ROBERT J. MARZANO
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with TAMMY HEFLEBOWER

The Highly Engaged Classroom

THE CLASSROOM STRATEGIES SERIES

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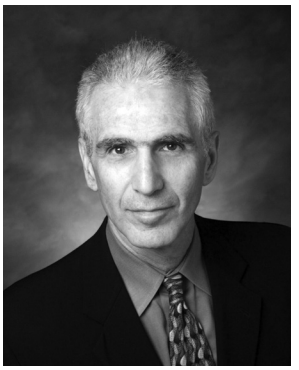

Dr. Robert J. Marzano is the cofounder and CEO of Marzano Research in Denver, Colorado. Throughout his forty years in the field of education, he has become a speaker, trainer, and author of more than thirty books and 150 articles on topics such as instruction, assessment, writing and implementing standards, cognition, effective leadership, and school intervention. His books include: *The Art and Science of Teaching: A Comprehensive Framework for Effective Instruction*, *Making Standards Useful in the Classroom*, *District Leadership That Works: Striking the Right Balance*, *Designing and Teaching Learning Goals and Objectives*, *Formative Assessment and Standards-Based Grading*, *On Excellence in Teaching*, and *Vocabulary Games for the Classroom*. His practical translations of the most current research and theory into classroom strategies are internationally known and widely practiced by both teachers and administrators. He received a bachelor's degree from Iona College in New York, a master's degree from Seattle University, and a doctorate from the University of Washington.

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ABOUT MARZANO RESEARCH

Marzano Research is a joint venture between Solution Tree and Dr. Robert J. Marzano. Marzano Research combines Dr. Marzano's forty years of educational research with continuous action research in all major areas of schooling in order to provide effective and accessible instructional strategies, leadership strategies, and classroom assessment strategies that are always at the forefront of best practice. By providing such an all-inclusive research-into-practice resource center, Marzano Research provides teachers and principals the tools they need to effect profound and immediate improvement in student achievement.

INTRODUCTION

The Highly Engaged Classroom is part of the series of books collectively referred to as *The Classroom Strategies Series*. The purpose of this series is to provide teachers as well as building and district administrators with an in-depth treatment of research-based instructional strategies that can be used in the classroom to enhance student achievement. Many of the strategies addressed in this series have been covered in other works such as *The Art and Science of Teaching* (Marzano, 2007), *Classroom Management That Works* (Marzano, 2003), and *Classroom Instruction That Works* (Marzano, Pickering, & Pollock, 2001). Although those works devoted a chapter or part of a chapter to particular strategies, *The Classroom Strategies Series* devotes an entire book to an instructional strategy or set of related strategies.

Engagement is obviously a central aspect of effective teaching. If students are not engaged, there is little, if any, chance that they will learn what is being addressed in class. A basic premise of this book is that student engagement happens as a result of a teacher's careful planning and execution of specific strategies. In other words, student engagement is not serendipitous. Of course, no teacher will have all students engaged at high levels all of the time; however, using the suggestions presented in this book, every teacher can create a classroom environment in which engagement is the norm instead of the exception.

We begin with a brief but inclusive chapter that reviews the research and theory on engagement. Although you could skip this chapter and move right into those that provide recommendations for classroom practice, you are strongly encouraged to examine the research and theory, as they are the foundation for the entire book. Indeed, a basic purpose of *The Highly Engaged Classroom* and others in *The Classroom Strategies Series* is to present the most useful instructional strategies based on the strongest research and theory available.

Because research and theory can provide only a general direction for classroom practice, *The Highly Engaged Classroom* (and each book in the series) goes one step further to translate that research into applications for the classroom. Specifically, it addresses four emblematic questions students ask themselves, the answers to which determine how involved students are in classroom activities.

The first question, "How do I feel?," addresses the affective side of learning. The second question, "Am I interested?," deals with the extent to which classroom activities intrigue students. These first two questions combined constitute what we refer to as *attention* (as opposed to *engagement*). Attention is a short-term phenomenon that ranges from a few seconds to a few minutes. Emblematic questions three and four deal with engagement—a more long-term phenomenon lasting beyond the parameters

of a single class period. Question three, "Is this important?," addresses the extent to which students perceive classroom goals as related to their personal goals. Question four, "Can I do this?," deals with the extent to which students have or cultivate a sense of self-efficacy. For each of these four emblematic questions, specific classroom strategies are provided in chapters 2 through 5.

How to Use This Book

The Highly Engaged Classroom was designed as a self-study text that provides an in-depth understanding of how to generate high levels of attention and engagement. As you progress through the chapters, you will encounter exercises. It is important to complete these exercises and then compare your answers with those in the back of the text. Such interaction provides a review of the content and allows you to examine how clearly you understand it.

Teams of teachers or entire faculties that wish to examine the topic of engagement in-depth may also use *The Highly Engaged Classroom*. When this is the case, teacher teams should do the exercises independently and then compare their answers in small-group and large-group settings.

Chapter 1

RESEARCH AND THEORY

Student engagement has long been recognized as the core of effective schooling. In the book *Engaging Schools*, the National Research Council's Committee on Increasing High School Students' Engagement and Motivation to Learn (2004) explains that "research on motivation and engagement is essential to understanding some of the most fundamental and vexing challenges of school reform" (p. 14).

Despite its obvious importance to teaching and learning, engagement is not an easily defined construct. As Ellen Skinner, Thomas Kindermann, James Connell, and James Wellborn (2009) stated, "There is, of course, no single correct definition of *engagement*" (p. 224). They noted that a variety of constructs seem to overlap in meaning and use—specifically *motivation*, *engagement*, *attention*, *interest*, *effort*, *enthusiasm*, *participation*, and *involvement*. Because our audience is the classroom teacher as opposed to researchers and theorists, we do not attempt to reconcile differences among researchers and theorists regarding Skinner and her colleagues' constructs. Rather, our attempt is to articulate an internally consistent perspective on engagement that K–12 classroom teachers can use to plan and execute specific strategies that enhance student engagement. We first examine the four topics that constitute our model of attention and engagement and are typical aspects of any engagement discussion: (1) emotions, (2) interest, (3) perceived importance, and (4) perceptions of efficacy.

Emotions: How Do I Feel?

With every new situation, feelings affect human behavior. In a sense, we ask the question "How do I feel?" If our emotions are negative in that moment, we are less likely to engage in new activities or challenging tasks. Skinner et al. (2009) associated the following emotions with engagement:

- Enthusiasm
- Interest
- Enjoyment
- Satisfaction
- Pride
- Vitality
- Zest (p. 227)

In addition, they associated the following emotions with a lack of engagement, or "disaffection" as they referred to it:

- Boredom
- Disinterest
- Frustration
- Anger
- Sadness
- Worry/Anxiety
- Shame
- Self-blame (p. 227)

It is certainly true that the first set of emotions can be considered effects of high engagement—when students are engaged, they tend to experience enthusiasm, enjoyment, and the like. However, teachers can also think of these emotions as affective states that set the stage for engagement—when students feel enthusiastic or zestful, they are more disposed to engage in new behaviors and tasks.

In his review of the research on motivation, Reinhard Pekrun (2009) explained that emotions affect a wide variety of human behaviors, one of which is engagement. Indeed, Gary Ladd, Sarah Herald-Brown, and Karen Kochel (2009) identified emotional engagement as one of a number of types of engagement (others include cognitive engagement and behavioral engagement). The classroom certainly influences many aspects of emotional engagement. Here we consider three: (1) students' energy levels, (2) a teacher's positive demeanor, and (3) students' perceptions of acceptance.

Students' Energy Levels

One primary factor in how students answer the question "How do I feel?" is the level of activity in the classroom (National Research Council, 2004). The activity in a classroom affects students' energy, or what some psychologists refer to as *arousal*. Elizabeth Styles (1997) explained arousal in the following way:

> [It] is rather like a limited power supply: if you turn on the rings of a gas cooker, and the central heating boiler fires up, the height of the gas jets in the cooker rings goes down. There is only a limited supply of gas to these two appliances, and the demand from the boiler reduces the amount of fuel available to the cooker. (p. 140)

Styles's characterization indicates that any classroom task that raises the level of activity in the classroom can help heighten students' energy levels. Maintaining a lively pace can help keep energy high. Edmund Emmer and Mary Claire Gerwels (2006) explain that "the teacher needs to keep the activity moving and avoid interruptions to the activity flow by using good pacing" (p. 423). Pacing is key when transitioning from one activity to another. Poorly orchestrated transitions can waste time and create a lull in classroom activity, making it difficult for students to stay engaged (Arlin, 1979). Efficient transitions that teachers have practiced in class allow students to quickly respond to brief signals.

Another classroom factor related to energy level is the amount and type of physical movement that occurs within the classroom. Eric Jensen (2005) cited a number of studies that connect physical activity to enhanced engagement (Dwyer, Blizzard, & Dean, 1996; Dwyer, Sallis, Blizzard, Lazarus, & Dean, 2001). Jensen (2005) explained this connection in terms of oxygen: "Oxygen is essential for brain function, and enhanced blood flow increases the amount of oxygen transported to the brain. Physical activity is a reliable way to increase blood flow, and hence oxygen, to the brain" (p. 62). Jensen (2005) also noted, "Amazingly, the part of the brain that processes movement is the same part of the brain that processes learning" (p. 61).

Supporting Jensen's assertions is the fact that regular physical exercise has been associated with improved cognitive functioning (Colcombe & Kramer, 2003). Physical activity seems to have a particularly beneficial effect on executive functioning. According to Sabine Kubesch et al. (2009), executive functioning affects a wide variety of cognitive processes such as planning, decision making, and recognizing and correcting errors. As it relates to student engagement, physical exercise has been shown to enhance students' abilities to attend to classroom activity—even in the face of distraction. Specifically, Kubesch et al. (2009) examined the effects of a single thirty-minute exercise program with thirteen- and fourteen-year-old students. They reported their findings as follows: "In our study, we showed that a single PE program of 30 min leads to an improvement in the maintenance of on-task attention in the face of distraction. This, in turn, may support students' selective, sustained, and focused attention processes" (p. 240).

A Teacher's Positive Demeanor

A positive demeanor on the part of the teacher is the second and most general influence on emotional engagement. The teacher can communicate a positive demeanor in a number of ways, one of which is through demonstrating enthusiasm and intensity, both of which have been associated with student engagement and achievement (Bettencourt, Gillett, Gall, & Hull, 1983; Armento, 1978; McConnell, 1977). Barak Rosenshine (1970) surmised that teacher enthusiasm facilitates student achievement "because animated behavior arouses the attending behavior of pupils" (p. 510). Other studies support this notion (Coats & Smidchens, 1966; Land, 1980; Mastin, 1963; Williams & Ware, 1976, 1977; Wyckoff, 1973).

Thomas Good and Jere Brophy (2003) described intensity and enthusiasm in the following way:

> An intense presentation will begin with a direct statement of the importance of the message ("I am going to show you how to invert fractions—now pay close attention and make sure you understand these procedures"). Then, the message itself is presented using verbal and nonverbal public speaking techniques that convey intensity and cue enthusiasm: a slow-paced, step-by-step presentation during which key words are emphasized; unusual voice modulations or exaggerated gestures that focus attention on key terms or procedural steps; and intense scanning of the group following each step to look for signs of understanding or confusion (and to allow anyone with a question to ask it immediately). In addition to the words being spoken, *everything about the teacher's tone and manner communicates to the student that what is being said is important* and that they should give it full attention and ask questions about anything they do not understand. (p. 238)

Brophy (2004) emphasized that teachers should be enthusiastic regularly and intense selectively. About enthusiasm he says:

> Students take cues from the teacher about how to respond to school activities. If you present a topic or assignment with enthusiasm . . . your students are likely to adopt this same attitude. . . . *Projecting enthusiasm does not mean pep talks or phony theatrics*. . . .You can use dramatics or forceful salesmanship if you are comfortable with these techniques, but if not, low-key but sincere statements of the value that you place on a topic or activity will be just as effective. (pp. 274–275)

Brophy (2004) explained that intensity is communicated through timing, verbal and nonverbal expressions, and gestures that tell students the material is important and deserves close attention. Often, intensity is first signaled by statements like "I'm going to show you how to balance this type of equation. This is important, and I need you to pay close attention." Brophy (2004) cautioned, "Pick your spots for using such an intense communication style. You cannot be so intense all the time, and even if you could, your students would adjust to it so that it would lose much of its effectiveness" (p. 276).

A teacher's positive demeanor is also communicated by using humor. In the book *Laughing and Learning*, Peter Jonas (2010) summarized the research on the relationship between humor and student achievement and engagement. He noted that "using humor to improve classroom instruction is not only supported by research, but it has proven to be successful" (p. 27). Jonas's positive findings for using humor in the classroom included the following:

- Humor was associated with a 40 percentile point gain in instructional effectiveness.
- Humor can change the culture of a classroom.
- Humor is associated with enhanced productivity.
- Humor reduces stress in students.
- Humor promotes creative thinking.

Students' Perceptions of Acceptance

Students' perceptions of acceptance is the third determiner of how they feel about themselves and the classroom environment. Stated differently, if students sense that they are not welcome, accepted, or supported in the classroom, it is unlikely that they will engage in classroom activities. Certainly, the relationship teachers have with students is one of the most powerful determiners of how a student answers the question "How do I feel?" Carol Goodenow (1993) found teacher support was consistently the strongest predictor of motivation among students in sixth through eighth grades. Kathryn Wentzel (2009) explained the importance of the relationship teachers have with students in the following way:

> Secure relationships are believed to foster children's curiosity and exploration of the environment, positive coping skills, and a mental representation of oneself as being worthy of love and of others being trustworthy. In contrast, insecure attachments are believed to result in either wary or inappropriately risky behavior, difficulty in regulating stress in new settings, and negative self-concepts. (p. 302)

Ladd et al. (2009) explained that peer relationships are equally as important as teacher-student relationships:

> When peers dislike persons within their group they tend to act in rejecting ways toward these children (e.g., ignoring, excluding them from activities), and these behaviors become observable indicators of rejection not only for rejected children but for the larger peer group. (p. 327)

One might make a case that peer relationships have an even stronger effect on students than their relationships with teachers. For example, a study by Ladd et al. (2009) found that the longer students were rejected by their peers, the less likely they were to participate in classroom activities. However, when students moved out of rejection status, they tended to re-engage. They noted that the most profound cases of disengagement were observed in students whose peers continually rejected them throughout grade school.

Clearly the relationships students have with the teacher and with their peers have a profound effect on their perceptions of being welcomed, accepted, and supported, which, in turn, help establish an affective tone that either promotes or discourages student engagement. A teacher can take concrete steps to foster accepting and supportive teacher-student and peer relationships, thus increasing the probability that students will respond positively to the emblematic question "How do I feel?" We consider many of those strategies in chapter 2.

Interest: Am I Interested?

A second emblematic question that influences engagement is "Am I interested?" Even if an individual is engaged emotionally (responds positively to the question "How do I feel?"), he or she may still fail to engage in a new activity simply because he or she doesn't perceive it as interesting.

Ulrich Schiefele (2009) summarized much of the research on interest and made a distinction between *situational interest* and *individual interest*. According to Schiefele, "Situational interest describes a short-term psychological state that involves focused attention, increased cognitive function, persistence, enjoyment or affective involvement, and curiosity" (p. 198). A student paying particular attention to a science teacher's demonstration because it appears to defy the laws of gravity is an example of situational interest. The situation captures the student's attention. Individual interest, on the other hand, is more of a long-term phenomenon, and represents one's general disposition toward a specific topic. For example, an individual's personal interest in hockey lasts well beyond a specific situation. In this section, we focus on situational interest. The topic of individual interest is more germane to the next section on perceived importance.

Suzanne Hidi and William Baird (1986) and Mathew Mitchell (1993) distinguished between two forms of situational interest. *Triggered situational interest* involves capturing a student's attention. *Maintained situational interest* involves holding a student's interest over time. Both of these types of situational interest are important to the classroom teacher, who must catch and then hold attention. How does this happen? To answer this question, we begin with a model of the interaction between three types of memory: *sensory memory*, *working memory*, and *permanent memory* (fig. 1.1).

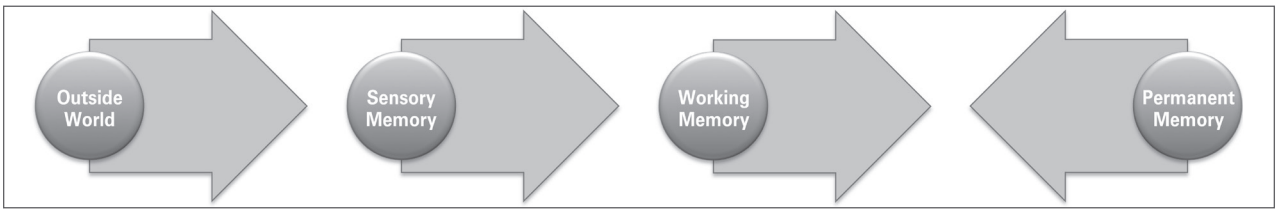

Figure 1.1: Model of interaction between three types of memory.

Sensory memory addresses temporary storage of data from the senses. As indicated in figure 1.1 (page 7), it is the conduit from the outside world. John Anderson (1995) described sensory memory in the following way:

> Sensory memory is capable of storing more or less complete records of what has been encountered for brief periods of time, during which people can note relationships among the elements and encode the elements in a more permanent memory. If the information in sensory memory is not encoded in the brief time before it decays, it is lost. What subjects encode depends on what they are paying attention to. The environment typically offers much more information at one time than we can attend to and encode. Therefore, much of what enters our sensory system results in no permanent record. (p. 160)

At any moment in time, then, a myriad of stimuli bombard an individual's senses and not all the stimuli are attended to. More specifically, only those that reach working memory become part of a person's conscious attention.

As its name implies, working memory is where data are actively processed. As illustrated in figure 1.1 (page 7), working memory can receive data from the outside world through sensory memory or from permanent memory. Even though working memory can hold only small amounts of information for a single situation, there is no theoretical limit to the amount of time information can reside there. As long as an individual focuses conscious attention on the data in working memory, those data stay active. To this extent, working memory is the seat of consciousness. A person's experience of consciousness is actually his or her experience of what is being processed in working memory (Dennett, 1969, 1991).

Permanent memory contains all stored experiences and all learned knowledge. For example, a student's memory of what occurred in class the previous day is stored in permanent memory, sometimes referred to as episodic memory (Buckner & Barch, 1999). Students' understanding of a topic like the cell membrane or the Civil War is also stored in permanent memory, sometimes referred to as a declarative memory (Anderson, 1995). Finally, permanent memory is where skills and processes such as balancing an algebraic equation, editing a composition for overall logic, or hitting a baseball are stored. This is sometimes referred to as production memory or procedural memory (Anderson, 1995).

The relationships between the three types of memory help explain triggered situational interest and maintained situational interest. If information does not get into working memory, it has no chance of being processed. Because working memory cannot hold very much information for a single situation, there is a constant battle, so to speak, between the outside world and the inside world (permanent memory) as to what working memory will store. The information from the outside world must trigger interest to get into working memory. However, simply triggering interest does not suffice. Information must be kept in working memory throughout a class period or at least part of a class period if it is to be encoded. Sustained occupation of working memory is called maintained situational interest.

The preceding description highlights the challenges a teacher faces on a day-to-day basis. While in class, a teacher is always vying for students' attention. If what is occurring in class does not capture and hold students' attention (enter and then occupy their working memories), then students will turn their attention to information from their permanent memories that has nothing to do with the classroom, such as last night's basketball game or seeing a boyfriend or girlfriend during the previous class. Here

we discuss four ways to trigger and maintain situational interest: (1) using game-like activities, (2) initiating friendly controversy, (3) using unusual information, and (4) using effective questioning strategies.

Game-Like Activities

A number of classroom activities have the potential to capture and hold students' attention. Game-like activities help trigger situational interest and provide a foundation for maintained situational interest because they tap into the psychological principle of *clozentropy* (see Broadhurst & Darnell, 1965; Darnell, 1970, 1972; Taylor, 1953; Weiner, 1967). Basically, the theory of clozentropy states that the human mind will naturally attend to situations that have missing details. Hermann Ebbinghaus (1987) addressed this point, noting that human beings tend to fill in the blanks when presented with incomplete information. Based on this theory, Wilson Taylor (1953) developed a method of testing English proficiency that systematically leaves out words from text. To illustrate, consider the following: Mary went to the _____ to swim but she found that she forgot her _____. As you read this incomplete sentence, your mind naturally fills in words such as *pool* and *bathing suit*.

Incongruity Theories

Incongruity theories also support the utility of game-like activities to generate situational interest. As George Loewenstein (1994) explained, incongruity theories postulate that human beings have a natural tendency "to make sense of the world" (p. 82). Fundamentally, any activity with a rich contextual background that presents students with missing information will trigger situational interest. Games certainly fit into this category (Mitchell, 1992). A number of meta-analyses have been conducted on the effects of games and game-like activities on student achievement (see table 1.1).

Table 1.1: Meta-Analyses of the Effects of Games and Game-Like Activities on Student Achievement

Synthesis Study	Number of ESs	Average ES	Percentile Gain
Szczurek, 1982[a]	58	0.33	13
VanSickle, 1986[a]	42	0.43	17
Haystead & Marzano, 2009	62	0.46	18

[a]Reported in Hattie (2009).

Table 1.1 reports the results of three meta-analyses. Critical to understanding table 1.1 are the concepts of meta-analysis and effect size (ES), which appendix B (page 183) explains in some depth. Briefly though, a *meta-analysis* is a research technique for synthesizing a series of studies on the same topic. Typically, meta-analytic studies report their findings in terms of average ESs (see the average ES column in table 1.1). An *effect size* tells you how many standard deviations larger (or smaller) the average score for a group of students who were exposed to a given strategy (in this case, games and game-like activities) is than the average score for a group of students who were not exposed to a given strategy (in this case, no games). In short, an ES tells you how powerful a strategy is; the larger the ES, the more the strategy increases student learning.

ESs are typically small numbers. However, small ESs can translate into big percentile gains. For example, the average ES of 0.43 calculated by Ronald VanSickle (1986) translates to a 17 percentile point gain. (See appendix B, page 183, for a detailed description of ESs and a chart that translates ES numbers into percentile gains.) Another way of saying this is that researchers would predict a student at the

fiftieth percentile in a class where games and game-like activities were not provided (an average student in that class) to rise to the sixty-seventh percentile if he or she were provided with games or game-like activities.

The third report in table 1.1 (Haystead & Marzano, 2009) was conducted at Marzano Research with classroom teachers. It is particularly relevant to the perspective of this book because it informed many of the strategies presented in chapter 3.

Inconsequential Competition

Inconsequential competition is an aspect of games that can help trigger and maintain situational interest. Good and Brophy (2003) explained:

> The opportunity to compete can add excitement to classroom activities, whether the competition is for prizes or merely for the satisfaction of winning. Competition may be either individual (students compete against everyone else) or group (students are divided into teams that compete with one another). (p. 227)

As its name implies, inconsequential competition has no consequence regarding students' grades or status, it is simply done for fun (Marzano, 2007). However, this type of competition can stimulate a mild form of pressure that naturally comes with a competitive situation. It is important to note that pressure can be deleterious to well-being in general (Ito, Larsen, Smith, & Cacioppo, 2002; Roozendaal, 2003). However, it is also true that mild pressure can help focus attention (Cahill, Gorski, & Lee, 2003; Shors, Weiss, & Thompson, 1992; Van Honk et al., 2003).

Consequently, when playing games, pressure should remain at the right level of intensity and duration to provide positive benefits for engagement. Specifically, teachers should organize competitive games in such a way that students enjoy the challenge but do not feel compelled to win. Competition might have a negative consequence in that it could embarrass some students on losing teams (Epstein & Harackiewicz, 1992; Moriarity, Douglas, Punch, & Hattie, 1995; Reeve & Deci, 1996). In response to losing, team members may scapegoat individuals they believe are responsible for the team loss (Ames, 1984; Grant & Dweck, 2001; Johnson & Johnson, 1985). This caution noted, if teams are constantly reorganized so all students have a chance to experience winning and losing, teachers can avoid this potentially negative consequence.

Friendly Controversy

Another way to trigger and maintain situational interest is through controversy. David Johnson and Roger Johnson (1979) explained that within any learning situation, academic conflicts will naturally arise. "They will occur no matter what the teacher does" (p. 51). However, they noted that "the current evidence indicates that in most classrooms conflicts are avoided and suppressed" (p. 51). In their review of the research, they built a strong case for the fact that conflict can be used in the classroom to enhance student achievement, noting that "controversies among students can promote transitions to higher stages of cognitive and moral reasoning" (p. 55).

Good and Brophy (2003) described controversy strategies in the following way: "Controversy strategies include eliciting divergent opinions on an issue and then inviting students to resolve their discrepancies through sustained discussion" (p. 240). Johnson and Johnson (1985) explained that "*controversy* exists when one person's ideas, information, conclusions, theories, or opinions are incompatible

with those of another person and the two seek to reach an agreement" (p. 238). They distinguished this from *debate*: "*Debate* exists when two or more students argue positions that are incompatible and a winner is declared on the basis of who presented their position best" (pp. 238–239).

Nancy Lowry and David Johnson (1981, as cited in Loewenstein, 1994) conducted one of the most frequently cited studies on the positive effects of controversy in the classroom. Fifth and sixth graders were randomly assigned to groups that foster either consensus or controversy. The hypothesis under investigation was that the controversy groups would stimulate more curiosity in students. In fact, students in the controversy group expressed more interest in the topic, reported more study time on the topic, and used more special sources such as those found in the school library. Perhaps the most interesting finding in the study was that, when presented with opportunities to view an optional film about the topic during recess, 45 percent of the controversy group attended, whereas only 18 percent of the consensus group attended.

In a later study, Johnson and Johnson (1985) examined the effects of three treatments of a specific topic. One group of fifth- and sixth-grade students studied the topic individually, though they were involved in group discussion about the topic. Another group engaged in a cooperative debate, the purpose of which was to logically debate the two sides of the issue. The third group engaged in cooperative controversy. Where the cooperative debate group focused on winning an argument, the cooperative controversy group focused on exploring differences in perspective and opinion. Relative to the other groups, the cooperative controversy group excelled in actively searching for information about the topic, re-evaluating its own position, and developing accepting and supportive relationships among students with and without physical challenges. Members of the group also demonstrated the most attitudinal change, the most interest in the subject matter, and the highest self-esteem. The students in the cooperative debate group were superior to those in the individual learning group but not superior to the cooperative controversy group on these measures. Johnson and Johnson (1985) concluded that both cooperative debate and cooperative controversy are useful instructional tools, but cooperative controversy is the more powerful relative to a variety of outcomes.

Unusual Information

A third activity that triggers and helps maintain situational interest is the use of unusual information. Brophy (2004) explained this in the context of curiosity, noting that "student curiosity is the driving force that underlies many theorists' suggestions for motivating students" (p. 227). Apparently, the behavioral effects of interest cross species. Loewenstein (1994) reported that "animals and humans seek out environmental variability. For example, a large number of studies showed that rats would explore the less familiar of two arms of a maze" (p. 77). Martin Covington and Karen Teel (1996) cited the use of oddities to help capture students' attention. Brophy (2004), however, warned that overuse and superficial use of unusual information and oddities "may focus [students'] curiosity on seductive but trivial details" (p. 227). Additionally, he noted that when they are used superficially, students "may lose interest in the topic once their initial curiosity is satisfied" (p. 227).

Effective Questioning Strategies

Finally, effective questioning strategies can trigger situational interest and help foster maintained situational interest. Specifically, it makes intuitive sense that when a student is answering a question, his or her working memory is fully attentive to the task at hand. Students' attention to questions is most likely due to the fact that a question, by definition, presents missing information. To this extent, ques-

tions are like games. Indeed, many games rely on questions. In the context of the classroom, questions can generate mild pressure that helps stimulate attention.

The research on the effects of questioning strategies supports their potential utility. Table 1.2 reports some of the findings on the effects of questioning.

Table 1.2: Studies on the Effects of Questioning Strategies on Student Achievement

Synthesis Study	Number of ESs	Average ES	Percentile Gain
Redfield & Rousseau, 1981[a]	14	0.73	27
Samson, Strykowski, Weinstein, & Walberg, 1987[a]	14	0.26	10
Gliessman, Pugh, Dowden, & Hutchins, 1988[a]	26	0.82	29
Gayle, Preiss, & Allen, 2006[a]	13	0.31	12
Randolph, 2007[a]	18	0.38	15
Wise & Okey, 1983[b]	11	0.56	21
Walberg, 1999[b]	14	0.26	10

[a]Reported in Hattie (2009)

[b]Reported in Marzano (2007)

As reported in table 1.2, the expected gains associated with questioning range from 10 to 29 percentile points. One of the problems with questioning as an engagement strategy is that once an individual student answers a question, the others in class may disengage. Consequently, increasing the number of students who respond to any given question helps capture the working memories of more students. Indeed, increasing the rate at which students respond is a commonly mentioned technique to increase the effectiveness of instruction (Good & Brophy, 2003).

Perceived Importance: Is This Important?

"Is this important?" is the third emblematic question that affects engagement. If the answer to this question is yes, students are more likely to stay involved in the tasks at hand. What then, makes something important or unimportant to a student? The answer to this question is found in the research and theory on goals.

Robert Marzano and Jana Marzano (2009) explained that the human mind is comprised of a hierarchy of goals. At the lower levels are goals that address basic subsistence needs such as food, comfort, and shelter. Above these are short-term goals such as scheduling a date or getting a good grade on a quiz. Above short-term goals are long-term goals such as making a varsity sports team and playing first-string all season or completing a semester-long thesis for an honors class. Even higher on the hierarchy are longer-term goals—those at the very top being lifelong goals. When a student is operating on higher levels of the hierarchy, he or she is more engaged. Therefore, the more a teacher can tap into students' higher-level goals, the more engaged the class as a whole will be. Here we discuss where all goals are stored, the self-system, as well as how personal goals motivate student engagement. We also address the role of cognitively challenging tasks in helping students perceive classroom activities as important.

The Self-System

Some cognitive psychologists postulate that human goals are housed in the *self-system* (Harter, 1982; Markus & Ruvolo, 1989). By definition, the self-system is part of permanent memory. Rather than memories of past events (episodic memories), information (declarative memory), or skills and processes (procedural memory), the self-system contains goals that individuals bring to every situation. Whether an individual engages in a particular activity or not is dependent on whether he or she perceives that activity as relevant to one or more goals in the self-system. From this perspective, the self-system can be viewed as the architect of human motivation. Barbara McCombs and her colleagues (McCombs, 1984, 1986, 1989; McCombs & Marzano, 1990) described the self-system in the following way:

> The self as agent, as the basis of will and volition, can be thought of, in part as a generative structure that is goal directed. . . . It . . . consciously or unconsciously defines who we are, what we think, and what we do. (McCombs & Marzano, 1990, p. 66)

Mihaly Csikszentmihalyi (1990) described the self-system as follows:

> The self is no ordinary piece of information. . . . In fact, it contains [almost] everything . . . that passes through consciousness: all the memories, actions, desires, pleasures, and pains are included in it. And more than anything else, the self represents the hierarchy of goals that we have built up, bit by bit over the years. . . . At any given time, we are usually aware of only a tiny part of it. (p. 34)

Monique Boekaerts (2009) echoed Csikszentmihalyi's comments about the hierarchic nature of goals:

> It is generally accepted that a small set of higher order goals, or principles, should be placed at the apex of a hierarchical goal network. This set of basic principles contributes most to a person's sense of Self, because the principles represent the person's basic values and the traits that he or she considers ideal. As such, higher order goals provide general organization and orientation to a person's life and optimize personal meaning and making processes. (p. 110)

Goals then, are endemic to the human condition. In some manner, people view every situation in their lives through the filter of their goals. As Boekaerts (2009) explained, every student enters class every day with goals that drive his or her behavior:

> I am convinced that all students live in a multigoal environment, and that much of their daily activities concern decision making about how much of their limited resources they will invest in the many goals that they consider salient at that point in time. (p. 106)

Unfortunately, the error that some educators make is to assume that the academic goals offered by the district, school, or individual teacher overlap with students' personal goals.

Personal Goals

One clear message from the research and theory on the goal-directed nature of human behavior is that students are more likely to engage in school goals that are linked to their personal goals. As we shall see in chapter 4, this generalization provides guidance for a number of classroom strategies that