to monitor students' thinking and guide the process. Here is an example:

1. Teacher presents discrepant event (after clarifying ground rules). The teacher blows softly across the top of an 8½" × 11" sheet of paper, and the paper rises. She tells students to figure out why it rises.

2. Students ask questions to gather more information and to isolate relevant variables. Teacher answers only “yes” or “no.” Students ask if temperature is important (no). They ask if the paper is of a special kind (no). They ask if air pressure has anything to do with the paper rising (yes). Questions continue.

3. Students test causal relationships. In this case, they ask if the nature of the air on top causes the paper to rise (yes). They ask if the fast movement of the air results in less pressure on the top (yes). Then they test out the rule with other materials—for example, thin plastic.

4. Students form a generalization (principle): “If the air on the top moves faster than the air on the bottom of a surface, then the air pressure on top is lessened, and the object rises.” Later lessons expand students’ understanding of the principles and physical laws through further experiments.

5. The teacher leads students in a discussion of their thinking processes. What were the important variables? How did you put the causes and effects together? and so on. (Pasch et al., 1991, pp. 188–189)

Shirley Magnusson and Annemarie Palincsar have developed a teachers’ guide for planning, implementing, and assessing different phases of inquiry science units (Palincsar, Magnusson, Marano, Ford, & Brown, 1998). The model, called Guided Inquiry Supporting Multiple Literacies or GisML, is shown in Figure 9.2 on page 330.

The teacher first identifies a curriculum area and some general guiding questions, puzzles, or problems. For example, an elementary teacher chooses communication as the area and asks this general question: “How and why do humans and animals communicate?” Next, several specific focus questions are posed: “How do whales communicate?” “How do gorillas communicate?” The focus questions have to

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INQUIRY LEARNING (II, A2, 3)

Inquiry learning is a student-centered approach to learning that pre-dates many "traditional" forms of instruction. Describe the basic structure of this approach to learning. What are its strengths and limitations? What roles does the teacher have?

Inquiry learning Approach in which the teacher presents a puzzling situation and students solve the problem by gathering data and testing their conclusions.
The straight lines show the sequence of phases in instruction and the curved lines show cycles that might be repeated during instruction.

**Figure 9.2 A Model to Guide Teacher Thinking about Inquiry-Based Science Instruction**

be carefully chosen to guide students toward important understandings. One key idea in understanding animal communication is the relationship among the animal's structures, survival functions, and habitat. Animals have specific structures such as large ears or echo-locators, which function to find food or attract mates or identify predators, and these structures and functions are related to the animals' habitats. Thus, focus questions must ask about animals with different structures for communication, different functional needs for survival, and different habitats. Questions about animals with the same kinds of structures or the same habitats would not be good focus points for inquiry (Magnusson & Palincsar, 1995).

The next phase is to engage students in the inquiry, perhaps by playing different animal sounds, having students make guesses and claims about communication, and asking the students questions about their guesses and claims. Then the students conduct both first-hand and second-hand investigations. First-hand investigations are direct experiences and experiments, for example, measuring the size of bats' eyes and ears in relation to their bodies (using pictures or videos—not real bats!). In second-hand investigations, students consult books, the Internet, interviews with experts, and other resources to find specific information or get new ideas. As part of their investigating, the students begin to identify patterns. The curved line in Figure 9.2 shows that cycles can be repeated. In fact, students might go through several cycles of investigating, identifying patterns, and reporting results before moving on to constructing explanations and making final reports. Another possible cycle is to evaluate explanations before reporting by making and then checking predictions, applying the explanation to new situations.
Inquiry teaching allows students to learn content and process at the same time. In the examples above, students learned about the effects of air pressure, how airplanes fly, animal communication, and habitats. In addition, they learned the inquiry process itself—how to solve problems, evaluate solutions, and think critically.

**Problem-Based Learning.** In problem-based learning, students are confronted with a real problem that has meaning for them. This problem launches their inquiry as they collaborate to find solutions. In true problem-based learning, the problem is real and the students' actions matter. In one example, a teacher capitalized on current affairs to encourage student reading, writing, and social studies problem solving:

Cathie's elementary class learned about the Alaskan oil spill. She brought a newspaper article to class that sequenced in logbook fashion the events of the oil spill in Prince William Sound. To prepare her students to understand the article, she had her students participate in several background-building experiences. First, they used a world map, an encyclopedia, and library books to gather and share relevant information. Next, she simulated an oil spill by coating an object with oil. By then, the class was eager to read the article. (Espe, Worner, & Hotkevich, 1990, p. 45)

After they read and discussed the newspaper article, the teacher asked the class to imagine how the problem might have been prevented. Students had to explain and support their proposed solutions. The next week, the students read another newspaper article about how people in their state were helping with the cleanup efforts in Alaska. The teacher asked if the students wanted to help, and they replied with an enthusiastic "Yes!" The students designed posters and made speeches requesting donations of clean towels to be used to clean the oil-soaked animals in Prince William Sound. The class sent four large bags of towels to Alaska to help in the cleanup. The teacher's and the students' reading, writing, research, and speaking were directed toward solving a real-life problem (Espe, Worner, & Hotkevich, 1990). Other authentic problems that might be the focus for student projects are reducing pollution in local rivers, resolving student conflicts in school, raising money for class projects, or building a playground for young children. The teacher's role in problem-based learning is summarized in Table 9.3 on page 332.

Some problems are not authentic in the sense that they affect the students' lives, but they are engaging. For example, the Cognition and Technology Group at Vanderbilt University (CTGV, 1990, 1993) has developed a videodisc-based learning environment that focuses on mathematics instruction for the 5th and 6th grades. The series, called The Adventures of Jasper Woodbury, presents students with complex situations that require problem finding, subgoal setting, and the application of mathematics, science, history, and literature concepts to solve problems. Even though the situations are complex and lifelike, the problems can be solved using data embedded in the stories presented. Often the adventures have real-life follow-up problems that build on the knowledge developed. For example, after designing a playground for a hypothetical group of children in one Jasper adventure, students can tackle building a real playhouse for a preschool class.

The Vanderbilt group calls its problem-based approach **anchored instruction.** The anchor is the rich, interesting situation. This anchor provides a focus—a reason for setting goals, planning, and using mathematical tools to solve problems. The intended outcome is to develop knowledge that is useful and flexible, not inert. Inert knowledge is information that is memorized but seldom applied (CTVG, 1990; Whitehead, 1929).

---

**Problem-based learning** Methods that provide students with realistic problems that don't necessarily have "right" answers.

**Anchored instruction** A type of problem-based learning that uses a complex interesting situation as an anchor for learning.
### Table 9.3

<table>
<thead>
<tr>
<th>Phase</th>
<th>Teacher Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phase 1</strong></td>
<td>Teacher goes over the objectives of the lesson, describes important logistical</td>
</tr>
<tr>
<td>Orient students to the</td>
<td>requirements, and motivates students to engage in self-selected problem-solving</td>
</tr>
<tr>
<td>problem</td>
<td>activity.</td>
</tr>
<tr>
<td><strong>Phase 2</strong></td>
<td>Teacher helps students define and organize study tasks related to the problem.</td>
</tr>
<tr>
<td>Organize students for study</td>
<td></td>
</tr>
<tr>
<td><strong>Phase 3</strong></td>
<td>Teacher encourages students to gather appropriate information, conduct</td>
</tr>
<tr>
<td>Assist independent and group</td>
<td>experiments, and search for explanations and solutions.</td>
</tr>
<tr>
<td>investigation</td>
<td></td>
</tr>
<tr>
<td><strong>Phase 4</strong></td>
<td>Teacher assists students in planning and preparing appropriate artifacts such</td>
</tr>
<tr>
<td>Develop and present</td>
<td>as reports, videos, and models and helps them share their work with others.</td>
</tr>
<tr>
<td>artifacts and exhibits</td>
<td></td>
</tr>
<tr>
<td><strong>Phase 5</strong></td>
<td>Teacher helps students to reflect on their investigations and the processes they</td>
</tr>
<tr>
<td>Analyze and evaluate the</td>
<td>used.</td>
</tr>
<tr>
<td>problem-solving process</td>
<td></td>
</tr>
</tbody>
</table>

**Source:** From Classroom Instruction and Management (p. 161), by R. I. Arends. Published by McGraw-Hill. Copyright © 1997 by McGraw-Hill. Reprinted with permission of The McGraw-Hill Companies.

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**Research on Inquiry and Problem-Based Learning.** Inquiry methods are similar to discovery learning and share some of the same problems, so inquiry must be carefully planned and organized, especially for less prepared students who may lack the background knowledge and problem-solving skills needed to benefit. Some research has shown that discovery methods are ineffective and even detrimental for lower-ability students (Corno & Snow, 1986; Slavin, Karweit, & Madden, 1989). When Ted Bredderman (1983) analyzed the results of 57 comparisons of activity-based learning and more traditional approaches for teaching science, he concluded that activity-based methods were superior to content-based traditional approaches in terms of students' understanding of the scientific method and creativity, but about the same for learning science content.

In 1993, a similar comparison was made of problem-based instruction in medical school. Students learning through problem-based instruction were better at clinical skills such as problem formation and reasoning, but they were worse in their basic knowledge of science and felt less prepared in science (Albanese & Mitchell, 1993). Some students who are better at self-regulation benefit more from problem-based methods (Evensen, Salisbury-Glennon, & Glenn, 2001). The best approach may be a balance of content-focused and inquiry or problem-based methods (Arends, 2000).

For example, Eva Toth, David Klahr, and Zhe Chen (2000) tested a balanced approach for teaching 4th graders how to use the controlled variable strategy in science to design good experiments. The method had three phases: (1) in small groups, students conducted exploratory experiments to identify variables that made a ball roll farther down a ramp; (2) the teacher led a discussion, explained the controlled variable strategy, and modeled good thinking about experiment design; and (3) the students designed and conducted application experiments to isolate which variables caused the ball to roll farther. The combination of inquiry, discussion, explanation, and modeling was successful in helping the students understand the concepts.

Another constructivist approach that relies heavily on interaction is instructional conversations.
Dialogue and Instructional Conversations

One implication of Vygotsky's theory of cognitive development is that important learning and understanding require interaction and conversation. Students need to grapple with problems in their zone of proximal development, and they need the scaffolding provided by interaction with a teacher or other students. Here is a good definition of scaffolding that emphasizes the knowledge that both teacher and student bring—both are experts on something: "Scaffolding is a powerful conception of teaching and learning in which teachers and students create meaningful connections between teachers' cultural knowledge and the everyday experience and knowledge of the student" (McCaslin & Hickey, 2001, p. 137). Look back at the beach conversation between Ben and his father at the beginning of the previous section. Notice how the father used the abalone sandwich and the necklace—connections to Ben's experience and knowledge—to scaffold Ben's understanding.

Instructional conversations are instructional because they are designed to promote learning, but they are conversations, not lectures or traditional discussions. Here is a segment of conversation from a literature group in a bilingual 3rd-grade classroom (Moll & Whitmore, 1993). The conversation shows how the participants mediate each other's learning through dialogue about the shared experience.

T: Sylvester and the Magic Pebble. What did you think about this story?

Rita: I think they cared a lot for him.

T: What do you mean? You mean his parents?

Rita: Yes.

T: What made you think that when you read the story?

Rita: Because they really worried about him.

T: Who else wants to share something? I'd like to hear everybody's ideas. Then we can decide what we want to talk about. Sarah?

Sarah: I think he got the idea of it when he was little, or maybe one of his friends got lost or something.

T: What do you mean, he got the idea?

Sarah: He got the idea for his parents to think that Sylvester got lost.

T: You're talking about where William Steig might have gotten his ideas.

Sarah: Yes.

T: That maybe something like this happened to him or someone he knew. A lot of times authors get their ideas from real life things, don't they? Jon, what did you think about this story?

Jon: It was like a moral story. It's like you can't wish for everything. But, in a sense, everything happened to him when he was panicking.

T: When did you think he panicked?

Jon: Well, when he saw the lion, he started to panic.

Richard: And he turned himself into a rock.

Jon: Yeah. He said, "I wish I were a rock."

T: Right. And it happened, didn't it?

Richard: It was stupid of him.

T: So maybe he wasn't thinking far enough ahead? What would you have wished instead of a rock? (pp. 24-25)

The conversation continues as the students contribute different levels of interpretation of the story. The teacher notes these interpretations in her summary: "Look at all the different kinds of things you had to say. Rita talked about the characters in the
Even taking up lunch money can be an opportunity for an instructional conversation.

During the first few minutes of the day, Ms. White asked how many children wanted hot lunches that day. Eighteen children raised their hands. Six children were going to eat cold lunches. Ms. White asked, “How many children are going to eat lunch here today?”

By starting with 18 and counting on, several children got to the answer of 24. One child got out counters and counted out a set of 18 and another set of 6. He then counted all of them and said “24.”

Ms. White then asked, “How many more children are eating hot lunch than are eating cold lunch?”

Several children counted back from 18 to 12. The child with the blocks matched 18 blocks with 6 blocks and counted the blocks left over.

Ms. White asked the children who volunteered to tell the rest of the class how they got the answer. Ms. White continued asking for different solutions until no one could think of a new way to solve the problem. (Peterson, Fennema, & Carpenter. 1989, p. 45)

This teacher is creating an environment in which students can make sense of mathematics and use mathematics to make sense of the world.

To accomplish these goals, teaching begins with the student’s current understanding. Teachers can capitalize on the natural use of counting strategies to see how many different ways students can solve a problem. The emphasis is on mathematical thinking, not on math “facts” or on learning the one best (teacher’s) way to solve the problem. The teacher is a guide, helping students construct their own understandings through dialogue (Putnam & Borko, 1997).

Cognitive Apprenticeships

Over the centuries, apprenticeships have proved to be an effective form of education. By working alongside a master and perhaps other apprentices, young people have learned many skills, trades, and crafts. Knowledgeable guides provide models, demonstrations, and corrections, as well as a personal bond that is motivating. The performances required of the learner are real and important and grow more complex as the learner becomes more competent (Collins, Brown, & Holm, 1991; Collins, Brown, & Newman, 1989; Hung, 1999). With guided participation in real tasks comes participatory appropriation—students appropriate the knowledge, skills, and values involved in doing the tasks (Rogoff, 1995, 1998). In addition, both the newcomers to learning and the old-timers contribute to the community of practice by mastering and remastering skills—and sometimes improving these skills in the process (Lave & Wenger, 1991).

Allan Collins and his colleagues (1989) suggest that knowledge and skills learned in school have become too separated from their use in the world beyond school. To correct this imbalance, some educators recommend that schools adopt many of the features of apprenticeships. But rather than learning to sculpt or dance or build a cabinet, apprenticeships in school would focus on cognitive objectives such as read-
Elements of the Instructional Conversation

<table>
<thead>
<tr>
<th>Instruction</th>
<th>Conversation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Thematic focus. Teacher selects a theme on which to focus the discussion and has a general plan for how the theme will unfold, including how to &quot;chunk&quot; the text to permit optimal exploration of the theme.</td>
<td>6. Fewer &quot;known-answer&quot; questions. Much of the discussion centers on questions for which there might be more than one correct answer.</td>
</tr>
<tr>
<td>2. Activation and use of background knowledge. Teacher either &quot;hooks into&quot; or provides students with pertinent background knowledge necessary for understanding a text, weaving the information into the discussion.</td>
<td>7. Responsiveness to student contributions. While having an initial plan and maintaining the focus and coherence of the discussion, teacher is also responsive to students' statements and the opportunities they provide.</td>
</tr>
<tr>
<td>3. Direct teaching. When necessary, teacher provides direct teaching of a skill or concept.</td>
<td>8. Connected discourse. The discussion is characterized by multiple, interactive, connected turns; succeeding utterances build on and extend previous ones.</td>
</tr>
<tr>
<td>4. Promotion of more complex language and expression. Teacher elicits more extended student contributions by using a variety of elicitation techniques: invitation to expand, questions, restatements, and pauses.</td>
<td>9. Challenging, but non-threatening, atmosphere. Teacher creates a challenging atmosphere that is balanced by a positive affective climate. Teacher is more collaborator than evaluator and students are challenged to negotiate and construct the meaning of the text.</td>
</tr>
<tr>
<td>5. Promotion of bases for statements or positions. Teacher promotes students’ use of text, pictures, and reasoning to support an argument or position, by gently probing: “What makes you think that?” or “Show us where it says ___.”</td>
<td>10. General participation, including self-selected turns. Teacher does not hold exclusive right to determine who talks; students are encouraged to volunteer or otherwise influence the selection of speaking turns.</td>
</tr>
</tbody>
</table>


Comprehension, writing, or mathematical problem solving. There are many cognitive apprenticeship models, but most share six features:

- Students observe an expert (usually the teacher) model the performance.
- Students get external support through coaching or tutoring (including hints, feedback, models, and reminders).
- Students receive conceptual scaffolding, which is then gradually faded as the student becomes more competent and proficient.
- Students continually articulate their knowledge—putting into words their understanding of the processes and content being learned.
- Students reflect on their progress, comparing their problem solving to an expert's performance and to their own earlier performances.
- Students are required to explore new ways to apply what they are learning—ways that they have not practiced at the master's side.

As students learn, they are challenged to master more complex concepts and skills and to perform them in many different settings (Roth & Bowen, 1995; Shuell, 1996).

How can teaching provide cognitive apprenticeships? Mentoring in teaching is one example. Another is cross-age grouping. In the Key School, an inner-city public elementary school in Indianapolis, Indiana, students of different ages work side-by-side for part of every day on a "pod" designed to have many of the qualities of an apprenticeship. The pods might focus on a craft or a discipline. Examples include gardening, architecture, and "making money." Many levels of expertise are evident in the students of different ages, so students can move at a comfortable pace, but still have the model of a master available. Community volunteers, including many parents, visit to demonstrate a skill that is related to the pod topic.

Cognitive apprenticeship A relationship in which a less experienced learner acquires knowledge and skills under the guidance of an expert.

Applications of Constructivist and Situated Perspectives on Learning
Another successful example of cognitive apprenticeships, the reciprocal teaching approach for reading comprehension, is discussed in Chapter 12.

**A Cognitive Apprenticeship in Learning Mathematics.** Schoenfeld's (1989, 1994) teaching of mathematical problem solving is another example of the cognitive apprenticeship instructional model. Schoenfeld found that novice problem solvers began ineffective solution paths and continued on these paths even though they were not leading toward a solution. In comparison, expert problem solvers moved toward solutions using various cognitive processes such as planning, implementing, and verifying, altering their behavior based on judgments of the validity of their solution processes. To help students become more expert problem solvers, Schoenfeld asks students three important questions: What are you doing? Why are you doing it? and How will success in what you are doing help you find a solution to the problem? These questions help students control the processes they use and build their metacognitive awareness. Here is an example:

Problem sessions begin when I hand out a list of questions. . . . Often one student has an “inspiration” . . . My task is not to say yes or no, or even to evaluate the suggestion. Rather it is to raise the issue for discussion. . . . Typically a number of students respond [that they haven’t made sense of the problem]. When we have made sense of the problem, the suggestion [X] simply doesn’t make sense. . . . When this happens, I step out of my role as moderator to make the point to the whole class: If you make sure you understand the problem before you jump into a solution, you are less likely to go off on a wild goose chase. (Schoenfeld, 1987, p. 201)

This monitoring of the understanding of a problem and the problem-solving process helps students begin to think and act as mathematicians. Throughout this process, Schoenfeld repeats his three questions (What are you doing? Why? How will this help?). Each of these components is essential in helping students to be aware of and to regulate their behaviors.

**Cognitive Apprenticeships in Thinking**

Many educational psychologists believe that good thinking can and should be developed in school. But clearly, teaching thinking entails much more than the standard classroom practices of answering “thought” questions at the end of the chapter or participating in teacher-led discussions. What else is needed? One approach has been to focus on the development of *thinking skills*, either through *stand-alone programs* that teach skills directly, or through indirect methods that embed development of thinking in the regular curriculum. The advantage of stand-alone thinking skills programs is that students do not need extensive subject matter knowledge to master the skills. Students who have had trouble with the traditional curriculum may achieve success—and perhaps an enhanced sense of self-efficacy—through these programs. The disadvantage is that the general skills often are not used outside the program unless teachers make a concerted effort to show students how to apply the skills in specific subjects, as you can see in the Point/Counterpoint discussion (Mayer & Wittrock, 1996; Prawat, 1991).

**Developing Thinking in Every Class.** Another way to develop students’ thinking is to provide cognitive apprenticeships in analysis, problem solving, and reasoning through the regular lessons of the curriculum. David Perkins and his colleagues (Perkins, Jay, & Tishman,
The question of whether schools should focus on process or content, problem-solving skills or core knowledge, higher-order thinking skills or academic information has been debated for years. Some educators suggest that students must be taught how to think and solve problems, while other educators assert that students cannot learn to “think” in the abstract. They must be thinking about something—some content. Should teachers focus on knowledge or thinking?

**Point**

**Problem solving and higher-order thinking can and should be taught.**

An article in the April 28, 1995, issue of the Chronicle of Higher Education makes this claim:

> Critical thinking is at the heart of effective reading, writing, speaking, and listening. It enables us to link together mastery of content with such diverse goals as self-esteem, self-discipline, multicultural education, cooperative learning, and problem solving. It enables all instructors and administrators to raise the level of their own teaching and thinking. (p. A-71)

How can students learn to think critically? Some educators recommend teaching thinking skills directly with widely used techniques such as the Constructive Thinking Program (Cognitive Research Trust). Other researchers argue that learning computer programming languages such as LOGO will improve students’ minds and teach them how to think logically. For example, Papert (1980) believes that when children learn through discovery how to give instructions to computers in LOGO, “powerful intellectual skills are developed in the process” (p. 60). Finally, because expert readers automatically apply certain metacognitive strategies, many educators and psychologists recommend directly teaching novice or poor readers how to apply these strategies. Michael Pressley’s Good Strategy User model and Palincsar and Brown’s (1984) reciprocal teaching approach are successful examples of direct teaching of metacognitive skills. Research on these approaches generally shows improvements in achievement and comprehension for students of all ages who participate (Pressley, Barkowski, & Schneider, 1987; Rosenshine & Meister, 1994).

1993) propose that teachers do this by creating a culture of thinking in their classrooms. This means that there is a spirit of inquisitiveness and critical thinking, a respect for reasoning and creativity, and an expectation that students will learn and understand. In such a classroom, education is seen as enculturation, a broad and complex process of acquiring knowledge and understanding consistent with Vygotsky’s theory of mediated learning. Just as our home culture taught us lessons about the use of language, the culture of a classroom can teach lessons about thinking by giving us models of good thinking; providing direct instruction in thinking processes;

**Counterpoint**

**Thinking and problem-solving skills do not transfer.**

According to E. D. Hirsch, a vocal critic of critical thinking programs:

> But whether such direct instruction of critical thinking or self-monitoring does in fact improve performance is a subject of debate in the research community. For instance, the research regarding critical thinking is not reassuring. Instruction in critical thinking has been going on in several countries for over a hundred years. Yet researchers found that students from nations as varied as Israel, Germany, Australia, the Philippines, and the United States, including those who have been taught critical thinking continue to fall into logical fallacies. (1996, p. 136)

The CoRT program has been used in over 5,000 classrooms in 10 nations. But Polson and Jeffries (1985) report that “after 10 years of widespread use we have no adequate evidence concerning...the effectiveness of the program” (p. 445). In addition, Mayer and Wittrock (1996) note that field studies of problem solving in real situations show that people often fail to apply the mathematical problem-solving approaches they learn in school to actual problems encountered in the grocery store or home.

Even though educators have been more successful in teaching metacognitive skills, critics still caution that there are times when such teaching hinders rather than helps learning. Robert Siegler (1993) suggests that teaching self-monitoring to low-achieving students can interfere with the students’ development of adaptive strategies. Forcing students to use the strategies of experts may put too much burden on working memory as the students struggle to use an unfamiliar strategy and miss the meaning or content of the lesson. For example, rather than teach students strategies for figuring out words from context, it may be helpful for students to focus on learning more vocabulary words.

What do you think? Vote online at www.ablongman.com/woolfolk

**Stand-alone thinking skills programs** Programs that teach thinking skills directly without need for extensive subject matter knowledge.
and encouraging practice of those thinking processes through interactions with others.

**Critical Thinking.** Critical thinking skills are useful in almost every life situation—even in evaluating the media ads that constantly bombard us. When you see a group of gorgeous people extolling the virtues of a particular brand of orange juice as they frolic in skimpy bathing suits, you must decide if sex appeal is a relevant factor in choosing a fruit drink (remember Pavlovian advertising from Chapter 6). Table 9.5 provides a representative list of critical thinking skills.

No matter what approach you use to develop critical thinking, it is important to follow up with additional practice. One lesson is not enough. For example, if your class examined a particular historical document to determine if it reflected bias or propaganda, you should follow up by analyzing other written historical documents, contemporary advertisements, or news stories. Until thinking skills become overlearned and relatively automatic, they are not likely to be transferred to new situations. Instead, students will use these skills only to complete the lesson in social studies, not to evaluate the claims made by friends, politicians, toy manufacturers, or diet plans.

STOP THINK WRITE

How many different words can you list that describe aspects of thinking? Try to “think” of at least 20.

**The Language of Thinking.** My computer’s thesaurus just found over 100 more words when I highlighted “thinking.” The language of thinking consists of natural language terms that refer to mental processes and mental products—“words like think, believe, guess, conjecture, hypothesis,

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**Table 9.5** Examples of Critical Thinking Skills

<table>
<thead>
<tr>
<th>Defining and Clarifying the Problem</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Identify central issues or problems.</td>
</tr>
<tr>
<td>2. Compare similarities and differences.</td>
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<tr>
<td>3. Determine which information is relevant.</td>
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<tr>
<td>4. Formulate appropriate questions.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Judging Information Related to the Problem</th>
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<tbody>
<tr>
<td>5. Distinguish among fact, opinion, and reasoned judgment.</td>
</tr>
<tr>
<td>6. Check consistency.</td>
</tr>
<tr>
<td>7. Identify unstated assumptions.</td>
</tr>
<tr>
<td>8. Recognize stereotypes and clichés.</td>
</tr>
<tr>
<td>9. Recognize bias, emotional factors, propaganda, and semantic slanting.</td>
</tr>
<tr>
<td>10. Recognize different value systems and ideologies.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Solving Problems/Drawing Conclusions</th>
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<tbody>
<tr>
<td>11. Recognize the adequacy of data.</td>
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<tr>
<td>12. Predict probable consequences.</td>
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</table>

An Integrated Constructivist Program: Fostering Communities of Learners

**Fostering Communities of Learners (FCL)** is a system of interacting activities that results in a self-consciously active and reflective learning environment (Brown & Campione, 1996, p. 292). This is an entire instructional program grounded in constructivist learning theories.

It is tempting to reduce the complex processes and understandings of FCL into a simple set of steps or procedures. But the inventors, Ann Brown and Joseph Campione, themselves caution us that in considering FCL, our emphasis should be on philosophy and principles, not procedures and steps. At the heart of FCL is a three-part process: Students engage in independent and group research on one aspect of the class inquiry topic—for example, animal adaptation and survival. The goal is for the entire class to develop a deep understanding of the topic. Because the material is complex, class mastery requires that students become experts on different aspects of the larger topic and share their expertise. The sharing is motivated by a consequential task—a performance that matters. The task may be a traditional test or it may be a public performance, service project, or competition. Thus, the heart of FCL is research, in order to share information, in order to perform a consequential task (Brown, 1997; Brown & Campione, 1996).

This inquiry cycle may not seem that new, but what sets FCL apart, among other things, is having a variety of research-based ways of accomplishing each phase and paying careful attention to teaching students how benefit intellectually and socially from each step. Research can take many forms, such as reading, studying, research seminars, guided writing, consulting with experts face-to-face or electronically, or peer and cross-age tutoring. In order to do research, students are taught and coached in powerful comprehension-monitoring and comprehension-extending strategies such as summarizing and predicting for younger students, and for older students, forming analogies, giving causal explanations, providing evidence, and making sound arguments and predictions. Students are taught explicitly how to share information by asking for and giving help, majoring (developing special interest and expertise in an area), learning from each others’ exhibitions, participating in cooperative groups, and joining in whole class cross-talk sessions to check the progress of the research groups. Performing consequential tasks includes publishing, designing, creating solutions to real problems, exhibitions, performances, tests, quizzes, and authentic assessments that can hardly be distinguished from ongoing teaching.

Thoughtful reflection and deep disciplinary content surround and support the research, share, perform cycle. FCL teachers create a culture of thinking—self-conscious reflection about important and complex disciplinary units. As Brown and Campione (1996) point out, we “cannot expect students to invest intellectual curiosity and disciplined inquiry on trivia” (p. 306). In FCL classrooms, the teachers’ main
ploy is to "trap students into thinking deeply" about complex content (Brown & Campione, 1996, p. 302).

Working with Families

Not all educational reforms such as FCL are met with approval by families or the community. Many teachers using nontraditional approaches to learning find that they must explain these approaches to students' families. The Family and Community Partnerships Guidelines give ideas for communicating with parents about innovative constructivist teaching and learning.

Check Yourself

Distinguish between inquiry and problem-based learning.

Describe six features that most cognitive apprenticeship approaches share.

What are instructional conversations?

What is meant by thinking as enculturation?

What is critical thinking?

What is FCL?

Family and Community Partnerships

Communicating about Innovations

Be confident and honest.

Examples

1. Write out your rationale for the methods you are using—consider likely objections and craft your responses.
2. Admit mistakes or oversights—explain what you have learned from them.

Treat parents as equal partners.

Examples

1. Listen carefully to parents' objections, take notes, and follow up on requests or suggestions—remember, you both want the best for the child.
2. Give parents the telephone number of an administrator who will answer their questions about a new program or initiative.
3. Invite families to visit your room or assist in the project in some way.

Communicate effectively.

Examples

1. Use plain language and avoid jargon. If you must use a technical term, define it in accessible ways. Use your best teaching skills to educate parents about the new approach.
2. Encourage local newspapers or television stations to do stories about the "great learning" going on in your classroom or school.

3. Create a lending library of articles and references about the new strategies.

Have examples of projects and assignments available for parents when they visit your class.

Examples

1. Encourage parents to try math activities. If they have trouble, show them how your students (and their child) are successful with the activities and highlight the strategies the students have learned.
2. Keep a library of students' favorite activities to demonstrate for parents.

Develop family involvement packages.

Examples

1. Once a month, send families, via their children, descriptions and examples of the math, science, or language to be learned in the upcoming unit. Include activities children can do with their parents.
2. Make the family project count, for example, as a homework grade.

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Enhancing Your Expertise with Technology

Thinking Skills

Consider this situation. Janet's first end-of-the-year evaluation was going well. The English Department supervisor noted her ability to motivate students, her willingness to participate in co-curricular activities, and her use of effective classroom management techniques. Suddenly, his tone changed. Yes, Janet would be rehired for the next school year. However, based on his classroom observations, analysis of her lesson plans, and comments from her mentoring teacher, the supervisor concluded that Janet needed to take steps to create "a stronger climate for higher-level thinking in her classes." The supervisor was not singling out Janet. Other teachers, including veterans, received the same recommendations in their evaluations.

Most of today's college students went to elementary and high school during a period of reform in the major curricular areas (e.g., science, mathematics), and efforts to reform these areas continue to the present. A common theme of these reforms has been an increased emphasis on the development and use of higher-order thinking skills. For some educators, the term primarily refers to inquiry skills, for others it means problem-solving skills, and for some it emphasizes critical thinking skills—so don't assume everyone means the same thing by the term higher-order thinking. But whatever their concept of "higher-order," many educators agree that teachers inadvertently devote too much attention to lower-order thinking skills (i.e., remembering, comprehending, and applying).

The Center for Critical Thinking (http://www.criticalthinking.org) provides a variety of resources to support teachers' efforts in elementary, secondary, and college classrooms to enhance students' higher-order thinking skills. (The site divides elementary and secondary resources from college resources. Whatever your level, be sure to explore each set of resources.) The resources that you will find at this site should reduce your anxieties (and Janet's) about teaching for higher-order thinking. These resources include easily implemented instructional tactics and assessment strategies to promote a culture of thinking in your classroom. Be sure you examine the typical lessons that have been revised and restructured to encourage the students' higher-order thinking skills.

You might find the following sites valuable too as you build your expertise about thinking skills:

- AEA 7 (http://edservices.aea7.k12.ia.us/framework/thinking/)
- NEA Works4Me Tips Library (http://www.nea.org/helpfrom/growing/works4me/teaching/thinking.html)
- NRWEL (http://www.nrwel.org/scpd/sirs/6/cu11.html)
- ERIC Digests (http://www.ed.gov/databases/ERIC_Digests/index/) (Type "thinking skills" in the search box.)

Looking Back at Learning

What Would You Say? As part of your interview for a job in a large district, the superintendent asks, "What is your conception of learning? How do students learn?"

For the past four chapters we have examined different aspects of learning. We considered behavioral, information processing, social cognitive, constructivist, and situated explanations of what people learn and how they learn it. As a summary of the different theories of learning, Table 9.6 on page 342 presents several of these perspectives on learning. Rather than debating the merits of each approach, consider their contributions to understanding learning and improving teaching. Don't feel that you must choose the "best" approach—there is no such thing. Chemists, biologists, and nutritionists rely on different theories to explain and improve health. Different views of learning can be used together to create productive learning environments. Behavioral theory helps us understand the role of cues in setting the stage for behaviors and the role of consequences and practice in encouraging or discouraging behaviors. But much of humans' lives and learning is more than behaviors. Language and higher-order thinking requires complex information processing and memory—something the cognitive models of the thinker-as-computer have helped us understand. And what about the person as a creator and constructor of knowledge, not just a processor of information? Here, constructivist perspectives have much to offer.

Check Yourself What do different views of learning add to our understanding?
<table>
<thead>
<tr>
<th>Table 9.6</th>
<th>Four Views of Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Behavioral</strong></td>
<td><strong>Cognitive</strong></td>
</tr>
<tr>
<td>Skinner</td>
<td>J. Anderson</td>
</tr>
<tr>
<td><strong>Knowledge</strong></td>
<td>Fixed body of knowledge to acquire</td>
</tr>
<tr>
<td></td>
<td>Stimulated from outside</td>
</tr>
<tr>
<td><strong>Learning</strong></td>
<td>Acquisition of facts, skills, concepts</td>
</tr>
<tr>
<td></td>
<td>Occurs through drill, guided practice</td>
</tr>
<tr>
<td><strong>Teaching</strong></td>
<td>Transmission (Telling)</td>
</tr>
<tr>
<td></td>
<td>Guide students toward more “accurate” and complete knowledge</td>
</tr>
<tr>
<td><strong>Role of Teacher</strong></td>
<td>Manager, supervisor</td>
</tr>
<tr>
<td></td>
<td>Correct wrong answers</td>
</tr>
<tr>
<td><strong>Role of Peers</strong></td>
<td>Not usually considered</td>
</tr>
<tr>
<td><strong>Role of Student</strong></td>
<td>Passive reception of information</td>
</tr>
<tr>
<td></td>
<td>Active listener, direction-follower</td>
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<td></td>
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</table>

**Social Processes in Learning**  
*(pp. 314–315)*

What are some of the social factors that influence learning in school? Parents, peers, and teachers influence norms and values about school achievement. Children tend to select friends that share their orientations and interests, and these peer groups, in turn, influence children’s academic motivation. But parents and teachers play a role, too. Students with authoritative parents are more likely to choose positive peer groups and to resist peer pressure for antisocial behaviors such as drug use. If students have few or no friends, being liked by the teacher can be especially important.

**Social Learning and Social Cognitive Theories**  
*(pp. 315–322)*

**Distinguish between social learning and social cognitive theories.** Social learning theory was an early neo-behavioral theory that expanded behavioral views of reinforcement and punishment. In behavioral views, reinforcement and punishment directly affect behavior. In social learning theory, seeing another person, a model, reinforced or punished can have similar effects on the observer’s behavior. Social cognitive theory expands social learning theory to include cognitive factors such as beliefs, expectations, and perceptions of self.

**Distinguish between enactive and vicarious learning.** Enactive learning is learning by doing and experiencing the consequences of your actions. Vicarious learning is learning by observing, which challenges the behaviorist idea that cognitive factors are unnecessary in an explanation of learning. Much is going on mentally before performance and reinforcement can even take place.

**What are the elements of observational learning?** In order to learn through observation, we have to pay attention to aspects of the situation that will help us learn. In order to imitate the behavior of a model, you have to retain the information. This involves mentally representing the model’s actions in some way, probably as verbal steps. In the production phase, practice makes the behavior smoother and more expert. Sometimes we need a great deal of practice, feedback, and coaching about subtle points before we can reproduce the behavior of the model. Finally, motivation shapes observational learning through incentives and reinforcement. We may not perform a learned behavior until there is some motivation or incentive to do so. Reinforcement can focus attention, encourage reproduction or practice, and maintain the new learning.

**What is reciprocal determinism?** Personal factors (beliefs, expectations, attitudes, and knowledge), the physical and social environment (resources, consequences of actions, other people, and physical settings), and behavior (individual actions, choices, and verbal statements) all influence and are influenced by each other.

- **Social Learning Theory:** Theory that emphasizes learning through observation of others.
- **Social Cognitive Theory:** Theory that adds concern with cognitive factors such as beliefs, self-perceptions, and expectations to social learning theory.
- **Observational Learning:** Learning by observation and imitation of others.
- **Vicarious Reinforcement:** Increasing the chances that we will repeat a behavior by observing another person being reinforced for that behavior.
- **Self-Efficacy:** A person’s sense of being able to deal effectively with a particular task.
- **Ripple Effect:** “Consequences” spreading of behaviors through imitation.
- **Modeling:** Changes in behavior, thinking, or emotions that occur through observing another person—a model.
- **Reciprocal Determinism:** An explanation of behavior that emphasizes the mutual effects of the individual and the environment on each other.

**Constructivism and Situated Learning**  
*(pp. 322–328)*

**Describe three kinds of constructivism.** Psychological constructivists such as Piaget are concerned with how individuals make sense of their world, based on individual knowledge, beliefs, self-concept, or identity—also called first wave constructivism. Social constructivists such as Vygotsky believe that social interaction, cultural tools, and activity shape individual development and learning—also called second wave constructivism. By participating in a broad range of activities with others, learners appropriate the outcomes produced by working together; they acquire new strategies and knowledge of their world. Finally, constructivists are interested in how public knowledge in academic disciplines is constructed as well as how everyday beliefs about the world are communicated to new members of a sociocultural group.

**In what ways do constructivist views differ about knowledge sources, accuracy, and generality?** Constructivists debate whether knowledge is constructed by mapping external reality, by adapting and changing internal understandings, or by an interaction of external forces and internal understandings. Most psychologists posit a role for both internal and external factors, but differ in how much they emphasize one or the other. Also, there is discussion about whether knowledge can be constructed in...
one situation and applied to another or whether knowledge is situated, that is, specific and tied to the context in which it was learned.

**What are some common elements in most constructivist views of learning?** Even though there is no single constructivist theory, many constructivist approaches recommend complex, challenging learning environments and authentic tasks; social negotiation and co-construction; multiple representations of content; understanding that knowledge is constructed; and student ownership of learning.

- **Constructivism:** View that emphasizes the active role of the learner in building understanding and making sense of information.
- **First Wave Constructivism:** A focus on the individual and psychological sources of knowing, as in Piaget's theory.
- **Appropriate:** Internalize or take for yourself knowledge and skills developed in interaction with others or with cultural tools.
- **Second Wave Constructivism:** A focus on the social and cultural sources of knowing, as in Vygotsky's theory.
- **Community of Practice:** Social situation or context in which ideas are judged useful or true.
- **Situated Learning:** The idea that skills and knowledge are tied to the situation in which they were learned and difficult to apply in new settings.
- **Complex Learning Environments:** Problems and learning situations that mimic the ill-structured nature of real life.
- **Social Negotiation:** Aspect of learning process that relies on collaboration with others and respect for different perspectives.
- **Intersubjective Attitude:** A commitment to build shared meaning with others by finding common ground and exchanging interpretations.
- **Multiple Representations of Content:** Considering problems using various analogies, examples, and metaphors.
- **Spiral Curriculum:** Bruner's structure for teaching that introduces the fundamental structure of all subjects early in the school years, then revisits the subjects in more and more complex forms over time.

**Applications of Constructivist and Situated Perspectives on Learning**

*(pp. 329-340)*

**Distinguish between inquiry and problem-based learning.** The inquiry strategy begins when the teacher presents a puzzling event, question, or problem. The students then formulate hypotheses to explain the event or solve the problem; collect data to test the hypotheses; draw conclusions; and reflect on the original problem and the thinking processes needed to solve it. Problem-based learning may follow a similar path, but the learning begins with an authentic problem—one that matters to the students. The goal is to learn math or science or history or some other important subject while seeking a real solution to a real problem.

**Describe six features that most cognitive apprenticeship approaches share.** Students observe an expert (usually the teacher) model the performance; get external support through coaching or tutoring; and receive conceptual scaffolding, which is then gradually faded as the student becomes more competent and proficient. Students continually articulate their knowledge—putting into words their understanding of the processes and content being learned. They reflect on their progress, comparing their problem solving to an expert's performance and to their own earlier performances. Finally, students explore new ways to apply what they are learning—ways that they have not practiced at the master's side.

**What are instructional conversations?** Instructional conversations are instructional because they are designed to promote learning, but they are conversations, not lectures or traditional discussions. They are responsive to students' contributions, challenging but not threatening, connected, and interactive—involving all the students. The teacher's goal is to keep everyone cognitively engaged in a substantive discussion.

**What is meant by thinking as enculturation?** Enculturation is a broad and complex process of acquiring knowledge and understanding consistent with Vygotsky's theory of mediated learning. Just as our home culture taught us lessons about the use of language, the culture of a classroom can teach lessons about thinking by giving us models of good thinking; providing direct instruction in thinking processes; and encouraging practice of those thinking processes through interactions with others.

**What is critical thinking?** Critical thinking skills include defining and clarifying the problem, making judgments about the consistency and adequacy of the information related to a problem, and drawing conclusions. No matter what approach you use to develop critical thinking, it is important to follow up activities with additional practice. One lesson is not enough.

**What is FCL?** Fostering Communities of Learners is an approach to organizing classrooms and schools. The heart of FCL is research, in order to share information, in order to perform a consequential task that involves deep disciplinary content. Students engage in independent and group research so the entire class can develop an understanding of the topic. Because the material is complex, class mastery requires that students become experts on different aspects of the larger topic and share their expertise. The sharing is motivated by a consequential task—a performance that matters.

- **Inquiry Learning:** Approach in which the teacher presents a puzzling situation and students solve the problem by gathering data and testing their conclusions.
- **Problem-Based Learning:** Methods that provide students with realistic problems that don't necessarily have "right" answers.
Anchored Instruction: A type of problem-based learning that uses a complex interesting situation as an anchor for learning.

Instructional Conversation: Situation in which students learn through interactions with teachers and/or other students.

Cognitive Apprenticeship: A relationship in which a less experienced learner acquires knowledge and skills under the guidance of an expert.

Stand-Alone Thinking Skills Programs: Programs that teach thinking skills directly without need for extensive subject matter knowledge.

Critical Thinking: Evaluating conclusions by logically and systematically examining the problem, the evidence, and the solution.

Fostering Communities of Learners (FCL): A system of interacting activities that results in a self-consciously active and reflective learning environment and uses a research, share, perform learning cycle.

Looking Back at Learning
(Section pp. 341–342)

What do different views of learning add to our understanding? Rather than debating the merits of each approach, consider their contributions to understanding learning and improving teaching. Different views of learning can be used together to create productive learning environments. Great teachers know and use them all.

Enhancing Your Expertise with Technology: Thinking Skills
(p. 341)

Center for Critical Thinking (http://www.criticalthinking.org)

AEA 7 (http://edservices.aea7.k12.iu.us/framework/thinking/)

NEA Works4Me Tips Library (http://www.nea.org/helpfrom/growing/works4me/teachtac/thinking.html)

NRWEL (http://www.nwrel.org/scpd/sirs/6/cui11.html)
Passing the PRAXIS™

Chapter 9 reflects many of the professional standards created by the Interstate New Teacher Assessment and Support Consortium (INTASC). These standards form the basis of the PRAXIS II™ and state-created teacher licensure exams.

One influential idea from the constructivist perspective on learning is that visiting materials in different contexts for different purposes can enhance the acquisition of knowledge. In a sense, the teacher and students "crisscross" a learning landscape. This chapter's Teachers' Casebook is a landscape especially well suited for several visits. Thoughtful learning activities about such topics as motivation, learning environments, evaluation, and instructional strategies could well be explored through the instructional challenges here.

For a first excursion through this landscape, let's examine student-centered models of instruction, one of the major topics of this chapter. A problem you seem to face in this scenario is a mismatch between the students and the curriculum that exists for them. Most of the students appear unmotivated. Perhaps they see your activities as unconnected to their lives or that they have no responsibility for their own learning. Knowledge of student-centered models of instruction can help you address those concerns and draw your students into active, meaningful learning that is absent in your classroom.

Tips for PRAXIS II™

- Explain the advantages and appropriate uses of major student-centered approaches to learning and instruction:
  - Cooperative learning
  - Inquiry method
  - Problem-based learning
  - Instructional conversations
  - Cognitive apprenticeships

Understand important concepts related to student-centered models of instruction:
- Situated learning
- Critical thinking/Culture of thinking
- Complex learning environments
- Authentic tasks
- Multiple representations of content

Related Topics
- Tapping interests (Chapter 10)
- Objectives for learning (Chapter 12)
- Authentic assessment (Chapters 14 and 15)
- Examples of student-centered teaching in reading, mathematics, and science (Chapter 12)

Standards and Licensure Appendix: PRAXIS II™ and INTASC

Refer to the Appendix at the end of the book for detailed correlations to PRAXIS II™ exam topics and INTASC Standards addressed in this text.

Insights about Job Interviews:
What Would You Say?
1. What is your conception of learning? How do students learn?
2. Who are your models as teachers? Are there teachers from films or books that you would like to be like?

Your Teaching Portfolio: Teaching Resources
- Use Table 9.6, "Four Views of Learning," to think about your own philosophy of learning. Would you incorporate elements from different theoretical approaches into your personal conception of learning?
- Use the Family and Community Partnerships Guidelines to brainstorm ideas for how you would explain your teaching innovations to families. Experiment by drafting a "Newsletter." Add Table 9.4, "Elements of an Instructional Conversation," to your Teaching Resources file.

Video Workshop Extra

If the Video Workshop package was included with your textbook, go to Chapter 9 of the Companion Website (www.ablongman.com/woolkolk) and click on the Video Workshop button. Follow the instructions for viewing Video Clip 10: Classroom Management. Consider this information along with what you've read in Chapter 9 while answering the following questions:
1. Explain the relationship between "active learning" and the constructivist view of learning.
2. Explain the differences among psychological constructivism, social constructivism, and sociological constructivism. Include examples.

Use the CD-ROM included in the back of your textbook to launch the "Becoming a Professional" website. The website features advice on preparing for teacher certification exams, help with getting your first job, and resources to help you perform your job well from the first day forward.
What Would They Do?

Here is how some practicing teachers responded to the teaching situation presented at the beginning of this chapter about the awful "book reviews."

Mark H. Smith
Teacher, Grades Nine–Twelve, Medford High School, Medford, Massachusetts

Experience is the best teacher. In an ideal world you can plan your course with what you think would be great material and be ready with a curriculum to meet the level you expect. But reality sets in when you see the true level of the class. High standards and expectations are great goals but they must be reasonable for the students in your class. The education profession is one that needs constant flexibility and adjustment to situations. Students learn in different ways and teachers who can adapt to classes and curricula have a better chance of succeeding.

Because this class has many different levels it will be important to find some common ground that will interest them as well as get them involved in learning. It will probably be a good idea to do different activities and even let the three top students help teach some of the others. It will not be easy to get everybody on the same page and you will probably have to spend lots of time planning, but with patience and effort you can find the level that fits and get the students to respond.

Thomas W. Newkirk
Eighth Grade Teacher, Hamilton Heights Middle School, Arcadia, Indiana

It would be wonderful from the outset to have a class enthralled with world literature, but you are more likely to have a class frustrated with the prospect of reading another "lame" book. Therefore, it is important to find books with themes relevant to my students. Fortunately, on the reading list there are already some selections related to recent films, and probably there are some selections related to music, television, or even commercials. The more connections I can make between the literature and my students' lives, the more likely I am to motivate them.

Jeff D. Horton
Seventh–Tenth Grade Teacher, Colton School, Colton, Washington

One problem may be the materials that the teacher planned to use. I do believe that students need to be introduced to the "classics" in literature. However, teachers are self-motivated to read and study these writings. We must remember that most students do not feel the same way. The teacher in this scenario must present the "classics" in a way that will hold the students' interest. Instead of reading a whole book, pick out parts that reflect the writing style or message of the author. Then present other parts of the book using other teaching tools. There are movies available that are presented in a more current style that will appeal to students. Whatever the teaching tool used, there must always be a learning activity connected to it.

While three students in the class demonstrate a sophisticated understanding of literature, every student in the class can bring a fresh insight into a discussion and be recognized for his or her contribution. In addition to class discussion, individual and group projects can be designed to encourage students to respond to the material. Considering the diversity of the class, I would evaluate student achievement with grading contracts that challenge students performing at different levels.

Michael J. Ellis
Tenth and Eleventh Grade English Teacher, Quincy High School, Quincy, Massachusetts

It seems the purpose behind the curriculum for this class is to expose the students to a wide array of great literature. That is a noble goal. In teaching, however, nobility must frequently give way to practicality. A teacher's first duty is to guide his students in the acquisition of necessary skills. Sometimes having them read Dickens isn't the best way to do that. The curriculum worked up over the summer will probably work well with the three standouts in the class. I'd try splitting them off from the rest. This can be a logistical nightmare and it effectively doubles your prep time for the class, but it's the best way to be sure that the students of a particular ability level don't stagnate while you cater to another group.

With the rest of the class, it's time to shift on the fly and ditch the original reading list. Emphasizing longer novels in a class dominated by poor readers is nothing less than a suicide attempt spread over 40 weeks. If you rely instead on shorter selections and young adult fiction titles with catchy plot lines, then you've at least given yourself a fighting chance at a class that actually finishes the books. It's also never a bad idea to throw video material into the mix.

Go to the Companion Website (www.ablongman.com/woolfolk) for additional case studies including audio and video cases, and examples of student work.