Using Technology to Support Humanistic Approaches to Instruction

Using technology to support a humanistic approach to teaching may seem like a contradiction in terms. But educational technology is becoming more learner centered in both its design and its use. Learner-centered technology tools can link concepts to everyday experiences, guide students in the problem-solving process, encourage learners to think more deeply, facilitate unique knowledge construction, and provide opportunities for social interaction and dialogue. For example, graphing calculators, hand-held computers, and microcomputer laboratory equipment allow students to depict data collected from a polluted stream or pond. Prompts embedded in a word processing program encourage reflection on one's report about that environmental problem. Finally, computer conferencing on the Web allows these same students to engage in discussions about their findings with same-age peers far beyond their own classroom. A key strength of emerging technology environments is that they place the responsibility for learning in the hands of learners, thereby enabling them to ask personally relevant questions, pursue needed knowledge, and generally be more self-directed.

Social

THE SOCIAL APPROACH TO TEACHING: TEACHING STUDENTS HOW TO LEARN FROM EACH OTHER

Classroom tasks can be structured so that students are forced to compete with one another, to work individually, or to cooperate with one another to obtain the rewards that teachers make available for successfully completing these tasks. Traditionally, competitive arrangements have been assumed to be superior to the other two in increasing motivation and learning. But reviews of the research literature by David Johnson and Roger Johnson (Johnson & Johnson, 1995; Johnson, Johnson, & Smith, 1995) found cooperative arrangements to be far superior in producing these benefits. In this section, we will describe competitive, individual, and cooperative learning arrangements; identify the elements that make up the major approaches to cooperative learning; and examine the effect of cooperative learning on motivation, achievement, and interpersonal relationships. We would also like to point out that cooperative learning methods are fully consistent with social constructivism because they encourage inquiry, perspective sharing, and conflict resolution.

Types of Classroom Reward Structures

Competitive Structures Competitive goal structures are those in which one's grade is determined by how well everyone else in the group performs (a reward structure that is typically referred to as *norm referenced*). The traditional practice of grading on the curve predetermines the percentage of A, B, C, D, and F grades regardless of the actual distribution of test scores. Because only a small percentage of students in any group can achieve the highest rewards and because this accomplishment must come at some other students' expense, competitive goal structures are characterized by *negative interdependence*. Students try to outdo one another, view classmates' failures as an advantage, and come to believe that the winners deserve their rewards because they are inherently better (Johnson & Johnson, 1998; Johnson, Johnson, & Holubec, 1994; Johnson et al., 1995).

pause & reflect

Have you ever experienced a competitive reward structure in school? Were your reactions positive or negative? Why? Would you use it in your own classroom? How and when?

Some researchers have argued that competitive reward structures lead students to focus on ability as the primary basis for motivation. This orientation is reflected in the question, "Am I smart enough to accomplish this task?" When ability is the basis for motivation, competing successfully in the classroom may be seen as relevant to self-esteem (because nobody loves a loser), difficult to accomplish (because only a few can succeed), and uncertain (because success depends on how everyone else does). These perceptions may cause some students to avoid challenging subjects or tasks, give up in the face of difficulty, reward themselves only if they win a competition, and believe that their own successes are due to ability, whereas the successes of others are due to luck (Ames & Ames, 1984; Covington, 2000).

Competitive reward structures may decrease motivation to learn

Individualistic Structures Individualistic goal structures are characterized by students working alone and earning rewards solely on the quality of their own efforts. The success or failure of other students is irrelevant. All that matters is whether the student meets the standards for a particular task (Johnson et al., 1994; Johnson et al., 1995). For example, thirty students working by themselves at computer terminals are functioning in an individual reward structure. According to Carole Ames and Russell Ames (1984), individual structures lead students to focus on task effort as the primary basis for motivation. This orientation is reflected in the statement, "I can do this if I try." Whether a student perceives a task as difficult depends on how successful she has been with that type of task in the past.

Cooperative Structures Cooperative goal structures are characterized by students working together to accomplish shared goals. What is beneficial for the other students in the group is beneficial for the individual and vice versa. Because students in cooperative groups can obtain a desired reward only if the other students in the group also obtain the same reward, cooperative goal structures are characterized by *positive interdependence*. Also, all groups may receive the same rewards, provided they meet the teacher's criteria for mastery. For example, a teacher might present a lesson on map reading, then give each group its own map and a question-answering exercise. Students then work with each other to ensure that all know how to interpret maps. Each student then takes a quiz on map reading. All teams whose average quiz scores meet a preset standard receive special recognition (Johnson & Johnson, 1998; Joyce & Weil, 2004; Slavin, 1995). In the Suggestions for Teaching: Motivating Students to Learn section in Chapter 12, "Motivation," we describe two particular cooperative learning techniques: Student Teams–Achievement Divisions and Jigsaw.

Cooperative structures lead students to focus on effort and cooperation as the primary basis of motivation. This orientation is reflected in the statement, "We can do this if we try hard and work together." In a cooperative atmosphere, students are motivated out of a sense of obligation: one ought to try, contribute, and help satisfy group norms (Ames & Ames, 1984). William Glasser points out that student motivation and performance tend to be highest for such activities as band, drama club, athletics, the school newspaper, and the yearbook, all of which require a team effort (Gough, 1987).

pause & reflect

Have you ever experienced a cooperative reward structure in school? Were your reactions positive or negative? Why? Would you use it in your own classroom? How and when?

Elements of Cooperative Learning

Over the past thirty years, different approaches to cooperative learning have been proposed by different individuals. The three most popular are those of David Johnson and Roger Johnson (Johnson et al., 1994), Robert Slavin (1994, 1995), and Shlomo Sharan and Yael Sharan (Sharan, 1995; Sharan & Sharan, 1999). To give you a general sense of what cooperative learning is like and to avoid limiting you to any one individual's approach, the following discussion is a synthesis of the main features of each approach.

Group Heterogeneity The size of cooperative-learning groups is relatively small and as heterogeneous as circumstances allow. The recommended size is usually four to five students. At the very least, groups should contain both males and females and students of different ability levels. If possible, different ethnic backgrounds and social classes should be represented as well.

Group Goals/Positive Interdependence A specific goal, such as a grade or a certificate of recognition, is identified for the group to attain. Students are told that they will have to support one another because the group goal can be achieved only if each member learns the material being taught (in the case of a task that culminates in an exam) or makes a specific contribution to the group's effort (in the case of a task that culminates in a presentation or a project).

Promotive Interaction This element is made necessary by the existence of positive interdependence. Students are shown how to help one another overcome problems and complete whatever task has been assigned. This may involve episodes of peer tutoring, temporary assistance, exchanges of information and material, challenging of one another's reasoning, feedback, and encouragement to keep one another highly motivated. *Promotive* means simply that students promote each other's success.

Cooperative learning characterized by heterogeneous groups, positive interdependence, promotive interaction, individual accountability

Individual Accountability This feature stipulates that each member of a group has to make a significant contribution to achieving the group's goal. This may be satisfied by requiring the group to achieve a minimal score on a test, by having the group's test score be the sum or average of each student's quiz scores, or by having each member be responsible for a particular part of a project (such as doing the research and writing for a particular part of a history report).

Interpersonal Skills Positive interdependence and promotive interaction are not likely to occur if students do not know how to make the most of their face-to-face interactions. And you can safely assume that the interpersonal skills most students possess are probably not highly developed. As a result, they have to be taught such basic skills as leadership, decision making, trust building, clear communication, and conflict management. The conflict that arises over differences of opinion, for example, can be constructive if it is used as a stimulus to search for more information or to rethink one's conclusions. But it can destroy group cohesion and productivity if it results in students' stubbornly clinging to a position or referring to one another as "stubborn," "dumb," or "nerdy."

Equal Opportunities for Success Because cooperative groups are heterogeneous with respect to ability and their success depends on positive interdependence, promotive interaction, and individual accountability, it is important that steps be taken to ensure that all students have an opportunity to contribute to their team. You can do this by awarding points for degree of improvement over previous test scores, by having students compete against comparable members of other teams in a game- or tournament-like atmosphere, or by giving students learning assignments (such as math problems) that are geared to their current level of skill.

Team Competition This may seem to be an odd entry in a list of cooperative-learning components, especially in the light of the comments we already made about the ineffectiveness of competition as a spur to motivation and learning. But we're not being contradictory. The main problem with competition is that it is rarely used appropriately. When competition occurs between well-matched teams, is done in the absence of a norm-referenced grading system, and is not used too frequently, it can be an effective way to motivate students to cooperate with each other.

Does Cooperative Learning Work?

The short answer to this question is yes. In the vast majority of studies, forms of cooperative learning have been shown to be more effective than noncooperative reward structures in raising the levels of variables that contribute to motivation, in raising achievement, and in producing positive social outcomes.

Effect on Motivation One way in which cooperative learning contributes to high levels of motivation is in the proacademic attitudes that it fosters among group members. Slavin (1995) cites several studies in which students in cooperative-learning groups felt more strongly than did other students that their groupmates wanted them to come to school every day and work hard in class.

Probably because of such features as promotive interaction and equal opportunities for success, cooperative learning has been shown to have a positive effect on motivation-inducing attributions. That is, students in cooperative-learning groups were more likely to attribute success to hard work and ability than to luck (Slavin, 1995).

Although most of the reported effects of cooperative learning have been positive, negative results have occasionally appeared. Eleventh-grade students whose chemistry classes used a form of cooperative learning experienced declines in motivation, whereas students in the whole-class instruction group reported slight increases. The researchers attributed this finding to students being dissatisfied with the pace and amount of learning because of an upcoming high-stakes test (Shachar & Fischer, 2004).

Effect on Achievement Slavin (1995) examined several dozen studies that lasted four or more weeks and used a variety of cooperative-learning methods. Overall, students in cooperative-learning groups scored about one-fourth of a standard deviation higher on achievement tests than did students taught conventionally. This translates to an advantage of ten percentile ranks (60th percentile for the average cooperative-learning student versus 50th percentile for the average conventionally taught student). But the beneficial effect of cooperative learning varied widely as a function of the particular method used. The best performances occurred with two techniques called Student Teams–Achievement Divisions and Teams-Games-Tournaments. (Both are described in Chapter 12 on motivation.) The cooperative-learning features that seem to be most responsible for learning gains are group goals and individual accountability.

David Johnson, Roger Johnson, and Karl Smith (1995) also reviewed much of the cooperative-learning literature but drew a somewhat different conclusion. They found that the test scores of students in the cooperative-learning groups were about two-thirds of a standard deviation higher than the test scores of students in competitive or individualistic situations. This translates to an advantage of twenty-five percentile ranks (75th versus 50th). It's not clear why Slavin's analysis produced a somewhat lower estimate of the size of the advantage produced by cooperative learning. It may be due in part to differences in the studies that each cited; Slavin focused on studies lasting at least four weeks. It may also be due to differences in the cooperative techniques that various researchers used.

A more current analysis of several studies done on students in grades 1–8 (Gillies, 2003) corroborated the findings of Johnson, Johnson, and Smith (1995). Students in cooperative groups who worked on problem-solving activities that required students to use all six cognitive processes represented in Bloom's Taxonomy scored significantly higher on a subsequent achievement test than did comparable peers who also worked in groups but received no training in group interaction.

Effect on Social Interaction An important part of cooperative learning programs is teaching students how to productively interact with one another, including how to ask relevant, leading questions and how to give group members cogent arguments and justifications for the explanations and help they offer. A team of researchers

(Veenman, Denessen, van den Akker, & van der Rijt, 2005) examined whether pairs of students trained to interact in this way would use these skills more frequently to solve math problems than would student pairs not taught these skills. The study produced a somewhat unusual result. Although students who received training made significantly more high-level, or elaborative, responses when asking for and giving help on the math task than did the untrained students, they did so less frequently than they had before the training. The researchers also found that students who had prior experience with cooperative learning, whether or not they received specific, supplementary training in how to productively ask questions and provide assistance to a classmate, scored higher on the math task than students who had no prior exposure to cooperative learning.

Lest someone argue that comparing students in cooperative learning groups with students who compete with one another or who work alone is tantamount to "stacking the deck," these positive social effects have also been observed when students who were put in cooperative groups and taught how to properly interact were compared with students who were placed in groups but received no training in how to productively interact and support one another. The former exhibited more cooperative behavior, provided more unsolicited explanations to peers, and provided more concrete examples and explanations than did the latter (Gillies, 2003).

In sum, students who learn cooperatively tend to be more highly motivated to learn because of the proacademic attitudes of groupmates, appropriate attributions for success and failure, and greater on-task behavior. They also score higher on tests of achievement and problem solving and tend to get along better with classmates of different racial, ethnic, and social class backgrounds. This last outcome should be of particular interest if you expect to teach in an area marked by cultural diversity.

Why Does Cooperative Learning Work?

When researchers attempt to explain the widespread positive effects that are typically found among studies of cooperative learning, they usually cite one or more of the following explanations (Slavin, 1995).

Cooperative learning effects likely due to stimulation of motivation, cognitive development, meaningful learning

Motivational Effect The various features of cooperative learning, particularly positive interdependence, are highly motivating because they encourage such achievement-oriented behaviors as trying hard, attending class regularly, praising the efforts of others, and receiving help from one's groupmates. Learning is seen as an obligation and a valued activity because the group's success is based on it and one's groupmates will reward it.

Cognitive-Developmental Effect According to Lev Vygotsky, collaboration promotes cognitive growth because students model for each other more advanced ways of thinking than any would demonstrate individually. According to Jean Piaget,

VIDEO CASE

Cooperative Learning: High School History Lesson

Watch the video, study the artifacts in the case, and reflect upon the following questions:

1. How does this Video Case illustrate Vygotsky's theory of cognitive growth through collaboration?
2. Do you think the teacher's ad hoc learning groups are as effective as cooperative learning groups that are thoroughly planned in advance? Please explain your answer.

collaboration among peers hastens the decline of egocentrism and allows the development of more advanced ways of understanding and dealing with the world.

Cognitive Elaboration Effect As we saw in the previous discussion of information-processing theory, new information that is elaborated (restructured and related to existing knowledge) is more easily retrieved from memory than is information that is not elaborated. A particularly effective means of elaboration is explaining something to someone else.

Teachers' Use of Cooperative Learning

JOURNAL ENTRY
Using a Social Approach to Instruction

As we have seen, cooperative learning is a topic about which much has been written and much research has been done. But until recently, no one had tried to assess the extent to which teachers actually use it and in what form. To fill that gap in the literature, Laurence Antil, Joseph Jenkins, Susan Wayne, and Patricia Vadasy (1998) interviewed twenty-one teachers from six elementary schools to assess the extent to which they used cooperative learning methods. All of the teachers claimed they were familiar with cooperative learning through preservice learning, student teaching, graduate classes, workshops, or other teachers. Seventeen of the teachers said they used it every day in a typical week. Most reported being attracted to cooperative learning because it enabled them to address both academic and social learning goals within a single approach. But even though teachers say they use cooperative learning, they aren't necessarily using it as it was intended.

Antil et al. argued that for an instructional approach to merit the label *cooperative learning*, it must include at least the conditions of positive interdependence and individual accountability. A more stringent definition would call for the inclusion of promotive interaction, group heterogeneity, and the development of interpersonal skills. Only five of the twenty-one teachers met the two-feature criterion, and only one reported using all five features. For example, instead of creating heterogeneous groups by putting students of different ability levels together, some teachers used random assignment, allowed students to select their teammates, or allowed students who sat near one another to form groups. Similar results were obtained from a study of 216 highly rated elementary and middle school teachers. Their actual use of such critical components as individual accountability, positive interdependence, and development of interpersonal skills was significantly less than what they would have preferred (Lopata, Miller, & Miller, 2003).

Why do teachers follow the spirit but not the letter of the cooperative learning model? Antil et al. offer several possibilities:

- Perhaps teachers find the models too complicated and difficult to put into practice. For example, in Slavin's model, individual accountability involves keeping a running log of students' weekly test scores, computing individual averages and improvement scores, totaling scores for each team based on members' improvement scores, and assigning group rewards.
- Teachers don't really believe the researchers' claims that certain elements of cooperative learning are essential for improved learning, perhaps because their classroom experience has led them to believe otherwise.
- Teachers interpret the research as providing suggestions or guidelines rather than prescriptions that must be followed, leaving them free to construct personal adaptations.
- Researchers rarely explicitly state that the demonstrated benefits of cooperative learning will occur only when certain conditions are met.

Another possibility not mentioned by Antil et al. is based on studies of how teachers implement other instructional tools, such as reciprocal teaching. Sometimes, unexpected and unfavorable classroom conditions force teachers into making alterations and compromises they might not make under more favorable circumstances (Hacker & Tenent, 2002).

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The Thought Questions and Reflective Journal Questions at the textbook's student website can help you think about the issues raised in this chapter.

Do teachers' adaptations of the cooperative learning approaches advocated by researchers lead to inferior outcomes? Unfortunately, that's a question that has no definitive answer at this point, because there is little research on how effective cooperative learning is when some of its defining elements are omitted. But the following study, which looked at the effects of group heterogeneity on problem solving, suggests that you should stay as close as circumstances permit to the original features of cooperative learning.

Noreen Webb, Kariane Nemer, Alexander Chizhik, and Brenda Sugrue (1998) looked at seventh- and eighth-grade students who had been given three weeks of instruction on electricity concepts (such as voltage, resistance, and current) and electric circuits and who were judged as having either low ability, low-medium ability, medium-high ability, or high ability. These students were assigned to either homogeneous or heterogeneous groups and then allowed to work collaboratively to solve a hands-on physics test (create a circuit by using batteries, bulbs, wires, and resistors). Students with low and low-medium ability who worked in heterogeneous groups (that is, groups that included a student with either medium-high or high ability) outscored their peers in homogeneous groups on both the hands-on test and a subsequent paper-and-pencil test that students took individually. The difference was attributed to the active involvement of the students with lower ability in the problem-solving process. In response to the more relevant and accurate comments made by the students with high ability, the students with lower ability made and defended suggestions, asked questions, and paraphrased other students' suggestions.

Students with low and average ability in mixed-ability groups outperform peers in homogeneous groups on problem-solving tests; students with high ability in homogeneous groups score slightly higher than peers in mixed-ability groups

A follow-up analysis of the performance of the top 25 percent of this sample was done to examine the effect of placing the students with highest ability in either homogeneous or heterogeneous groups (Webb, Nemer, & Zuniga, 2002). As in the original study, students were classified as having low, low-medium, medium-high, or high ability on the basis of preexperiment test scores. Students with high ability who worked in homogeneous groups (with just other students with high ability) earned significantly higher scores on the hands-on and paper-and-pencil tests than students with high ability who worked in groups that contained students with either medium-high or low-medium ability. But the performance of students with high ability in homogeneous groups was only slightly lower when they worked in groups that contained students with the lowest ability.

Now that you have read about the behavioral, cognitive, humanistic, and social approaches to instruction, take a few minutes to study Table 11.1. It summarizes the basic emphases of each approach and allows you to compare them for similarities and differences.

Using Technology to Support Social Approaches to Instruction

Social Constructivist Learning Whereas the cognitive constructivist looks to find tools to help the child's mind actively construct relationships and ideas, the social constructivist looks as well for tools that help children negotiate ideas and findings in a community of peers. For instance, some point out that it is not just the quality of a computer simulation or microworld that determines the degree to which students will become more like expert scientists; rather, the social activities and talk between students and teachers in that environment are also central to student learning (Roschelle, 1996). This contention is supported by a large number of studies. An analysis of the results from 122 studies found that students whose computer-based instruction took place in the context of small-group learning outscored students who worked alone at a computer by about six percentile ranks on individual tests of achievement. When the performance of the group as a whole was compared with that of students who worked alone, the difference increased to about twelve percentile ranks. In addition, students who worked on computer-based projects with other students exhibited more self-regulated learning behavior, greater persistence, and more positive attitudes toward group work and

Successful technology applications are embedded in an active social environment

Table 11.1 Behavioral, Cognitive, Humanistic, and Social Approaches to Instruction

Behavioral (direct instruction)	Teacher presents information efficiently. Student accepts all information transmitted by teacher and textbook as accurate and potentially useful. Emphasis is on acquiring information in small units through clear presentations, practice, and corrective feedback and gradually synthesizing the pieces into larger bodies of knowledge.
Cognitive (information processing)	Teacher presents and helps students to process information meaningfully. Student accepts all information transmitted by teacher and textbook as accurate and potentially useful. Emphasis is on understanding relationships among ideas, relationships between ideas and prior knowledge, and on learning how to control one's cognitive processes effectively.
Cognitive (constructivist)	Teacher helps students to construct meaningful and adaptive knowledge structures by requiring them to engage in higher levels of thinking such as classification, analysis, synthesis, and evaluation; providing scaffolded instruction within the zone of proximal development; embedding tasks in realistic contexts; posing problems and tasks that cause uncertainty, doubt, and curiosity; exposing students to multiple points of view; and allowing students the time to formulate a consensus solution to a task or problem.
Humanistic	Teacher creates a classroom environment that addresses students' needs, helps students understand their attitudes toward learning, promotes a positive self-concept in students, and communicates the belief that all students have value and can learn. Goal is to activate the students' inherent desire to learn and grow.
Social	Teacher assigns students to small, heterogeneous groups and teaches them how to accomplish goals by working together. Each student is accountable for making a significant contribution to the achievement of the group goal. Because of its emphasis on peer collaboration, this approach is consistent with a social constructivist view of learning.

classmates as compared with students who worked on computers alone (Lou, Abrami, & d'Apollonia, 2001).

Cooperative and Collaborative Learning Cooperative learning is fairly well structured, with assigned roles, tasks, and procedures to help students learn material covered in a classroom setting; a related concept, **collaborative learning,** allows the students themselves to decide on their roles and use their individual areas of expertise to help investigate problems (Veermans & Cesareni, 2005). As noted throughout this book, with the emergence of the World Wide Web and telecommunications technologies that enable students to publish and share their work internationally, there is no shortage of cooperative and collaborative learning opportunities (Burns, 2002). Networking technologies can be used for many cooperative and collaborative tasks—for example:

- collecting data for group science projects (Riel & Fulton, 2001)
- studying seashore organisms with input from a professional biologist (Veermans & Cesareni, 2005)
- interacting with scientists in the field (Riel & Fulton, 2001)

- describing the origin of and evidence surrounding such myths as the sunken city of Atlantis (Veermans & Cesareni, 2005)
- practicing reading and writing in a foreign language (Greenfield, 2003; LeLoup & Ponterio, 2003)
- giving peer and expert feedback on art, music, and writing assignments (Sherry & Billig, 2002)
- mentoring by adult experts in such subjects as math, science, and writing (Riel & Fulton, 2001)
- communicating with students in other countries (LeLoup & Ponterio, 2003)

VIDEO CASE

Multimedia Literacy: Integrating Technology into the Middle School Curriculum

Watch the video, study the artifacts in the case, and reflect upon the following questions:

1. Does the technology-based lesson in the Video Case promote social constructivist teaching and learning? Why or why not?
2. How does the teacher in the Video Case establish an effective cooperative-learning environment? Cite some specific examples based on your viewing of the case.

HM TeacherPrepSPACE

As you review this chapter, check the ACE practice tests and the PowerPoint slides at the textbook's student website.

As noted in previous chapters, the emergence of computer networking technologies is creating many interesting opportunities for students to enter into virtual communities with peers from other schools and countries and to share and discuss various data and ideas. Students who participate in the GLOBE Program (**www.GLOBE.gov**), for example, collaborate with students from around the world on environmental science projects (Riel & Fulton, 2001). The WEB Project (**www.webproject.org**) allows students to interact with and receive feedback from adult experts about works in progress. Art and music students, for example, get suggestions from artists, multimedia designers, musicians, and composers (Sherry & Billig, 2002). Last, the 4Directions Project (**www.4directions.org**), which we mentioned in Chapter 5 on cultural and socioeconomic diversity, allows American Indian students in ten states to interact with one another and with adult experts. They can, for example, discuss research ideas and career options with American Indian professionals (Allen, Resta, & Christal, 2002).

Who Plans for Whom?

CHALLENGING ASSUMPTIONS

"OK, Don," says Connie. "Let's take another look at how you approached the planning process. Keep in mind that planning is not just something you do before you teach; planning *is* teaching. Even though it happens before you set foot in a classroom, it determines to a large extent what and how your students will learn. In the case of your 'day and night' presentation, your planning focused on you much more than on your students. Let's turn that perspective on its head and ask: What, exactly, do you expect your students to learn from the presentation? More to the point, what happens to your planning if student learning is your starting point?"

Don says, "I see what you mean. First, I have to be clear about what my students need to know and be able to do, and then decide what I can do to help them. What I do is determined by what students need to learn."

Celeste agrees. "Starting with student learning changes the way you look at teaching. And, actually, that's kind of a relief. I have been so worried about what I was going to do in my first classroom. This whole year, I have been so focused on me rather than my kids' learning."

"That's not unusual," says Connie. "Whenever you enter a new environment, it's natural to feel uncertain about how that environment will work and how you will fit into it. Teaching is a new environment for you both. It's only natural for you to ask yourself, 'What am I going to do when I'm all alone in my own classroom?'"

"Yeah, that was a scary thought all right," says Don. "It's still scary, but at least I know where to start. It'll feel a lot better to plan for student learning rather than trying to figure out what kind of 'show' to put on."

Resources for Further Investigation

Instructional Objectives

If you would like to read Robert Mager's complete description of his recommendations for writing specific objectives, peruse his brief paperback *Preparing Instructional Objectives* (3rd ed., 1997). Norman Gronlund explains his approach to using objectives in *Writing Instructional Objectives for Teaching and Assessment* (7th ed., 2004).

To accommodate the growth in understanding of such cognitive processes as metacognition and self-regulated learning, Robert Marzano proposes a new cognitive domain taxonomy that incorporates and adds to the taxonomy created by Benjamin Bloom and his associates in *Designing a New Taxonomy of Educational Objectives* (Marzano, 2001).

Direct Instruction

In *Research on Direct Instruction: 25 Years Beyond DISTAR* (1996), Gary Adams and Siegfried Engelmann cover the origins of Direct Instruction (by capitalizing the term *Direct Instruction*, Adams and Engelmann seek to distinguish the original and highly structured approach that Engelmann devised in 1964 from the more generic approach we described in this chapter), its features, myths about its nature, and a review of research results on its effects. Appendix A in the book provides a list of Direct Instruction programs for reading, language arts, writing, spelling, mathematics, and science.

Introduction to Direct Instruction (2004), by Nancy Marchand-Martella, Timothy Slocum, and Ronald Martella, covers the history and nature of Direct Instruction and its application to various school subjects.

The Cognitive Approach to Instruction

Comprehension Instruction: Perspectives and Suggestions (2002), edited by Cathy Collins Block and Michael Pressley, contains twenty-four chapters that describe research-based approaches to comprehension instruction. You may want to start with Chapters 3 ("The Case for Direct Explanation of Strategies"), 12 ("Teaching Readers How to Comprehend Text Strategically"), 14 ("Preparing Young Learners for Successful Reading Comprehension: Laying the Foundation"), 16 ("Comprehension Instruction in the Primary Grades"), 22 ("Straddling Two Worlds: Self-Directed Comprehension Instruction for Middle Schoolers"), and 23 ("Improving the Reading Comprehension of At-Risk Adolescents").

Scaffolding Student Learning: Instructional Approaches and Issues (1997), edited by Kathleen Hogan and Michael Pressley, contains five chapters that describe and illustrate with actual classroom examples how to use scaffolding for a variety of instructional outcomes.

Implementing problem-based learning in kindergarten through eighth-grade classrooms is described by Ann Lambros in *Problem-Based Learning in K–8 Classrooms: A Teacher's Guide to Implementation* (2002).

The Geometric Supposer program can be purchased from the Center for Educational Technology (CET), a non-profit organization located in Israel, or from Amazon.com. A description of the program can be found on the CET website at **www.cet.ac.il/math-international/software5.htm.** Information about the GenScope program, which you can download for free, can be found at **http://genscope.concord.org.**

The Humanistic Approach to Instruction

William W. Purkey and John M. Novak describe a humanistic approach to teaching called "invitational learning" in *Inviting School Success: A Self-Concept Approach to Teaching, Learning, and Democratic Practice* (1996). Larry Holt and Marcella

Kysilka (2006) describe the essence of humanistic education in Chapter 10 ("Nondirective Learning") of their book *Instructional Patterns*.

• Cooperative Learning

The New Circles of Learning: Cooperation in the Classroom and School (1994), by David W. Johnson, Roger T. Johnson, and Edythe Johnson Holubec, is a brief (105 pages) and readable description of the basic elements of the authors' version of cooperative learning. In *Cooperative Learning: Theory, Research, and Practice* (1995), Robert E. Slavin describes the cooperative learning techniques that he favors, analyzes the research evidence that supports their use, and provides detailed directions on how to use them.

The Teacher's Sourcebook for Cooperative Learning (2002), by George Jacobs, Michael Power, and Loh Wan Inn, provides a wealth of practical suggestions for implementing cooperative learning in the classroom. Part I describes how to implement the various principles of cooperative learning, Part II answers frequently asked questions, and Part III lists print resources and websites devoted to cooperative learning. Another source of practical information is *Cooperative Work Groups: Preparing Students for the Real World* (2003), by Scott Mandel.

Summary

1. Goals are broad, general statements of desired educational outcomes. Because of their general language, they mean different things to different people and cannot be precisely measured.
2. The vagueness of such goals stimulated psychologists to specify educational outcomes as specific, clearly stated objectives and to organize objectives as taxonomies in each of three domains: cognitive, affective, and psychomotor.
3. The taxonomy for the cognitive domain that Bloom and several associates prepared is composed of six levels: knowledge, comprehension, application, analysis, synthesis, and evaluation.
4. The taxonomy for the affective domain that Krathwohl and several associates prepared is composed of five levels: receiving, responding, valuing, organization, and characterization by a value or value complex.
5. The taxonomy for the psychomotor domain that Simpson prepared is composed of seven levels: perception, set, guided response, mechanism, complex or overt response, adaptation, and origination.
6. Most teachers use test questions that measure knowledge-level objectives, largely ignoring higher-level cognitive outcomes.
7. Mager states that well-written objectives should specify what behaviors the learner will exhibit to indicate mastery, the conditions under which the behavior will be exhibited, and the criteria of acceptable performance.
8. Gronlund believes that complex and advanced kinds of learning do not lend themselves to Mager-type objectives. Complex outcomes are so broad in scope that it is impractical to ask students to demonstrate everything they have learned. Instead, Gronlund suggests that teachers first state a general objective and then specify a sample of related specific outcomes.
9. Objectives must be consistent with the instructional approach one uses and the types of tests one creates.
10. Objectives work best when students are aware of them and understand their intent, when they are clearly written, and when they are provided to average students for tasks of average difficulty. Objectives often increase intentional learning but may decrease incidental learning.
11. Direct instruction is an approach derived from behavioral learning theory. Lessons are broken down into small steps, the teacher models the desired behavior, material is presented in a variety of formats, students are given extensive opportunities to practice, and feedback is given consistently.
12. An information-processing approach to teaching is based on knowledge of how information is meaningfully processed and attempts to teach students how to be self-directed learners. Teachers should communicate their goals clearly, use attention-getting devices, present information in organized and meaningful ways, present information in relatively small chunks over realistic time periods, use instructional techniques that facilitate encoding of information in long-term memory, and model effective learning processes.
13. A constructivist approach to teaching is based on the view that meaningful learning occurs when students are encouraged and helped to create the knowledge schemes that produce a broad understanding of ideas and that lead to self-directed learning. Key elements of the constructivist approach include scaffolded instruction within a student's zone of proximal development, learning by discovery, exposure to multiple points of view, use of relevant and realistic problems and tasks, and encouraging students to become self-directed learners.
14. Teachers who opt to use a constructivist approach will likely face conceptual, pedagogical, cultural, and political challenges.
15. A humanistic approach to teaching assumes that all students will be motivated to learn if the classroom environment satisfies their basic needs, strengthens their self-concept, provides assistance in learning new ideas and skills, and allows them to direct their learning experiences.