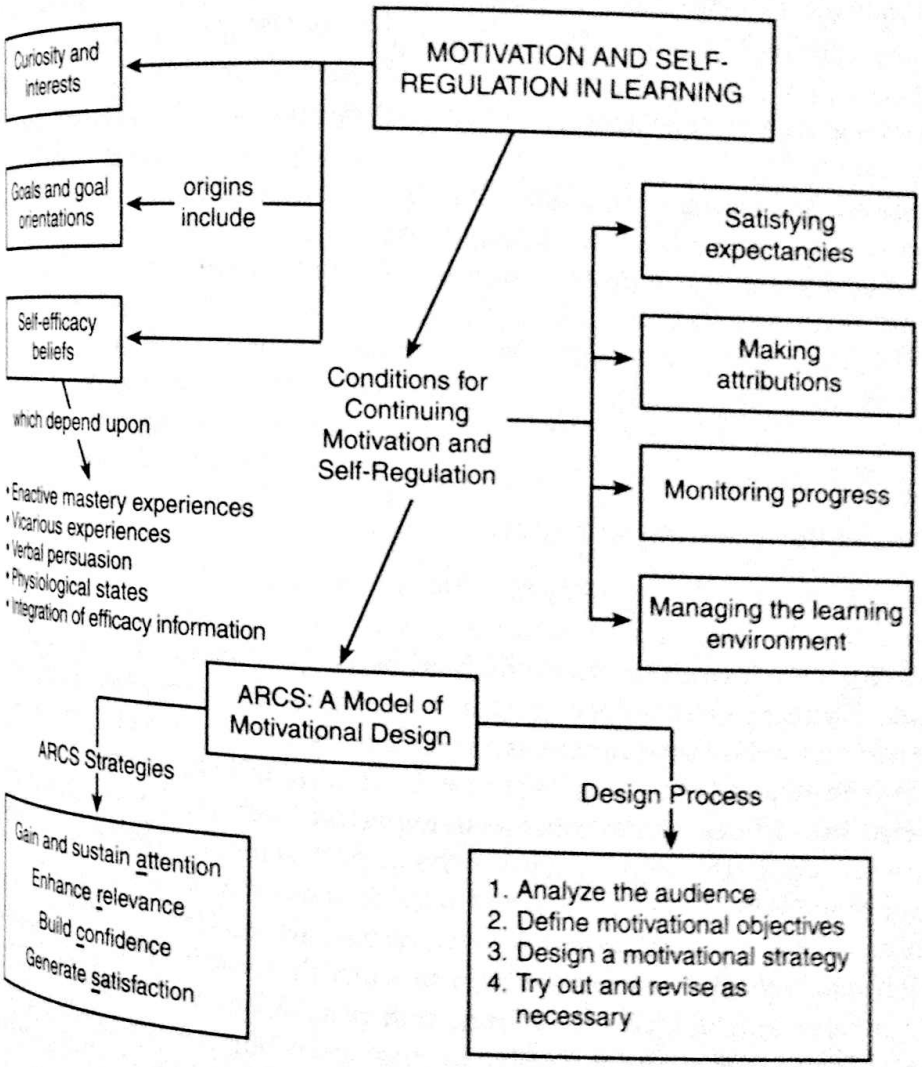
Part VI: Learning and Motivation

9

Motivation and Self-Regulation in Learning



Consider the following scenarios.

• *Workshop Worries*

Sean is a former teacher who has been appointed to the post of field education officer in a developing country because of his record as an outstanding instructor. His assignment is to work with teachers in a particular region of the country to help them improve the quality of instruction in their classrooms. In addition, however, he is expected to conduct research in those same classrooms to help determine the impact of methods and techniques he recommends. Because he does not have the research skills with which to do this part of the job effectively, he attends a 1-week training workshop on action research. Although he wants to learn these skills quickly, he worries that his current lack of knowledge will put him at a disadvantage in the class. Moreover, despite difficulty in understanding the concepts being presented, Sean asks no questions for fear of looking stupid and holding up the rest of the group.

• *Camouflage Training*

Rob is the drill instructor responsible for training soldiers in the art of camouflage. Time after time, he faces men and women whose military assignments (as clerk, radio operator, or band member) seem only remotely related to the need for combat readiness. As a result, the soldiers don't understand why they should have to learn camouflage techniques, and they are convinced they will never be in a position to apply what they are being told to learn. With each group he confronts for the first time, Rob remembers what a hard sell this training is. He has, however, discovered tactics that draw the soldiers in and pique their interest.

Rob begins the first day of class with a challenge. He asks for a volunteer to come to the front of the room where he has put a number of coins on a table. He holds up a quarter and tells the volunteer to stack the coins until the height of the stack is equal to the diameter of the quarter in his hand. By now, every person in the room is paying close attention, and a few are offering words of advice to the volunteer.

"One more!" shouts out a person from the back of the room.

"No, that's too high," offers another.

When the volunteer is satisfied that the stack is the right size, Rob hands over the quarter and says to compare it with the stack of coins on the table. Groans can be heard around the room; the stack is several coins too high. Another volunteer offers to try, so Rob rearranges the coins. Again the volunteer builds a stack with a different combination of coins, and again the stack is too high. At this point, Rob turns to the group and asks what can be learned from this simple demonstration that might be relevant to camouflage.

The second volunteer, still standing near the table, says, "It's a lot easier to fool the eye than I realized."

On the surface, the problems presented in Workshop Worries and Camouflage Training do not seem to have much in common. Sean wants to learn the skills and knowledge being covered in the workshop, but his anxiety about his performance prevents him from seeking the help that will enable him to comprehend and learn from the instruction. The soldiers, on the other hand, are indifferent to the instruction until Rob does something to capture their attention. In both situations, however, some aspect of motivation is at issue.

"Motivation," according to Schunk (1990), "refer[s] to the process whereby goal-directed behavior is instigated and sustained" (p. 3). Motivation is also "a work-related rather than a play-related concept" (Weiner, 1990, p. 621). Teachers say students are not motivated, for example, when they study halfheartedly, complete a task only for the external reward it assures, or spend time on things antithetical to the learning task (e.g., daydreaming about ballet instead of working on fractions). Lack of motivation is also cited when

students plainly refuse to become engaged in a learning task or fail to take actions that will assist them in successfully completing it.

The questions of what underlies motivation and how teachers can effectively motivate their students have been the subject of investigation for many years. Although the theories that have emerged from this research cannot strictly be called learning theories, the study of motivation for educators is certainly confounded with the study of learning. As Weiner (1990) put it, "Motivation is often inferred from learning, and learning usually is an indicator of motivation for the educational psychologist" (p. 618). A central issue, then, is: How do we motivate people to engage in new learning?

Of equal importance for many in today's complex and information-rich society is: How do we help learners develop self-regulatory skills to set their own goals and manage their own learning and performance? Schunk and Zimmerman (1994) considered self-regulation to be the reciprocal of motivation and defined it as "the process whereby students activate and sustain cognitions, behaviors, and affects, which are systematically oriented toward the attainment of their goals" (p. 309; see also Zimmerman, 1989, and Pintrich, 2000).

In this chapter, issues related to motivation and self-regulation are explored. After a brief look at the history of research on these twin constructs, origins and determinants of motivation are presented and discussed in some detail. These are factors influencing whether learners initiate and persist in goal-directed learning tasks. As a consequence of these factors and the learners' engagement (successful or not) in learning tasks, they may or may not demonstrate continuing motivation to learn. Continuing motivation and self-regulation are therefore discussed next. Finally, instructional strategies related to motivation and self-regulation are reviewed with two goals in mind:

1. To design instruction so as to be appealing to the intended learners
2. To design instruction that will facilitate the development of learners' self-regulatory knowledge and skills

A Brief History

"At one time, motivation was the dominant field of study [in psychology]" (Weiner, 1990, p. 616). This was true primarily because psychologists in the 1930s and 1940s conceived of motivation as "what moved a resting organism to a state of activity" (Weiner, 1990, p. 617). You may see already the relationship this concept bears to learning as it was studied in those days. Hull (see Chapter 2), for example, developed a theory of learning in which behavior was presumed to come about as a result of drives toward anticipated goals.

That is, behavior was motivated toward a goal by the existence of some (usually biological) need—e.g., a need for food, sex, or shelter. Learning occurred when the response was reinforced and the drive that motivated the behavior in the first place was reduced.

Tolman's research on latent learning (see Chapter 2), however, had the effect of separating concerns about motivation from concerns about learning (Weiner, 1990). If you recall, Tolman demonstrated that animals appeared to learn a maze simply by exploring it, in the absence of a goal or incentives for drive reduction. Since learning seemed to occur without a clear motivation for it, psychologists began to argue that motivation relates to the use of knowledge, not the development of it.

In the 1960s and 1970s, the shift from a behavioral to cognitive perspective in American psychology (see Chapter 3) brought a reintegration of motivation with learning. Psychologists began to examine in new ways the effects of rewards on behavior. Although it had been widely accepted that rewarding a response automatically increased the probability of its reoccurrence, new findings called this into question. In some cases, rewards had little effect on subsequent behavior unless learners generated an expectancy for, or anticipation of, the reward (Estes, 1972). Moreover, some rewards, if perceived by the learners as controlling, tended to reduce their natural interest in the learning task (Deci, 1975). Similarly, rewards for the completion of an easy task tended to signal to learners that they were low in ability. For humans, then, reward can mean a variety of different things, and each meaning can have different motivational—and learning—consequences.

With researchers now concentrating on human behavior, motivational research became dominated by investigations into humans' need for achievement (Weiner, 1990). Also called incentive motivation, effectance, and the urge for mastery, achievement motivation is thought to be a fundamental tendency of humans to manipulate, dominate, or otherwise master their environment (White, 1959). Among the most prominent researchers in achievement motivation were David McClelland and John Atkinson. They sought to understand why some people appear to strive for excellence simply for the sake of achieving while others do not (McClelland et al., 1953). It was assumed that a high need for achievement developed in children whose parents stressed achievement and competitiveness at home. But achievement motivation can also be situationally affected. Individuals will work harder under certain conditions, such as particular test instructions, competitive environments, and failure (Atkinson, 1964).

Atkinson's work was paralleled by investigations into other individual difference variables related to motivation. For example, besides having high or low achievement motivation, people can have high or low anxiety (Spielberger, 1966), or high or low internal control (Rotter, 1966). Excessive anxiety can interfere with learning and performance, leading to a reduction in

continuing motivation to learn. Conversely, students show greater motivation when they have an internal, as opposed to external, orientation. This means that they tend to perceive learning tasks as skill determined and thus subject to personal control. Externally oriented students tend to believe that their success at a learning task will be determined by chance rather than by means within their control. These students are therefore less likely to be motivated to engage in the learning task.

These trends in motivation research have continued (Weiner, 1990), with an even greater focus on human behavior, particularly the self and learners' attempts to manage their own achievements (Schunk & Zimmerman, 1994; Pintrich, 2000; Zimmerman, 2000). Paris and Paris (2001) noted that over 30 articles have been published on self-regulation since 1990 in a single journal, *Educational Psychologist*. This is in addition to articles published in the same journal that touched on related issues, such as academic studying, motivational influences on education, and social influences on school adjustment (Paris & Paris, 2001, p. 90).

As we shall see in the next section, significant attention is being paid to personal goal setting, ways to enhance self-perceptions of control in learning, and strategies to maintain personal beliefs in high ability. Weiner called for more motivational investigations that are not linked with learning, and indeed, there is a growing body of literature demonstrating effects of motivation on variables such as self-esteem, emotions, and so on (Weiner, 1990). However, for educators, the interaction between motivation and learning is what is most important, so that is the specific focus of this chapter. Therefore, the ensuing discussion is limited to sources and strategies of motivation as they affect and promote learning.

Origins and Determinants of Motivation

Whereas drive theorists clearly demonstrated that physiological needs (e.g., hunger) motivate organisms to engage in certain behavior (e.g., seek food), cognitive theorists have increasingly shown that cognitive processes are important mediators of motivation. Staying with the food example momentarily, when humans seek food to satisfy hunger, not just any food will do. You might, for example, forego a stop at the nearest hamburger joint to go home and fix a nutritious vegetable salad for lunch. Why might you do this? Perhaps because you value a healthy lifestyle, to which low-fat, nutritious meals can contribute. Your values, then, have mediated between the drive (hunger) and your response (eating). Likewise, deciding to engage in a learning task and persisting in that task are no simple matters. As we have already seen, motivation can be influenced by one's need for achievement or locus of control (internal versus external orientation). Motivation is also a function of one's cognitions about the task at hand, about the consequences of task completion, and about one's ability to do the task. Each of these sources of motivation is elaborated further in the sections that follow.

Curiosity and Interest

When Alice entered the Looking Glass, she remarked at how "curiously [the path] twists," always coming back to the house no matter which route she followed away from it. This made her all the more determined to figure out how to reach the nearby hill so that she could continue her adventures (Carroll, 1946, p. 22). Curiosity, in children and adults alike, is a strong motivator of learning. One type of curiosity, perceptual arousal, is initially stimulated by novel, complex, or incongruous patterns in the environment (Berlyne, 1965), much like what Alice encountered in the Looking Glass and Wonderland. Not only do learners pay greater attention to these unexpected events, but they are also moved to try new ways of perceiving what they are looking at (Gagné & Driscoll, 1988). Alice, for example, puzzled over the many curious things that happened to her, sometimes venturing hypotheses about what they meant.

Teachers, too, can make good use of interesting events to stimulate curiosity in learners. Rob's opening demonstration with the coins in Camouflage Training is a good example. To begin with, the soldiers weren't certain what he was about to do with the coins on the table, which activated their attention, and then the result of the demonstration was intriguing. Because people adapt rather quickly to surprising events, curiosity must be sustained for it to be a continuing source of motivation. Rob attempts to do this by having the soldiers make a conscious link between the demonstration and its relevance for what they are about to learn. If the tactic is successful, the students will maintain their interest and pay attention as the instruction continues.

Maintaining attention on a perceptual level can also be achieved by varying the instructional approaches used in a class period or training session (Keller, 1983, 1987a).

Most of you have undoubtedly been bored, at one time or another, by an instructor who did nothing but lecture monotonously and unendingly. To keep learners alert, instructors can employ such strategies as varying their tone of voice, using relevant humor occasionally, and interspersing demonstrations and group activities with lecture.

Another means of sustaining curiosity involves fantasy. "The use of fantasy in learning entails providing learners with a meaningful context for learning that is easy to augment with their imaginations. The context is meaningful to the learner in the sense that it offers a very personal degree of fascination and intrigue" (Rieber, 1991a, p. 320; cf. Malone, 1981). So, for example, learning about longitude and latitude occurs in context and maintains students' attention when a concurrent goal is to locate a "pirate's sunken treasure."

Finally, "a deeper level of curiosity may be activated by creating a problem situation which can be resolved only by knowledge-seeking behavior" (Keller, 1987a, p. 2). Keller (1983) called this inquiry arousal, and it is a factor that researchers in the Cognition and Technology Group at Vanderbilt (CTGV) contend is brought about by the problem complexity inherent in their instructional videos (cf. CTGV, 1990, 1991a, 1991b). They intentionally pose very complex and realistic problems for students to solve, and then provide throughout each video numerous clues and information necessary to solve the problems. The result, they say, is enhanced motivation on the part of learners, who experience the complexity of problems that is characteristic of real life.

Goals and Goal Orientation

Actively setting goals can be an important source of motivation (Bandura, 1977). When individuals set goals, they determine an external standard to which they will internally evaluate their present level of performance. To the extent that this standard is not met and their goals are not yet achieved, learners will persist in their efforts. Undoubtedly, most of us have had the experience of "sticking with it" until a goal we have set for ourselves has been achieved. This was certainly true some years ago when I decided to take up windsurfing. I already knew how to sail and so thought learning to windsurf would be a snap. Instead, it took teeth-gritting patience and persistence over the better part of one summer.

Not all goals, however, will prompt this persistence in learning. Certain properties of goals appear to be important to the goal-setting process (Locke et al., 1981):

- The generality of the goal
- Time it may take to achieve the goal
- The orientation of the goal

Setting specific goals (e.g., "I will be able to connect a circuit to light a lamp") is better than setting general goals (e.g., "I will learn about electricity") for motivating persistent behavior. And as long as the learner is capable of performing the goal, setting more difficult goals tends to lead to greater persistence and better performance than setting easy goals (Locke et al., 1981).

There are also differences between setting proximal versus distal goals (Schunk & Gaa, 1981). Proximal goals are those that are close at hand and achievable quickly (e.g., "I will learn to distinguish between negative reinforcement and punishment"), whereas distal goals are ones that set criteria to be met in the distant future (e.g., "I will learn to be a behavior analyst by the time I graduate from school"). Not surprisingly, results indicate that setting proximal goals improves self-motivation and performance to a greater extent than setting distal goals. This result may be especially important in the teaching of young children, since they may not be capable of representing distal goals in thought (Schunk & Gaa, 1981).

Finally, the types of achievement goals set by learners influence their task persistence and problem-solving efforts (Dweck, 1986; Dweck & Elliot, 1983; Dweck & Leggett, 1988; Elliot & Dweck, 1988; Meece, 1994), as well as their study behaviors and what they remember (Graham & Golan, 1991; Nolen, 1988; Nolen & Haladyna, 1990). When learners set performance goals, they "seek to gain favorable judgments of their competence or avoid negative judgments of their competence" (Dweck, 1986, p. 1040). When they set learning goals, on the other hand, learners "seek to increase their competence, to understand or master something new" (Dweck, 1986, p. 1040). The difference between these two types of goals can be seen in statements such as, "I want to get an A on this test" (performance goal) versus "I want to understand why the United States was one of the last countries to enter World War II" (learning goal).

Faced with a performance goal, students who have little confidence in their abilities display helplessness. They avoid challenge and, given the chance, will quit rather than persist in the task. In the same situation, learners who have high confidence in their abilities will seek a challenge and tend to demonstrate high persistence toward the task. Where learning goals are concerned, on the other hand, students' assessment of their present ability is irrelevant. They all display what Dweck and Leggett (1988) called a "mastery-oriented" pattern of motivation. That is, they select challenging tasks, which are believed to benefit learning, and they demonstrate persistence in those tasks (Elliott & Dweck, 1988; Dweck & Leggett, 1988).

The reason for these differences appears to lie in how individuals interpret their failures within the two goal orientations. Performance goals foster the implicit belief that intelligence is fixed. Under this goal orientation, then, learners ask whether their abilities are adequate to the task, and failing is taken to mean that the answer is "no." By contrast, learning goals are associated with the belief that intelligence is malleable and can be developed. Under a learning goal orientation, strategies for task mastery are emphasized, and learners ask themselves how their abilities might best be applied and increased to achieve the goal. Failure in this case signals a problem with the current strategy and the necessity to revise that strategy. An obvious result is that learners will expend more effort to learn in this situation than when they believe they do not have the ability to achieve the goal (Dweck & Leggett, 1988).

The recommendation to foster a learning goal orientation runs counter to much current educational practice, which attempts to instill learner confidence within a performance goal orientation (Dweck, 1986). Strategies of this sort are, in fact, discussed later in the chapter. It is likely that the behavioral

perspective on learning (specifically, positive reinforcement) contributed to this situation. Recall, for example, the effect of positive reinforcement on learning. How does this relate to motivation? Presumably, behavior that can be described as motivated comes about through its consistent reinforcement. However, "a deeper understanding of the principles of reinforcement would not lead one to expect that frequent praise for short, easy tasks would create a desire for long, challenging ones or promote persistence in the face of failure" (Dweck, 1986, p. 1045).

What conclusions may we draw for instruction from this research on goals? It is apparent that setting challenging, proximal goals contributes to motivation and can lead to enhanced performance. But this is most likely to occur when the goals are oriented toward learning, as opposed to performance.

Self-Efficacy Beliefs

To this point, the roles in motivation of curiosity and students' cognitions about learning tasks have been explored. But another strong source of motivation comes from learners' beliefs about themselves in relation to task difficulty and task outcome. According to Bandura (1997), "Perceived self-efficacy refers to beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (p. 3). Self-efficacy beliefs

> influence the courses of action people choose to pursue, how much effort they put forth in given endeavors, how long they will persevere in the face of obstacles and failures, their resilience to adversity, whether their thought patterns are self-hindering or self-aiding, how much stress and depression they experience in coping with taxing environmental demands, and the level of accomplishments they realize. (Bandura, 1997, p. 3)

Bandura (1977, 1982, 1997) proposed self-efficacy as a belief system that is causally related to behavior and outcomes. That is, people make judgments about their ability to perform certain actions required to achieve a desirable outcome (Figure 9.1). Then, based on their judgments, they proceed or not to engage in those actions. In the Workshop Worries scenario, for example, Sean doubts his ability to learn the research skills being taught in the workshop because he has no prior knowledge of the subject matter. As a consequence, he does not seek the help that could enable him to learn successfully in this situation.

In addition to self-efficacy beliefs, people have expectations about what actions will produce the desirable outcomes. Sean fully expects, for instance, that learning the research skills being taught in the workshop would enable him to perform a job function that he cannot do now. Bandura called these outcome expectations and defined them as the judgments people make

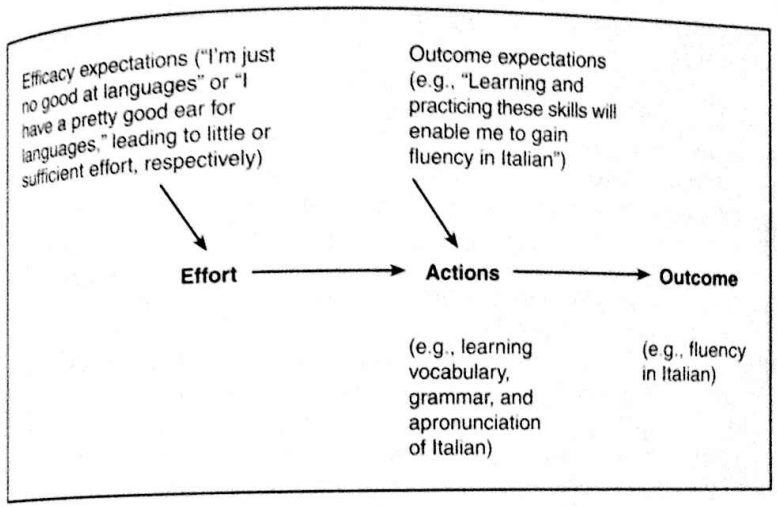


FIGURE 9.1 *Bandura's Theory of Self-Efficacy as a Mediator of Performance and Achievement*

about the consequences of performance. Positive expectations serve as incentives (i.e., Sean was motivated to sign up for the workshop), and negative expectations serve as disincentives (i.e., Sean would have looked elsewhere for training if he thought the workshop was not oriented toward the skills he wants to learn).

Outcome expectations comprise three major types (Bandura, 1986, 1997):

1. Physical effects that accompany an action (e.g., pleasure or pain)
2. Social effects (including approval, social recognition, and monetary compensation on the positive side and disapproval, rejection, and penalties on the negative side)
3. Self-evaluative reactions to one's own behavior

In addition to Sean's outcome expectation that the workshop will lead to desirable research skills, therefore, he may well have outcome expectations that his success in the workshop could lead to a promotion or the commendation of his supervisor.

Performance clearly determines whether outcome expectations are satisfied, and self-efficacy beliefs control performance. People can harbor beliefs about their capabilities (or lack thereof) that bear no relation to their actual ability to perform some task. But making good use of the capabilities

they possess depends upon the self-assurance with which they approach and manage difficult tasks (Bandura, 1997).

Self-efficacy is thought to be a generative capability, not a fixed trait (Bandura, 1997). That is, people develop self-efficacy beliefs in different areas and to different degrees, and these differences help to explain why people with similar skill levels may perform differently or why an individual may perform differently under different circumstances without a change in skill level. Moreover, Bandura (1997) argued that optimistic self-efficacy appraisals benefit the individual whereas realistic appraisals can be self-limiting. If Sean in Workshop Worries, for example, went into the workshop believing he could achieve the goals no matter how little prior knowledge he possessed, his behavior would probably have been quite different. Clearly, though, there is a limit to how much optimism in efficacy beliefs is a good thing. As long as self-beliefs are grounded in past mastery experiences (as opposed to wishful thinking), people will "motivate themselves and construct efficacious courses of action in an anticipatory, proactive way" (Bandura, 1997, p. 77).

How do learners acquire self-efficacy beliefs initially, and how might these beliefs be changed when they prevent learners from undertaking tasks that they have the capability to do? Bandura (1982, 1997) suggested four principal sources by which people gain information to influence their self-efficacy beliefs:

1. Enactive mastery experiences that provide feedback on learners' own capabilities
2. Vicarious experiences that provide comparative information about the attainments of others
3. Verbal persuasion, which provides the learner with information about what others believe he or she is capable of doing
4. Physiological states, internal feelings by which learners judge their ability to engage in the task at hand

Let us consider each of these in turn.

Enactive Mastery Experiences. **Enactive mastery experiences** refer to *a learner's own previous success at a task.* They are the most influential source of self-efficacy beliefs because they provide the most authentic information to learners on their ability to do what it takes to succeed.

An example of how success begets success (and the increased self-beliefs about being successful) can be seen in the following case. Bill was an older student who took a class from me some years ago. I had structured the course so that students had to master a unit quiz before going on to the next unit. They could take each quiz as many as three times in order to achieve an A on it, or they could settle for grades as low as C. One day, early in the semester, Bill took a unit quiz, on which he achieved a B. I asked him, "Bill, do you want to take this quiz over for an A?" He replied, "Oh no, ma'am. I'm not an 'A' kind of guy." Later that day, in proctoring another student's quiz, Bill came back to me and said he thought a mistake might have been made in the scoring of his paper. I checked, and sure enough, one item had been marked wrong that was, in fact, correct. That raised his grade to an A, which I pointed out to him, "You see, Bill, you are an 'A' kind of guy after all." From that day on, Bill nearly always attempted a second try when he achieved less than A on a unit quiz, and on the whole, performed far better than he had ever expected.

According to Bandura (1997), one's interpretation of success or failure on a task, along with perceptions about the difficulty of the task and the amount of effort expended, mediate the effect of enactive experience on self-efficacy beliefs. For example, suppose Sean in Workshop Worries perceives an assignment to be particularly difficult, but he persists and earns praise for his efforts. He is likely to reassess and raise his self-efficacy beliefs as a consequence of this mastery experience. However, suppose Sean views an assignment as something he already knows how to do and so has to exert little effort to be successful. In this case, his self-efficacy beliefs are likely to remain unchanged; he will remain convinced that the workshop is beyond his capabilities and this one assignment is not representative of what he will be asked to do eventually.

Vicarious Experiences. A second source of information that affects self-efficacy beliefs comes from **vicarious experiences,** or *the learner's observation of a role model attaining success at a task.* I frequently witness examples of vicarious experience influencing self-efficacy among the graduate students at my university. Many are convinced that the papers they write, or the research they conduct, will not be good enough for publication or presentation at a conference. This expectation then leads to their failure to complete the work, or their failure to submit it once completed. However, these same students change their self-expectations after attending a conference at which they hear a fellow student present a paper or witness a senior researcher present a boring or flawed paper. Generally, their thoughts run something like, "Gee, I can do at least as well as him (or her)!"

Implied in the story above is the fact that who the role model is affects the extent to which the observer's self-efficacy is enhanced. For example, a graduate student who attends a conference at which he or she is overawed by the presentations is unlikely to modify expectations of not being capable of the same performance. A review of studies on the effects of modeling as a function of the model's attributes revealed a number of conclusions (Schunk, 1987). First, the role model's age appears to have little effect on whether a learner's self-efficacy is enhanced through his or her observation of the model. The one exception to this general statement occurred in a study by

Schunk and Hanson (1985). In their study, elementary school students who had trouble subtracting observed a peer, the teacher, or no model demonstrate regrouping. Observing their peers led to students' reporting greater self-efficacy and achieving greater subtraction skill during the instructional program than observing the teacher, but a teacher model was better than no model.

Second, children are more likely to follow the behavior of those they perceive to be competent in the skill being learned than those they see as less competent. Moreover, when they are fearful about the learning situation, they responded more positively to coping models than mastery models. That is, learners gained confidence and were likely to improve their performance when they observed models who initially showed the same fears but who gradually reached a mastery performance.

Finally, more is better, and peer models can contribute to the self-efficacy of remedial and handicapped students. Presumably, multiple models are superior to one, because chances are greater for the learners to see themselves as similar to at least one of the models. Remedial and handicapped students are among those who have had difficulty learning academic material or coping with stressful situations, both conditions under which peer models can help raise observers' self-efficacy (cf. Bandura, 1986; Schunk, 1987).

Learning from modeled performances involves more than just the learner's perceptions about the model. In his social cognitive theory, Bandura (1986, 1997) proposed four sets of psychological processes that govern what people learn through vicarious experience (Figure 9.2).

The first set of processes refers to what information the learner pays attention to in the modeled events. This depends on attributes of the learner (observer) as well as aspects of the modeled events themselves. Then, the learners constructs a cognitive representation by which to remember the modeled events. The third set of processes enables the learner to transform remembered information into appropriate courses of action. Whether the learner actually performs these actions depends on the fourth set of processes. Learners are more likely to perform modeled events themselves when

- their actions lead to positive consequences,
- they observe benefits experienced by others for similar actions, or
- they find the activities self-satisfying.

Verbal Persuasion. **Verbal persuasion** is a third means by which self-efficacy can be modified, one that is probably most familiar to parents. This refers to *others persuading a learner that he or she is capable of succeeding at a particular task.* "C'mon, you can do it!" is a common exhortation of someone persuading another to attempt a task. This occurred to me when my husband and I decided to restain our cedar home, which stands on stilts approximately

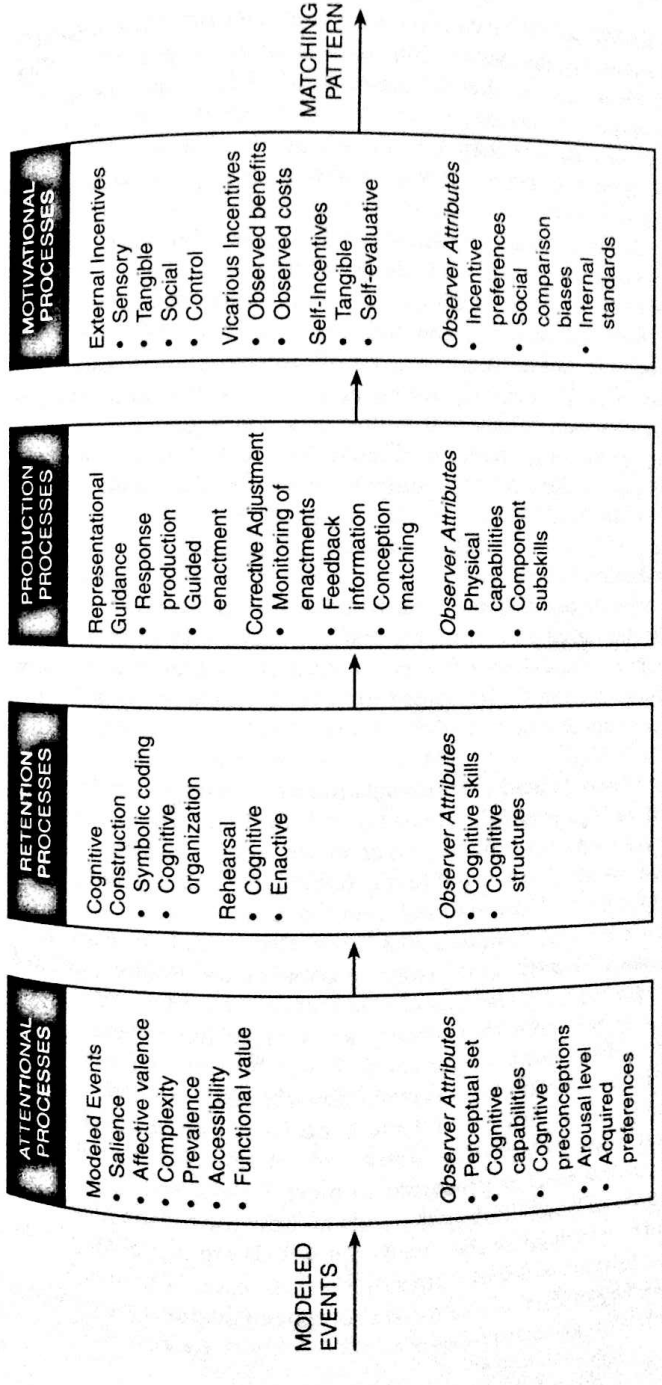


FIGURE 9.2 ***Four Subprocesses Governing Observational Learning***

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20 feet in the air. My self-efficacy for painting from an unstable scaffold that high up was decidedly low, so my husband tried verbal persuasion. "It's easy," he said. "You can do it. Just follow my lead" (vicarious experience). I managed to get to where he was standing before the fourth source of self-efficacy information took over. At that point, out of sheer terror, I froze—unable to look up or down or let go of my tight-fisted grip on the bars of the scaffold.

The way in which persuasory information is framed to learners makes a difference in how it will be perceived and whether it will have a positive effect on self-beliefs. For instance, when teachers praise a student for succeeding at an easy task or make statements such as, "You're making good progress," they may unknowingly reinforce low self-efficacy beliefs. Students who have failed previously are particularly sensitive to this kind of feedback, and their self-beliefs will suffer as a consequence (Graham & Barker, 1990). On the other hand, evaluative feedback that communicates how a learner's work demonstrates competence will produce a higher sense of self-efficacy (Bandura, 1997).

Bandura (1997) also noted that persuasory influences work best when they are only moderately beyond peoples' judgments of their own capabilities. This is probably the reason my husband's exhortations were not effective in persuading me to paint from the scaffold. It wasn't just the height of the scaffold, or its instability, or the narrowness of the platform. All three, plus the painting task itself, contributed to my self-beliefs in my inability to successfully perform this task.

Physiological States. Finally, individuals monitor feelings of self-efficacy on the basis of their **physiological states** (Bandura, 1982). That is, their *"gut feeling" convinces them of probable success or failure.* In my case, my "gut feeling" convinced me that I was about to die! (Obviously, I didn't, but my husband finished the job with me assisting from the ground.)

Identifying internal arousal states is something that Bandura (1986) contended is learned from social labeling coordinated with experienced events. In other words, my identification of fear as the sensation I was feeling in the pit of my stomach probably arose from having experienced events in which that sensation was called "fear" by someone else. Under different circumstances, that same sensation might be labeled "nervous anticipation" and the arousal could have a positive influence on performance. Consider, for example, the arousal felt by an actor waiting in the wings to go on or a teacher preparing to meet a class for the first time. Whether the arousal is debilitating depends on how the person identifies it and the extent to which he or she dwells upon it. There is probably little a teacher can do to alter a student's physiological state, other than to suggest relaxation exercises or desensitization training (see Chapter 2) to overcome fears and anxiety.

Integration of Efficacy Information. With information about self-efficacy coming from so many different sources in so many different ways, an important question is how people integrate all of it to inform their efficacy judgments. Bandura (1997) described the process as complex and indicated that people are generally poor at weighting and integrating multidimensional information. Rather, they tend to pay attention to only some of the information, that which springs more readily to mind or appears most salient. Bandura argued further that "the development of self-appraisal skills...relies on growth of self-reflective metacognitive skills to evaluate the adequacy of one's self-assessments" (1997, p. 115). As we will see later in the chapter, these self-reflective metacognitive skills are also critical to the development of self-regulated behavior as learning proceeds.

Summary

In this section, factors have been considered that influence whether learners will initiate and persist in learning tasks. These have to do with individuals' motivation to learn before the learning has actually begun, and while it is taking place. Most theories of motivation that attempt to account for and explain these factors are classified as expectancy-value theories. As we have seen, for motivation to occur, certain expectancies—about one's abilities, about the task, and about the value of task achievement—must be satisfied.

In the next section, factors are examined that contribute to the overall context of motivation and to continuing motivation. At the end of a learning episode, for example, learners may decide not to continue in further study. This is often caused by expectations that are not met in the original learning situation.

Continuing Motivation

What happens as a result of past learning determines to a large degree whether students will engage in new learning at some time in the future. At least two factors are important to consider in understanding the continuing motivation to learn:

1. Whether learners' expectations about learning and its consequences are being met
2. What attributions learners are making about their failures and successes in learning

Satisfying Expectancies

Imagine that you have just accomplished a challenging goal that you set for yourself. It was a struggle at times, but you remained confident that you

would eventually succeed, and so you persisted (this describes me and my windsurfing experience). Now that you have done it, how do you feel? For me, there was an immediate sense of euphoria (I guess I had entertained some doubts that I would not succeed), followed by a feeling of satisfaction and the thought, "I knew I could do it!"

Chances are your reactions were not unlike mine. When learners succeed at a task, two expectations have typically been met. There is the satisfaction of the outcome expectation. That is, I expected that the outcome of my efforts to learn windsurfing would be mastery of the skills involved. Or, similarly, a student may have expected her efforts to result in a course grade of A; when that occurs, her expectation is satisfied.

There is also, however, the satisfaction of efficacy expectations. Recall that a source of information about self-efficacy is one's previous success at the task. Thus, once success is attained, self-efficacy is increased. Having succeeded once in sailing the windsurfer from one end of the bay to the other without falling down, I am more confident in being successful a second time. Moreover, my self-efficacy for learning, in general, has also been increased.

One of the most rewarding (and subsequently, motivating) results of learning is to use the newly acquired skills or knowledge. Keller (1983, 1987a) referred to this as the natural consequences of learning. Natural consequences occur most often when students see the relevance in what they are learning and have the opportunity to apply newly acquired information. Natural consequences are likely, for example, in the Workshop Worries scenario, in which Sean is learning skills that are immediately useful to him in his job. Natural consequences may be a little harder to identify at first for Rob's students in the Camouflage Training scenario. They do not see the benefits initially of learning camouflage skills, but Rob's hope is to engage their interest long enough that participation in some of the activities he has planned will demonstrate the relevance of the skills.

In the event that new knowledge cannot be made useful immediately, outcome expectations may still be satisfied through positive consequences of completing the task (Keller, 1983, 1987a; Bandura, 1997).

Despite Dweck's concern that extrinsic reinforcement may fail to influence (or may even undermine [Deci, 1975]) intrinsic motivation, there are situations when it is appropriate. It might be useful first, however, to consider when extrinsic rewards are not appropriate for stimulating motivation.

Providing rewards only for participation in an activity has generally led to decreased interest in that activity (Bates, 1979). This is especially true when the activity is itself entertaining or stimulating. So, for example, it would probably be unwise to reward learners for engaging in some task that already interests them. Bates (1979) also concluded that providing rewards may adversely affect motivation when the rewards are not normally regarded as intrinsic to task performance. For example, earning extra wages for more work is salient to tasks performed on an assembly line and therefore might contribute to enhanced motivation. But earning tokens for completed school tasks is not especially intrinsic to performance and may have an effect opposite to that intended. Consider how this relates to the token systems discussed in Chapter 2.

Positive consequences can be especially useful, on the other hand, when learning tasks are inherently boring or their relevance is not perceived by the learner. Learning to spell might be a good example of this case. Many students find spelling assignments to be sheer drudgery; moreover, they often fail to understand why they should learn to spell in the first place. After all, isn't that what spell checkers in word-processing programs are for? In this case, students may find no particular satisfaction in spelling words correctly, but may be satisfied by the attainment of some reward attached to spelling achievement. A fifth grade teacher of my acquaintance gives surprise prizes to students when they achieve certain spelling goals. Although this practice might not interest them in spelling over the long term, it does keep them on task with their spelling assignments by temporarily raising their interest in the subject (cf. Calder & Staw, 1975).

Keller (1987a) also pointed out that "even when people are intrinsically motivated to learn the material, there are likely to be benefits from extrinsic forms of recognition. For example, public acknowledgment of achievement, privileges, student presentations of products, and enthusiastically positive comments are welcome" (p. 6). This is consistent with Bandura's (1997) notion of social effects.

In summary, continuing motivation to learn is facilitated through the satisfaction of expectancies in the current learning episode. When learners succeed at a learning goal, their self-efficacy increases and they experience the natural consequences of learning success. Where natural consequences are less likely to occur, positive consequences can serve in some situations to satisfy an outcome expectation.

Making Attributions

Consider, for a moment, what you think when turning in a test paper on which you know you performed poorly. Do you think, "I didn't study the right things," or "I'm just not feeling up to par today," or "I'm not a good student anyway," or "It's my roommate's fault; he (she) kept me out late so I couldn't study." All of these statements reflect ways in which learners attempt to understand their own performances. Whereas those above pertained to an experience of failure, learners make similar judgments about their successes. For example, "I studied really hard"; "Today is just my lucky day"; "The teacher likes me"; "I'm generally a good student"; "That was an easy test." These attributions about learning and performance constitute an important influence on continuing motivation to learn (Weiner, 1979).

TABLE 9.1 *Examples of Attribution and the Dimensions They Comprise*

Attribution Statement	*Dimensions*
"I didn't study the right things."	Internal, unstable, controllable
"I forced myself to slow down and think."	Internal, unstable, controllable
"I'm just not feeling up to par today."	Internal unstable, uncontrollable
"I studied really hard."	Internal, stable, controllable
"I'm generally a good student."	Internal, stable, uncontrollable
"I'm not a good student anyway."	Internal, stable, uncontrollable
"My kids' schedule frees me to study at the same time each day."	External, stable, controllable
"Her tests are easy."	External, stable, uncontrollable
"The teacher likes me."	External, stable, uncontrollable
"That course is hard."	External, stable, uncontrollable
"It's my roommate's fault; he (she) kept me out late so I couldn't study."	External, unstable, uncontrollable
"Today is just my lucky day."	External, unstable, uncontrollable
"That was an easy test."	External, unstable, uncontrollable

"The central assumption of attribution theory...is that the search for understanding is the (or a) basic 'spring of action'" (Weiner, 1979, p. 3). In other words, people attempt to understand the causes for their successes and failures, and their attributions about these causes determine their future actions. Weiner (1985, 1986, 1992) postulated three dimensions within which most causal attributions can be categorized. These are: internal versus external, stable versus unstable, and controllable versus uncontrollable.

Internal causes of success or failure are those factors within the person, such as ability, effort, and mood. External causes are those outside the learner, such as task difficulty, the attitude of the teacher, help from other people, and so on. The stability dimension refers to how changeable a factor is over time. Ability tends to be stable, whereas mood or luck is unstable. Finally, controllability refers to the degree to which the individual has control over the causes of success or failure. You alone determine how much time you spend studying for a test, since you can set aside sufficient time and then refuse to be distracted from your appointed task. Whether you suddenly contract a stomach virus on the day of the test is beyond your control. See Table 9.1 for examples of attribution statements categorized by dimension.

It should be obvious from the examples that most factors fit along a continuum in each of the three dimensions. Ability, for instance, is internal, relatively stable, and controllable only over the long term (high achievement in a subject leads to potential for further achievement in the same subject). Help from another student, on the other hand, is external, unstable, and uncontrollable by the student experiencing learning difficulties. According to Weiner (1979, 1985, 1986, 1992), each of these dimensions presents implications for continuing motivation.

Consider the factor of ability, for example. Students tend to perceive this internal factor as uncontrollable. Those who attribute their failure to low ability, then, come to believe that "there is no response in [their] repertoire to alter the course of failure" (Graham & Barker, 1990, p. 7). As a result, a vicious cycle is instigated. Students believe they have failed because they are stupid. Since they are stupid, there is no point in trying hard or studying smarter the next time. Because they are not motivated to apply themselves on the next task, they fail again. And so it goes.

If, on the other hand, students attribute their failures to unstable or controllable causes, they are more likely to believe that they will succeed in the future. Doing poorly this time because of illness or not studying means that doing well next time is still possible. Motivation to succeed next time is likely to be enhanced when students perceive that they have the means within their control to assure goal achievement. Weiner argued, therefore, that instructors should use teaching strategies that help learners to see how learning is a function of their own efforts and effective learning strategies and not a function of low ability. This is consistent with Bandura's suggestions regarding the framing of persuasory information.

For most students, failing once is not much cause for concern. Failing repeatedly, however, causes even the most stalwart student to question his or her ability (e.g., Kelley & Michela, 1980). Moreover, indirect cues prompt failure-prone learners to ascribe their failure to low ability. Graham and Barker (1990) investigated the possibility that the offering of help might be perceived as a low-ability cue. They based their investigation on the observation that help is more likely to be offered when the need for help is perceived to be caused by uncontrollable factors. The following example is illustrative. Joan wants to borrow Mary's class notes to see what she missed when she had to leave school to go to a doctor's appointment (an uncontrollable factor). Tony wants to borrow Mary's notes, too, but he missed class because he skipped school to go to the beach (a controllable factor). Which student, Tony or Joan, would you be more likely to lend your notes to?

When help is offered by the teacher or a peer to less able students, these students are likely to infer from the offer of help that they have low ability. In testing this hypothesis, Graham and Barker (1990) demonstrated that "the targets of unsolicited help are perceived by children as less able students who are less likely than their nonhelped peers to do well in the future and to be desirable work mates" (p. 13). They concluded that some well-intentioned instructional practices (e.g., giving help) can have unexpected negative consequences for perceptions of ability.

What can we conclude, then, regarding the effect of attributions on continuing motivation? For one thing, helping learners to attribute their successes and failures to effort and effective (or ineffective) learning strategies is a procedure likely to facilitate motivation. For learners with a history of failures, however, teachers should be especially alert to cues that might further erode individuals' opinions of their abilities.

Self-Regulation

Learners who self-regulate "set goals for their learning and then attempt to monitor, regulate, and control their cognition, motivation, and behavior, guided and constrained by their goals and the contextual features of the environment" (Pintrich, 2000, p. 453). In other words, they try to manage all aspects of motivation that have been discussed so far in the chapter. Zimmerman (1994) proposed a conceptual framework for understanding academic self-regulation, shown in Table 9.2. In addition to self-goals, self-efficacy, and attributions, self-regulation also involves the use of specific strategies to control learning, monitor progress, and structure the environment in ways to support learning.

Processes of Self-Regulation

Zimmerman (2000) also suggested a three-phase cycle to describe the processes of self-regulation during learning (see Figure 9.3). According to this cycle, learners who are effective self-regulators engage first in forethought, or planning. They have "the declarative knowledge to know about specific learning strategies, the procedural knowledge to know how to implement these strategies, and the conditional/metacognitive knowledge to know the conditions and contexts when these strategies should be used" (Lapan, 2002, p. 258). With this, they combine positive self-efficacy beliefs to feel confident that they can successfully complete the learning task. So, for example, it is likely that Bill, the student in my class who became an "A" kind of guy, began to plan his schedule and study strategies after deciding to work for a higher grade on the class quizzes.

The second phase of the cycle involves volitional control over performance, wherein self-regulated learners employ a variety of strategies to manage their own learning and the environmental conditions surrounding them. They also monitor their progress toward goal attainment, making evaluative judgments about their performance, about their self-efficacy for reaching the goal, and about their personal goals in light of their achievement efforts (Bandura, 1997; see also Zimmerman & Schunk, 1989).

For example, suppose a student judges progress as satisfactory. This evaluation would probably raise the student's self-efficacy for achieving the goal and lead to continuation of whatever approach has been taken to the

TABLE 9.2 *Conceptual Analyses of the Dimensions of Academic Self-Regulation*

Scientific Questions	*Psychological Dimensions*	*Task Conditions*	*Self-Regulatory Attributes*	*Self-Regulatory Processes*
Why?	Motive	Choose to participate	Intrinsically or self-motivated	Self-goals, self-efficacy, values, attributions, etc.
How?	Method	Choose method	Planned or automatized	Strategy use, relaxation, etc.
What?	Performance outcomes	Choose performance outcomes	Self-aware of performance outcomes	Self-monitoring, self-judgment, action control, volition, etc.
Where?	Environmental (social)	Control social and physical setting	Environmentally/socially sensitive and resourceful	Environmental structuring, help seeking, etc.

Source: From B. Zimmerman, "Dimensions of Academic Self-Regulation: A Conceptual Framework for Education." In D. H. Schunk & B. J. Zimmerman (Eds.), *Self-Regulation of Learning and Performance.* Hillsdale, NJ: Lawrence Erlbaum Associates, 1994. Reprinted by permission.

task. On the other hand, if progress is deemed unsatisfactory, then two outcomes are possible. With a resilient sense of self-efficacy, the student would seek other means to achieve the goal based on the likely assumption that whatever he or she is doing now has caused the performance deficit. Alternatively, unsatisfactory progress could have a negative effect on self-efficacy, in which instance the student may change his or her own personal goals with respect to the task. Instead of striving for mastery, the student may be satisfied with something less in the belief that mastery cannot be attained.

According to Schunk and Zimmerman (1994), monitoring progress toward goal attainment is a critical component of self-regulation. It sets up what they refer to as an enactive feedback loop (Zimmerman & Schunk, 1989), composed of three strategies:

1. Observing one's performance
2. Comparing one's performance to a standard or goal
3. Reacting and responding to the perceived difference

However, Bandura (1997) views this as only one part of the self-regulatory system, the part that he refers to as discrepancy reduction. That is, people are

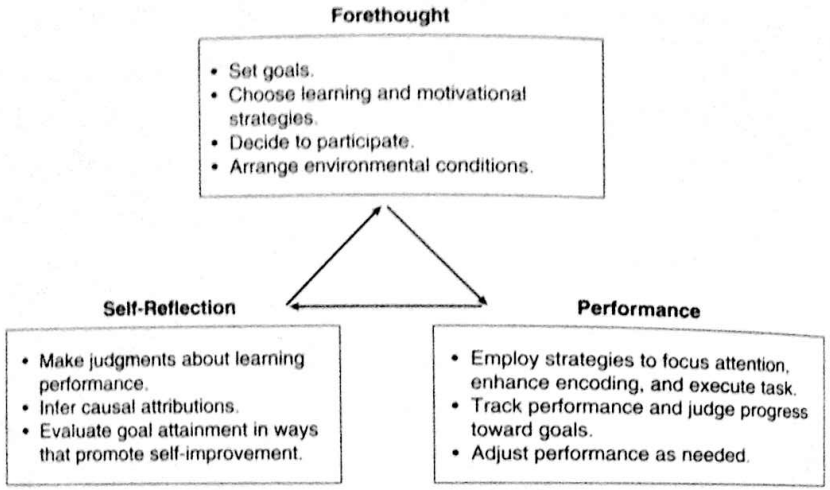

FIGURE 9.3 *Three-Phase Cycle of Self-Regulation*

motivated to reduce the discrepancy they observe between their own performance (step 1) and that provided by the standard or goal (step 2). They take action (step 3) by revising their self-beliefs, changing their goals, or changing their learning tactics.

Discrepancy production, according to Bandura, is the proactive complement to the reactive discrepancy reduction component in the self-regulation system. By discrepancy production, Bandura means that learners set initial goals that they value, thus creating a state of disequilibrium. In turn, they mobilize effort in anticipation of what it will take to attain the goals and continually adjust those efforts until the desired end has been achieved. Often, once that standard has been reached, learners will set even greater challenges, thus creating new motivating discrepancies to be mastered (Bandura, 1997, p. 131).

Finally, at the end of a learning episode after performance has occurred comes the third phase of self-regulation: self-reflection. At this point, self-regulated learners evaluate their performance with an eye toward making improvements for the future. Was their performance what they expected? If not, why not? Perhaps more effective learning strategies could have been selected, or more effort could have been applied to the learning task. Self-regulated learners are likely to make causal attributions that pertain to things they can control rather than to variables such as ability or luck. They are therefore more inclined to make adaptive changes that enhance future performance (Lapan, 2002).

Developing Self-Regulation Skills

How do learners become self-regulated? According to Paris and Paris (2001), there are at least two metaphors guiding research and practice in the area of self-regulated learning, and each offers something of value to scholars and teachers alike. "One is the metaphor of acquisition, of learning new strategies and skills and applying them in school" (p. 96). In this view, teachers can teach strategies directly to learners, model good strategy use, and coach learners as to when and why strategies will be helpful to them. Modeling, in particular, is consistent with Bandura's views of self-efficacy and the observational learning processes that he proposed.

However, possessing a strategy is no guarantee that the learner will value or use it, especially when learning conditions change. As a result, critics of the so-called transmission model prefer a developmental metaphor in which students are presumed to become more self-regulated as they develop new competencies. Accordingly, they must have multiple experiences with the task conditions presented in Table 9.2 (Schunk & Zimmerman, 1994; Zimmerman, 1994). That is, learners must be given choices in and control over learning and motivation, with many opportunities for self-appraisal.

Table 9.3 provides a list of guidelines derived from both metaphors that can be used to help learners develop self-regulatory capabilities. It is important to remember, however, that developing self-regulation does not happen overnight. Rather, it is likely to be a lengthy and effortful process.

A good example of the time and effort it takes to develop self-regulatory skills can be seen in a graduate course that I teach, in which students are provided a great deal of control over what and how they learn. Students make choices about what to read in the course, what level of proficiency they want to attain, and how they will apply the concepts and ideas they are learning. To the extent possible, I also try to create a knowledge-building community in which the products of learning (i.e., students' assignments) are available for everyone in the community to read and use (e.g., Scardamalia & Bereiter, 1994).

What I have discovered in teaching this course is that even graduate students find it difficult to become self-regulated. The all-too-frequent lament is, "How am *I* supposed to know what to read? *You're* the teacher and you're not teaching me anything!" In time, along with appropriate instructional support and modeling from me (Pintrich, 1995), however, the students generally learn how to manage the learning resources and themselves to achieve their goals.

Summary

We have seen in the previous sections the influence of context and consequences on students' continuing motivation to learn. Motivation appears to be enhanced when learners' expectancies are satisfied and when they attribute their successes to their own efforts and effective learning strategies.

TABLE 9.3 *Guidelines for Facilitating the Development of Learners' Self-Regulation.*

1. Provide opportunities for learners to set their own goals and to manage the ways in which they attain those goals.
   - Learning goals are more effective than performance goals, and they should be challenging but attainable.
   - Modeling and directed reflection can help learners choose effective strategies for learning, managing their time, and controlling the context surrounding learning.
2. Provide opportunities for self-appraisal.
   - Analyzing personal styles of learning and comparing them to others can increase learners' awareness of different ways of learning.
   - Monitoring progress (what is known, what has been done, what is yet to be done or learned) can help learners adjust strategies, allocate their efforts, and revise their goals.
   - Periodic self-assessment can promote feelings of self-efficacy.
3. Create a reflective community.
   - The more opportunities and ways learners can reflect on their learning and that of others, the greater the habit of self-regulation.

Learners become increasingly self-regulated when they acquire skills to plan their learning, monitor their own progress, and evaluate the success of their efforts so as to improve their strategies in the future.

With these findings, taken together with those described in the first section, we are ready to consider an integrated model of motivational design. This attempts to answer the question, How can a teacher or instructional designer incorporate into instruction the appropriate motivational conditions for all learners?

A Model of Motivational Design

For the last 15 or so years, John M. Keller has been developing and testing an integrated model for understanding motivation and for systematically incorporating motivational concerns into instruction. He combines the variety of inputs to motivation that have already been discussed and suggests strategies for instruction that they imply. As you can see from Figure 9.4, Keller (1983, 1984) assumes that students' motives (or values), together with their expectancies (efficacy and outcome expectations), will influence the degree of attention and effort they will supply to a learning task. Although effort then contributes to performance, so, obviously, do the individual's current abilities, skills, and knowledge. Finally, both the consequences of

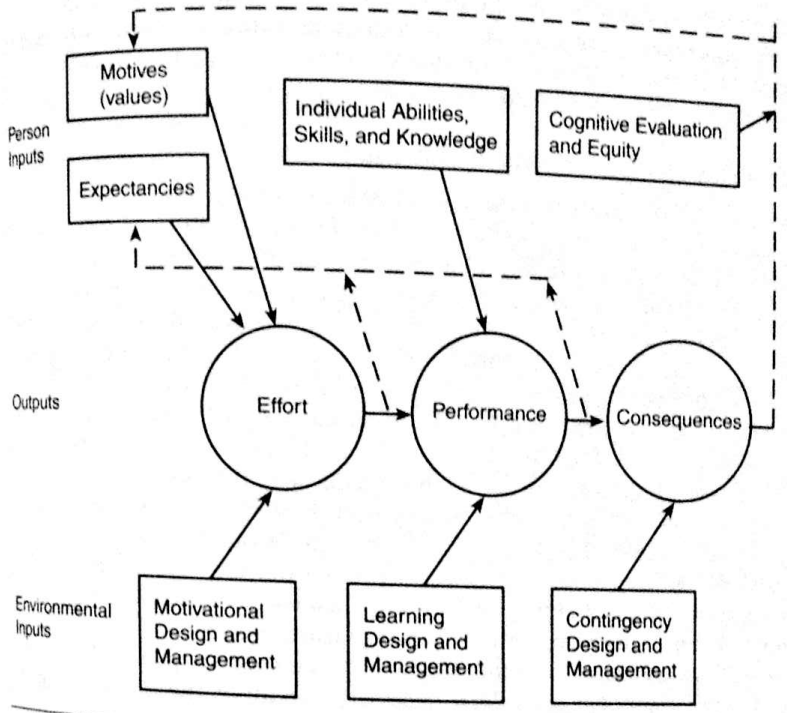

FIGURE 9.4 ***A Model of Motivation, Performance, and Instructional Influence***

Source: From Keller, J. M. A model of motivational design. In *Instructional-design theories and models.* Edited by C. M. Reigeluth, 1983, Hillsdale, NJ: Lawrence Erlbaum Associates. Copyright 1983 by Lawrence Erlbaum Associates. Reprinted by permission.

achievement (or the failure to achieve) and the learner's attributions (cognitive evaluation) concerning his or her performance influence motivation in future learning episodes.

In considering the instructional implications of this model, Keller (1983) proposed four conditions for motivation that must be met to have a motivated learner. These correspond to each of the four letters in the acronym, ARCS (Keller, 1984):

A—attention
R—relevance
C—confidence
S—satisfaction

As these are described further in the following section, you will see how they integrate and build upon the sources of motivation discussed earlier in the

chapter. Then, armed with a repertoire of these strategies, teachers and instructional designers may use the systematic process described by Keller (1987b) to effectively meet the motivational needs of their learners.

Strategies for Stimulating Motivation

Keller (1987a) appears to view the task of motivating learners as a sequential process. One must first gain the attention of learners and engage them in the learning activity before anything else can take place (*A*). Once involved, however, learners are known to ask the age-old question: "Why must I learn this?" Before instruction can proceed in an optimal way, then, students must believe that it is related to their personal goals and will meet their specific needs (*R*). Even with attentive learners who see personal relevance in the learning task, motivation can still flag as the activity wears on. Some, like Sean in the Workshop Worries scenario, may have fears about the subject that impede their learning it effectively. This is a problem of confidence (*C*). Others, despite their best efforts, may find their attention wandering if the pace and method of instruction never change (a problem of sustaining *A*). "Finally," Keller wrote, "comes the payoff. Or does it?" (1987a, p. 2). As we have seen earlier in the chapter, learning must result in a sense of satisfaction for students to have a continuing desire to learn (*S*).

What are ways, then, that teachers, trainers, or instructional designers can bring about the conditions necessary for motivation? Let's examine Keller's recommendations in each category.

Gaining and Sustaining Attention. Curiosity has already been described as a strong source of motivation, but one that can be fleeting. To make the most of curiosity caused by stimulus changes, teachers can capture students' interest by using novel or unexpected approaches to instruction or injecting personal experiences and humor. Keller himself, for example, often opens a presentation with a funny story that relates in some way to the topic of his talk. Other examples include beginning a class on American literature with a dramatic reading from a book under study, showing visual tricks in a class studying perception, or including a startling picture in the pages of a textbook.

To stimulate more lasting curiosity, or what Keller (1987a) called an attitude of inquiry, instructors should employ techniques that invoke a sense of mystery and involve students in solving problems. The CTGV instructional video series mentioned earlier in the chapter offers a good example. The instructional goal of one series specifically concerns mathematical problem-solving, but it is embedded in the context of a story about a kid named Jasper Woodbury. In one episode, Jasper plans a trip downriver to buy a boat and must contend with problems like the tide of the river, inclement weather, not enough gas, and so on. As students learn to solve these problems, they become able to solve analogous ones, such as how long would it take Jasper to reach his intended destination if he could only travel 15 mph, instead of 25 mph? Curiosity in the problem solving process is maintained, however, by the narrative character of the instruction. Not only are students interested in what will happen to Jasper next, they can create their own Jasper adventures (CTGV, 1990, 1991a, 1991b).

Finally, Keller (1983, 1987a) recommended that instructors maintain students' attention by varying the instructional presentation. No matter how interested someone is in the topic of a lecture, movie, demonstration, or audio presentation, that interest will wane in the face of unending sameness. Despite my best efforts and intrinsic interest in many nature specials on television, for example, I find myself nodding off after 15 or 20 minutes of listening to the narrator's well-modulated drone. Similarly, many students will lose interest or find their attention wandering when the instruction is always the same and therefore highly predictable. As a change of pace, lecturers might consider presenting some of their material via some form of media, or alternating lecture with demonstrations, small group discussions, or whole class debates. Likewise, printed text can be varied through different type sizes or fonts or the inclusion of diagrams or pictures. Soundtracks can be made more interesting by the use of two or more narrators and by a variation in format (conversation or interview as opposed to narration).

Enhancing Relevance. "Relevance, in its most general sense, refers to those things which we perceive as instrumental in meeting needs and satisfying personal desires, including the accomplishment of personal goals" (Keller, 1987a, p. 3). What Keller seems to describe with this statement are two aspects of the relevance problem, one that is ends-oriented and one that is means-oriented. To be motivated, learners must first recognize that given instruction has personal utility, i.e., will help them achieve personal goals (or ends). Instructors can assist in this recognition by providing statements of utility along with the goals of instruction, or helping learners to define their own goals and statements of utility. The latter strategy works particularly well in advanced topics with learners who have elected to study those topics. In an advanced research seminar I taught, for example, I asked students to determine their own goals and means of assessing progress toward goal attainment. The goals they pursued and the amount of work they completed generally exceeded the expectations I would have set for them.

A particular challenge for teachers arises in situations like the one described in the Camouflage Training scenario, where students fail to find relevance in a required course with prescribed instructional goals. Sometimes, motivating these students amounts to persuasion, often with assurances that the students will eventually see the relevance of what they are learning. In the interim, Keller suggests that means-oriented strategies may be useful.

Described earlier in the chapter were the concepts of need for achievement and need for affiliation. In terms of motivation, these needs have less to

do with what is taught than how something is taught. Therefore, teachers can help to motivate students by providing opportunities for matching their motives and values. These may include, for example, providing leadership opportunities, occasions for self-study or working in cooperative groups, or allowing friendly competition on individual or group projects. Rob does this when he challenges student teams to camouflage a jeep so well that he can't find it. Finding ways to actively engage students in learning can be an effective means of motivating them, irrespective of whether they yet see the relevance of the learning activities.

Finally, Keller includes familiarity as a component of relevance. As he put it, "People enjoy more about things they already believe in or are more interested in" (Keller, 1987a, p. 4). Therefore, to the extent possible, instructors should relate instruction to their learners' experiences by providing concrete examples and analogies. The more familiar something is, the more likely it is to be perceived as relevant to the learner. This recommendation should itself seem familiar. If you recall, the cognitive theories of learning (see Chapters 3 to 5) strongly emphasized the importance of a familiar and meaningful context for learning something new. It seems likely, then, that the facilitative effect of context on learning has both cognitive and affective (motivational) components.

Building Confidence. The research on self-efficacy that was reviewed earlier in the chapter established the importance of learners' confidence in their willingness to engage in learning. The question to be addressed here, then, is how to instill confidence in learners who believe they are unable to do, or fear they will fail if they attempt, a given learning task. Keller (1987a) suggested three strategies. First, instructors can create a positive expectation for success by making it clear just what is expected of students. Sometimes, fear of failure is simply fear of the unknown. Because students can be overwhelmed by a detailed discussion of performance requirements and evaluative criteria, Keller recommends progressive disclosure, or telling students what is expected of them as they are ready and able to understand the requirements. In addition, students can be shown how complex, seemingly unreachable goals are made more manageable by their being broken down into subgoals and small steps.

As we have seen from self-efficacy theory, students gain confidence in their own abilities when they actually experience success at challenging tasks. Therefore, a second strategy for building confidence is to provide success opportunities for students. This does not mean that students should never experience failure. Quite the contrary—failure experiences can be constructive, as long as (1) there is a good match between the challenge of the task and the learner's capabilities, (2) the learner's performance is self-initiated, and (3) the learner attributes failure to the poor use of strategies inherent to learning (Clifford, 1984).

Learners are also likely to gain confidence when they are given just enough assistance to perform a task that they are not quite capable of achieving on their own. If you recall from Chapter 7, Vygotsky proposed the "zone of proximal development" as that realm between what learners can achieve on their own and what they can achieve given assistance. Any learning task in this zone will be a challenge, but not an insurmountable one. Moreover, the teacher's goal concerning such tasks should be to gradually reduce his or her assistance until the learner is capable of independently performing the task.

Finally, consistent with attribution and self-regulation theory, instructors can build confidence by providing learners with a reasonable degree of control over their own learning and helping learners to recognize that learning is a direct consequence of their own efforts and effective learning strategies. Both Keller (1987a) and Clifford (1984) pointed to the importance of detailed, unambiguous feedback to students to maintain a task orientation and prompt appropriate attributions. A single score on a project or essay assignment, for example, provides little information to the student. The student, in turn, is likely to react with increased anxiety because no way has been provided to learn from his or her mistakes. A better approach would be for the instructor to conduct separate analyses and assign multiple scores for different aspects of the project or essay (e.g., organization, theme, use of resources, grammar, etc.). In this way, students can gain confidence from what they have done well and attribute poor performance to specific problems that can be corrected.

Generating Satisfaction. Keller (1987a) again suggested three categories of strategies for generating learning satisfaction, which correspond with natural consequences, positive consequences, and equity.

Opportunities to use newly acquired skills or knowledge in meaningful ways allow for the natural consequences of learning. So, for example, an arithmetic teacher might suggest to students that they calculate their school team's statistics as a means of practicing newly acquired arithmetic skills. Or, an engineering instructor might provide students with the design specifications called for in a completed contract, and then have students compare their designs to what was actually used. Simulations of all kinds work well to furnish appropriate learning environments within which students can tackle real-world problems.

As indicated earlier in the chapter, not all skills or knowledge readily lend themselves to immediate application. Sometimes, component skills or bits of knowledge must accumulate over a long period before they become useful. Alternatively, some students may have no particular interest in the subject but are enrolled to meet some external requirement. In these situations, the use of positive consequences, such as verbal praise, incentives, or real or symbolic awards, may be effective in generating satisfaction. At the conclusion of a training workshop, for example, the sponsoring agency might award participants with certificates of achievement.

"A final and important point," wrote Keller (1987a), "is that people do not look at rewards in isolation" (p. 6). Rather, they tend to make comparisons

do with what is taught than how something is taught. Therefore, teachers can help to motivate students by providing opportunities for matching their motives and values. These may include, for example, providing leadership opportunities, occasions for self-study or working in cooperative groups, or allowing friendly competition on individual or group projects. Rob does this when he challenges student teams to camouflage a jeep so well that he can't find it. Finding ways to actively engage students in learning can be an effective means of motivating them, irrespective of whether they yet see the relevance of the learning activities.

Finally, Keller includes familiarity as a component of relevance. As he put it, "People enjoy more about things they already believe in or are more interested in" (Keller, 1987a, p. 4). Therefore, to the extent possible, instructors should relate instruction to their learners' experiences by providing concrete examples and analogies. The more familiar something is, the more likely it is to be perceived as relevant to the learner. This recommendation should itself seem familiar. If you recall, the cognitive theories of learning (see Chapters 3 to 5) strongly emphasized the importance of a familiar and meaningful context for learning something new. It seems likely, then, that the facilitative effect of context on learning has both cognitive and affective (motivational) components.

Building Confidence. The research on self-efficacy that was reviewed earlier in the chapter established the importance of learners' confidence in their willingness to engage in learning. The question to be addressed here, then, is how to instill confidence in learners who believe they are unable to do, or fear they will fail if they attempt, a given learning task. Keller (1987a) suggested three strategies. First, instructors can create a positive expectation for success by making it clear just what is expected of students. Sometimes, fear of failure is simply fear of the unknown. Because students can be overwhelmed by a detailed discussion of performance requirements and evaluative criteria, Keller recommends progressive disclosure, or telling students what is expected of them as they are ready and able to understand the requirements. In addition, students can be shown how complex, seemingly unreachable goals are made more manageable by their being broken down into subgoals and small steps.

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"A final and important point," wrote Keller (1987a), "is that people do not look at rewards in isolation" (p. 6). Rather, they tend to make comparisons

between themselves and other people going through the learning experience with them. Satisfaction with a particular achievement might be dimmed by the observation that everyone else performed just as well or better. I can remember the first footrace I entered after having taken up running. It was eminently satisfying to actually finish the race, but even more so to finish in the middle of the pack and not last, which I had feared would happen.

Ways to handle equity, according to Keller, include making sure that learning outcomes are consistent with the expectations established at the outset of learning and maintaining consistent standards and consequences for task achievement. To revisit the running example, a colleague of mine did, in fact, finish last in his first footrace. But he derived great satisfaction from this accomplishment anyway because his only goal (and expectation) concerned running the race from start to finish at his own pace. Obviously, maintaining consistent standards throughout a course or training experience is essential for learners to feel that they have been fairly and equitably treated.

Summary. Table 9.4 presents a summary of the components of motivation, as proposed by Keller, along with strategies within each component that can contribute to the process of motivating learners. Recent studies of the ARCS model and its application have provided some interesting findings. First-year elementary school teachers, for example, used strategies in all four categories of ARCS, but those pertaining to relevance bore the strongest positive relationship to on-task behavior (Newby, 1991). In other words, "those classrooms in which there was a higher incidence of giving reasons for the importance of a task or in which students were encouraged to relate the task to their personal experiences showed a higher rate of on-task behavior" (Newby, 1991, p. 199). On the other hand, satisfaction strategies having to do with rewards and punishments produced a negative correlation with on-task behavior.

Motivational messages based on ARCS were tested in a staff development course for professionals from the Mozambique Ministry of Education and found to positively affect motivation in the course (Visser & Keller, 1990). Likewise, the motivation of college learners increased when relevance-enhancing strategies were embedded in instruction (Means et al., 1997). Finally, suggestions have been made to use ARCS as the basis for determining the motivational needs of adult learners (Bohlin & Milheim, 1994) and to incorporate it into instructional design models (Okey & Santiago, 1991).

How particular motivational strategies might be most effectively selected and implemented is discussed in the next section of the chapter.

The Process of Motivational Design

Think back for a moment to the scenarios with which this chapter began. Suppose Sean asked whatever questions would help clarify his confusions,

TABLE 9.4 ***Instructional Strategies for Stimulating Motivation as Suggested by the ARCS Model***

Component of Motivation	*Corresponding Strategies*
Gaining and sustaining attention	• Capture students' attention by using novel or unexpected approaches to instruction. • Stimulate lasting curiosity with problems that invoke mystery. • Maintain students' attention by varying the instructional presentation.
Enhancing relevance	• Increase the perception of utility by stating (or having the learners determine) how instruction relates to personal goals. • Provide opportunities for matching learners' motives and values with occasions for self-study, leadership, and cooperation. • Increase familiarity by building on learners' previous experiences.
Building confidence	• Create a positive expectation for success by making clear instructional goals and objectives. Alternatively, allow learners to set their own goals. • Provide opportunities for students to successfully attain challenging goals. • Provide learners with a reasonable degree of control over their own learning.
Generating satisfaction	• Create natural consequences by providing learners with opportunities to use newly acquired skills. • In the absence of natural consequences, use positive consequences, such as verbal praise, real or symbolic awards. • Ensure equity by maintaining consistent standards and matching outcomes to expectations.

and soldiers came to camouflage training interested and eager to learn these skills. Would they be a focus of attention in this chapter? Of course not. Only when there is evidence that motivation is a problem do we become concerned about how to solve it—how to motivate learners. The same holds true when it is suspected that motivation will be a problem, i.e., when learners, for whatever reasons, are expected to be uninterested, fearful, or generally disinclined to learn. The motivational design process, therefore, begins with

consideration of learner characteristics, or what Keller (1987b) calls audience analysis.

Step 1: Analyze the Audience. Who are your learners? How likely are they to be interested and ready to learn what you wish to teach? Before you can decide how to go about motivating learners, you must have some idea as to what motivational problems you are likely to face. Keller (1987b) recommended developing an audience profile using the ARCS model in order to identify any gaps in motivation. He noted as well that overmotivation can be as much a problem as undermotivation. For example, a person who claims to know it all already (i.e., is overconfident) is likely to pay little attention in class and make more mistakes as a consequence. Such a person might also prove to be a disruptive influence, diverting other students from assigned tasks.

An audience profile also helps you to determine when motivation is not a likely problem. Where learners are already motivated, it is neither necessary nor desirable to add motivational strategies to the instruction. Imagine your irritation when an instructor spends significant time telling you how valuable the course is and you already know just what you want out of it. Similarly, mediated materials (such as computer software) in which "bells and whistles" are used for motivational purposes may only annoy their users, who want to "get on with it."

Conducting an audience analysis, then, requires rating the attitudes of audience members in each of the categories of ARCS. In many cases, this will involve a "best guess" estimate based on past experience with similar learners. In some cases, however, Keller (1987a) suggested that it may be advisable to conduct interviews with members of the target population. This might be true, for example, in a situation in which one has no knowledge whatever of the learners on which to base an estimate.

In order to acquire a sense of the audience analysis process, consider the following hypothetical cases.

Case 1

A course in education is required of all persons seeking teacher certification in the state. Most of the students are upper division (junior, senior) and majoring in one of the teacher education areas of concentration. A few students come from disciplines outside education, and a few have already taken and failed the teacher certification test.

Hypothetical Analysis

Attention	Initially low. Education courses have a reputation for being low-level and boring. Also, since the course is required, students are likely to be there because they have to be, not because they want to be.

Relevance	Moderate to high. The goal of the course is to teach skills assessed by the teacher test. Therefore, most students will see the relevance of this course for meeting their certification goals.
Confidence	Variable. The education students will view this course as similar to others in which they have already been successful. They will therefore be quite confident in their ability to do well. Students from other disciplines, or students who have already failed the teacher examination, are likely to have genuine concerns about their ability to learn the skills necessary to pass the certification examination.
Satisfaction Potential	Moderate to high. As long as students find something useful in this course, something that enables them to be effective teachers and makes it likely they will pass the teacher test, they will feel satisfied.

Case 2

A literacy course is offered to farmers in an underdeveloped nation. The course is offered in the evening and populated by both men and women from the ages of 15 to 61. None of the students knows how to read.

Hypothetical Analysis

Attention	Variable. Because this is a volunteer audience, the fact that they have come at all indicates some level of attentiveness. However, since they are coming from work and are undoubtedly tired, they will require changes of pace and participatory activities to keep them attentive.
Relevance	Initially low. Participants are unlikely to view literacy as something meaningful to their lives, especially the older ones who have survived without knowing how to read.
Confidence	Initially low and probably variable. Most of the participants have probably had little, if any, formal schooling. Thus, they will be uncertain about their ability to learn to read.
Satisfaction Potential	Positive. If participants can be shown that literacy is a means for them to take control of their lives, then they will feel the effort of learning to read is worthwhile.

It should be obvious that both analyses rely upon assumptions made about the learners in each case. If different assumptions are made, or if other characteristics are known about the learners, then the resulting analyses are likely to be different as well. You may find it useful to imagine what sorts of learners would yield high or low ratings in each of the ARCS categories. For example, in what situations might learners have an especially low Satisfaction Potential but adequate ratings in the other three categories? When might they have low Confidence but high ratings in other categories? And so on.

Step 2: Define Motivational Objectives. From the audience profile, a teacher or instructional designer can determine what motivational needs exist and therefore what motivational objectives should be set. In both hypothetical cases, for example, learner attention and confidence are at levels below optimum. These are areas, then, that can be targeted for motivational design. Objectives need not be written, however, for satisfaction, since this showed high potential in both cases.

Like other types of instructional goals, motivational objectives should be written from the learner's perspective. That is, what change in learner performance or attitude is to be expected from achievement of this goal? So, for example, an objective for confidence that might be written for Case 2 is:

> Participants will indicate greater confidence in their ability to read by trying the read-aloud activities in class.

Or, an objective for attention that might be generated for Case 1 is:

> Students will indicate a higher degree of attention in class by participating in large group discussion and debate.

As you can see from these examples, the attainment of many motivational objectives can be assessed by direct observation. Most instructors, in fact, can sense whether particular motivational strategies have had the desired effect by the interactions they have with students in class. In some situations, though, self-report measures may be useful for determining whether motivational objectives have been met (Keller, 1987b). For example, participants in a technical training workshop might be asked if their confidence in applying these skills has been increased, or if they found the workshop worthwhile.

Step 3: Design a Motivational Strategy. In this step, specific motivational strategies are selected and integrated into instruction. Keller's ARCS categories serve as an obvious guide to this step, because there are strategies associated with each of the four motivational components of the model. However, these strategies are rather general in nature and must be tailored to the characteristics of the target learners and the subject matter being taught. Under attention, for example, a strategy used to stimulate an attitude of inquiry would be quite different for college students in an education course than for adult learners in a literacy class. Likewise, what tasks might be considered challenging would be quite different in the two cases.

Keller (1987a) recommended brainstorming many different ideas for accomplishing motivational objectives and then selecting those that might best fit the students, the style of the instructor, and the content and format of the instruction. Other factors, such as time and available resources, must also be considered.

Step 4: Try Out and Revise as Necessary. The final step of the motivational design process calls for the teacher or instructional designer to try out the strategies selected in the previous step. This might occur in a field trial of the instruction prior to its actual implementation, as in the formative evaluation of a course, workshop, or set of instructional materials. More likely, however, it occurs in the natural implementation of the instruction, as when a teacher meets her class and begins the school term. What is important about this step is that motivation should be thought about separately from other aspects of instruction (Kefler, 1987b). The instructor should attempt to be sensitive to what effects the motivational strategies are having, whether desired or undesired. Then, if the strategies are failing to produce intended results, they can be revised or replaced.

In some cases, revision of the motivational design is also warranted because the audience profile is faulty. In hypothetical Case 2, for example, the participants may already be aware of the important role literacy can play in their lives. If that is so, then a comment or two to confirm the relevance of the material can replace exercises or activities designed to establish relevance. Similarly, different instructional methods might be selected, or a different sequence of activities designed, for students who are found to be attentive, when low attention and interest were expected.

Summary. Table 9.5 displays a summary of the steps in the motivational design process which, together with the strategies summarized in Table 9.3, provide teachers and other designers of instruction with an effective means for enhancing motivation. Keller (1987b) also reminded us, however, to draw upon personal experiences while using his model:

> After all, we have been consumers of instruction for more years of our lives than we care to remember. We have seen many examples, and nonexamples, of motivating instruction. This personal knowledge combined with some formal knowledge of motivation and a systematic process for motivational design can be powerful tools in improving the motivational appeal of instruction. (p. 7)

TABLE 9.5 *Keller's Motivational Design Process*

Step 1: Analyze the audience and develop a motivational profile based on ARCS.

Example:
A—initially low
R—moderate to high
C—variable
S—moderate to high

Step 2: Define motivational objectives based on the audience profile.

Example:
1. Students will indicate a higher degree of attention in class by participating in group discussion and debate (**A**).
2. Students will exhibit greater confidence by setting and pursuing their own goals for an application project (**C**).

Step 3: Design a motivational strategy and integrate it into instruction.

Example:
1. Plan debates and discussion to be interspersed with lecture. Select media to accompany lecture (**A**).
2. Set up the structure for a self-study project (**C**).

Step 4: Try out and revise the strategy as necessary.

Example: Not enough direction given for the self-study project. Student still anxious, lacks confidence in ability to complete it on time. Therefore, provide more direction by breaking the project into more manageable subparts.

Motivation and Self-Regulation in "Kermit and the Keyboard"

There is ample evidence of both intrinsic motivation and self-regulation in the story "Kermit and the Keyboard." An unmotivated Kermit would not have decided to learn a new skill by himself. Instead, we can see highly goal-directed behavior. Kermit purchases a keyboard with particular capabilities, brings out of storage some music instruction books, buys some additional music fake books, and begins to systematically self-instruct. It is likely that he has high self-efficacy for this task, or a strong belief in his ability to learn to play the keyboard. Even though he has never played this particular instrument before, he was previously successful at learning to play clarinet

and saxophone and became proficient enough to play in a symphony and dance band. Such enactive mastery experiences are the most powerful type in facilitating positive self-efficacy.

His high self-efficacy makes it likely that Kermit will persist in his efforts, even in the face of difficulty. We do see, however, evidence that failure experiences have an adverse effect on Kermit's motivation to learn to play particular songs. He forsakes those on which he continues to make many mistakes in favor of those with which he is more successful. Likewise, he stops playing sooner when he experiences continued difficulty with a particular song.

Kermit demonstrates many competencies of self-regulation. He has set a distal and general goal—learning to play the keyboard—but he appears to set more proximal and specific goals as well, such as making a list of particular songs he would like to learn to play. His goals are very much mastery oriented, making them learning goals rather than performance goals. He does not worry about how his playing compares to that of others but focuses only on what he needs to do to improve his own skills.

Kermit plans particular activities that he thinks will facilitate his learning (e.g., practicing exercises as well as working on songs, practicing at a slower tempo and working up to the recommended tempo, reading particular sections of the manual), puts those plans into action, and adjusts his plans in light of his performance. For example, when he has difficulty understanding a feature of the keyboard he wants to learn, he consults his wife or goes on-line to seek assistance. The third phase of the self-regulation cycle—self-reflection—is perhaps the hardest to detect in this story, but we might see it in Kermit's contemplation about whether to join the Sunday jam sessions. He considers whether joining the group will enable him to learn more than the approach he is taking currently.

Theory Matrix

Theory	Motivation and Self-Regulation
Prominent Theorists	A. Bandura; J. M. Keller; P. R. Pintrich; D. H. Schunk; B. Zimmerman
Learning Outcome(s)	Goal-directed behavior Ability to set goals, monitor progress, and adjust learning strategies to assure goal attainment
Role of the Learner	Determine areas of interest and value Appraise utility of learning strategies and make necessary adjustments to improve the learning process Calibrate learning efforts with results
Role of the Instructor	Enhance motivation with strategies that gain attention, enhance relevance, foster confidence and ensure satisfaction Provide opportunities for learners to set goals, determine learning methods, and self-appraise
Inputs or Preconditions to Learning	Presence and participation in a learning environment.
Process of Learning	Not specifically addressed. Modern approaches to motivation and self-regulation are consistent with a social-cognitive view of learning.

Suggested Readings

Bandura, A. (1997). *Self-efficacy: The exercise of control.* New York: W. H. Freeman and Company.

Boekaerts, M., Pintrich, P. R., & Zeidner, M. (Eds.). (2000). *Handbook of self-regulation.* New York: Academic Press.

Schunk, D. H. & Zimmerman, B. J. (Eds.). (1994). *Self-regulation of learning and performance.* Hillsdale, NJ: Erlbaum.

Weiner, B. (1992). *Human motivation: Metaphors, theories, and research.* Newbury Park, CA: Sage Publications.

Reflective Questions and Activities

1. Consider what assumptions about knowledge and knowing may underlie the conceptions of learner motivation that are discussed in this chapter. With what