Differentiated Instructional Strategies Creating a Climate for Learning

Classrooms everywhere offer a diversity of faces and shapes and sizes, but underneath the diversity there are fundamental elements that all learners need in order to succeed and to feel positive about their experiences in school.

**WHAT DO LEARNERS NEED TO SUCCEED?**

For students to succeed, they need to believe that they can learn, and that what they are learning is useful, relevant, and meaningful for them. They need to know that they belong in the classroom and that they are responsible for their own learning as well as their own behavior. In *Education on the Edge of Possibility*, the Caines (Caine & Caine, 1997) state,

Teachers’ beliefs in and about human potential and in the ability of all children to learn and achieve are critical. These aspects of the teachers’ mental models have a profound impact on the learning climate and learner states of mind that teachers create. Teachers need to understand students’ feelings and attitudes will be involved and will profoundly influence student learning. (p. 124)

Effective teachers believe that all students can learn and can be successful. Effective teachers consciously create a climate where all students...
feel included. Effective teachers believe that there is potential in each learner and commit to finding the key that will unlock that potential.

**CLASSROOM CULTURE AND LEARNING COMMUNITIES**

Culture is often referred to as “the way we do things around here.” People who live and work in a culture sometimes can’t explain or describe it, but they can certainly sense it. Culture may not necessarily be conveyed only through words but also through actions. Sometimes what we do screams so loudly that we can’t hear what is being said. In the words of DePorter, Reardon, and Singer-Nourie (1998) in their book *Quantum Teaching*, “*Everything Speaks, Everything Always.*” They caution teachers that what they do, say, and allude to have an effect on learners and their perception of success. According to Parry and Gregory (1998),

> As far as the brain is concerned, actions speak louder than words. Everything that happens in the classroom is monitored by three parts of the brain, two of which have no spoken language but are very adept at reading body language and tone of voice. Every gesture, every inflection, and every invasion of personal space is monitored by the limbic system and evaluated in terms of its threat potential. These skills allowed our ancestors to survive and they are still alive and well in all of us. (p. 13)

Because our brain is a parallel processor, it absorbs information on a conscious and an unconscious level. The brain constantly performs many functions at the same time (Ornstein & Thompson, 1984). It therefore can manage to process thoughts, emotions, and perceptions simultaneously.

The brain is also a parallel processor in that it facilitates learning by involving both focused attention and peripheral perception. O’Keefe and Nadel (1978) state that the brain responds to the entire sensory context in which learning takes place. A peripheral stimulus includes everything in the classroom from the drab or colorful walls to subtle clues such as a look or gesture that conveys meaning and is interpreted by the brain. All sounds and visual signals are full of complex messages. A sarcastic remark or gesture can speak volumes to a sensitive learner. It conveys far more than the spoken word.

In his work with the Midcontinent Research for Education and Learning (McREL) group and with Dimensions of Learning, Robert Marzano examined the climate for learning, as did Jay McTighe:
Closely related to teachers’ behavior is the development of a classroom climate conducive to good thinking... students cannot think well in a harsh, threatening situation or even in a subtly intimidating environment where group pressure makes independent thinking unlikely. Teachers can make their classrooms more thoughtful places by demonstrating in their actions that they welcome originality and differences of opinion.

Noted researcher Deborah Rozman remarked in 1998 that “the neural information the heart sends to the brain can either facilitate or inhibit cortical function, affecting perception, emotional response, learning and decision making.” The heartbeat of another person is perceivable within three to four feet because of the electromagnetic field that it projects. The heartbeat of one person registers in the brain waves of another person. There are intuitive or gut feelings that are picked up by neurons throughout the body. “People need to know you care before they care what you know” has often been said. And old adages become just that because they are usually true.

In Choice Theory of Motivation, William Glasser (1990) cites five equally important needs:

- The need to survive and reproduce
- The need to belong and love
- The need to have some power
- The need to have freedom
- The need to have fun

This is also evident in Abraham Maslow’s well-known hierarchy of needs (Maslow, 1968), which includes the following in a hierarchy beginning with the most basic:

- Physiological needs: food, water, air, shelter
- Safety needs: security, freedom from fear, order
- Belongingness and love: friends, spouse, children
- Self-esteem: self-respect, achievement, reputation
- Self-actualization: to become what the individual has the potential to become

Human beings generally move up the hierarchy from basic to complex needs. As each need has been met, it becomes less of a motivator as the person focuses on the next level.
As we examine motivators we need to remember that basic needs have
to be met first for students. We recognize that all humans have a very
strong need to be liked and included. Classrooms everywhere must foster
an inclusionary climate. It is essential that students bond with one another
and with the teacher to form a positive learning community. Dr. Robert
Sapolsky (1998), Professor of Biological Sciences and Neuroscience at Stan-
ford University, states that we can minimize the impact of stress by build-
ing a supportive environment:

Put an infant primate through something unpleasant: it gets a
stress-response. Put it through the same stressor while in a room
full of other primates and . . . it depends. If those primates are
strangers, the stress-response gets worse. But if they are friends,
the stress-response is decreased. Social support networks—it helps
to have a shoulder to cry on, a hand to hold, an ear to listen to you,
someone to cradle you and to tell you it will be okay. (p. 215)

Some teachers, with their students, cooperatively develop classroom
“agreements” (Gibbs, 1995), or “Trust Statements” (Harmin, 1994), or
“rules to live by” to help students feel that they have a voice in the running
of the classroom. These rules also help students become more emotionally
intelligent and responsible learners. Students in small groups generate
statements that they believe the class should live by—for example, “Every-
one’s ideas count.” After the groups share their statements, the class com-
bines, deletes, or adds sentences until consensus is reached and students
feel comfortable and can support these rules to live by, which may include
the following:

♦ There is no wrong opinion.
♦ No put-downs or sarcasm here.
♦ Everyone must be heard.
♦ Mistakes are learning points.

If these statements are posted for all students to see and reflect on, stu-
dents will monitor and honor the rules that they have created.

We also recognize that learning communities foster links between
heart and mind. Driscoll (1994) asks us to consider that “community is the
entity in which individuals derive meaning. It is not so much character-
ized by shared space as it is by shared meanings. Community in this view
is not a mere artifact of people living (or working or studying) in the same
place, but is rather a rich source of ‘living tradition’” (p. 3).
EMOTIONS AND LEARNING

Students living in fear cannot learn. We know from the research on the phenomenon of “downshifting the psychophysiological response to threat associated with fatigue or perceived helplessness” (Caine & Caine, 1997, p. 18) that students will not attend to learning if their major concern is safety.

Safety in classrooms means intellectual safety as well as physical safety. During stress, the emotional centers of the brain take control of cognitive functioning and thus the rational thinking part of the brain is not as efficient, and this can cause learning to be impeded. If students are living daily with the threat of being ridiculed or bullied, they cannot give their full attention to learning. Students who are challenged beyond their skill level are more concerned about being embarrassed or laughed at than with the quest for learning. They will not be motivated to attempt the challenge if they aren’t able to imagine or perceive success.

In classrooms where the teacher does not adjust the learning to the level of readiness and teaches only to the “middle,” some students will be bored from lack of challenge and others may “downshift” from too great a challenge. Thus teachers need to consider where their learners are in relation to the learning goal and to plan learning experiences just beyond the skill level of each student.

All students are more likely to be engaged in the learning, rise to the challenge, and have a sense of self-confidence as they approach the task if they feel that they have a chance to succeed. Thus once the levels of readiness have been considered (although it is unrealistic to consider each learner individually), students can often be grouped and experiences designed to accommodate the learners at their level of understanding.

Teachers need to consider the degree of complexity of learning tasks so that they will be challenging but not overwhelming. This establishes the state of “flow” (Csikszentmihalyi, 1990), the condition that exists when learners are so engaged, excited about learning, challenged, and receiving appropriate feedback that they are oblivious to anything else. Students are at their most productive and most creative in this state:

People seem to concentrate best when the demands on them are a bit greater than usual, and they are able to give more than usual. If there is too little demand on them, people are bored. If there is too much for them to handle, they get anxious. Flow occurs in that delicate zone between boredom and anxiety. (Goleman, 1992, cited in Csikszentmihalyi, 1990, p. 4)

Renata Caine, a well-known pioneer in the field of brain-based education, proposes that there are three basic elements to brain/mind learning and teaching:
Emotional climate and relationship or relaxed alertness
Emotional climate and relationships are important to produce what Kohn (1993) refers to as “relaxed alertness”:

All the methodologies that are used to orchestrate the learning context influence the state of relaxed alertness. It is particularly important for educators to understand the effect of rewards and punishments on student states of mind. Research shows most applications of reward and punishment in the behavioral mode inhibit creativity, interfere with intrinsic motivation, and reduce the likelihood of meaningful learning. (cited in Caine & Caine, 1997, p. 123)

Rewards and punishments tend to lessen the chances of self-motivation and an appreciation of learning is its own reward. Five practical alternatives to using rewards are the following:
- Eliminating threat
- Creating a strongly positive climate
- Increasing feedback
- Setting goals
- Activating and engaging positive emotions (Jensen, 1998b, p. 68)

It is important, if not imperative, that students feel good, have success, have friends, and celebrate their learning:

Emotions affect student behavior because they create distinct, mind-body states. A state is a moment composed of a specific posture, breathing rate, and chemical balance in the body. The presence or absence of norepinephrine, vasopressin, testosterone, serotonin, progesterone, dopamine, and dozens of other chemicals dramatically alters your frame of mind and body. How important are states to us? They are all that we have; they are our feelings, desires, memories, and motivations. (Jensen, 1998b, p. 75)

The emotional environment interacts with instruction and influences how information is consolidated. If “downshifting” occurs, the high stress/threat response sabotages connections and thus learning cannot take place. At this point we are fortunate if even memorization of isolated
facts and programmed skills is possible. It is almost impossible for higher-order thinking to take place.

If students think that success isn’t possible because the task is too difficult or instructions for a task are ambiguous and not understood, they feel uncertain. These situations cause the learner to form a negative state, and the learner ceases to persevere. Alternately, classrooms that create “eustress” or a state of “flow” create a positive learning environment. Classrooms that embed choices in learning and routines that demonstrate mutual respect are supportive learning environments for students.

**EMOTIONAL INTELLIGENCE**

Emotional intelligence is a person’s ability to use his or her emotions intelligently. It involves maintaining a balance between reason and emotion. Daniel Goleman (1990) organizes emotional intelligence as a set of emotional competencies that occur in five domains:

**Self-Awareness**

Self-awareness is one’s ability to sense and name a feeling when it happens and also to put it into words. Self-aware people can use appropriate strategies to deal with their moods by sharing frustrations with others or seeking support on a bad day. Teachers should encourage students to articulate their feelings and seek and give support. Self-awareness is also being in touch with feelings, not letting feelings become engulfing, and having strategies to cope with moods. In her book *Molecules of Emotion*, Candace B. Pert (1998) suggests, “Feeling low and sluggish? Take a walk. Feeling anxious and jittery? Run!” (p. 293) We all need to find ways to change and manage our moods once we recognize what they are.

**Managing Emotions**

Managing emotions is an outcome of recognizing and labeling feelings. It is the ability to calm and soothe during anxious moments or to manage and deal with anger. Using “teachable moments” (when an inappropriate emotional response has been given), teachers can help students learn problem-solving skills to generate appropriate alternatives to the feelings. Conflict resolution is easier if students have a repertoire of strategies for dealing with conflict when it erupts.

**Self-Motivation**

Self-motivation consists of competencies such as persistence, setting one’s own goals, and delaying gratification. Many students give up very easily when difficulties occur. Students need to feel hopeful even in the face of setback. The state of “flow” is an integral component of this
domain. If students and teachers can create that state of high challenge and low threat, more learning can take place.

**Empathy**

Empathy is being able to feel for another. Teachers can ask students to “stand in the other person’s shoes.” These people may be classmates in a situation that calls for empathy. They may be characters in fiction or history with whom students can empathize to understand their emotions. This allows the students to feel how the character or individual might have felt. Understanding another’s point of view or perspective is often a standard targeted in many districts. Feeling for others builds tolerance and understanding.

**Social Skills**

Social skills are the competencies that one uses to “read” other people and manage emotional interactions. People with high levels of social competencies have the ability to handle relationships well and are able to adapt to a variety of social situations. They are said to have “social polish.” Teachers modeling these competencies and labeling them when seen in the classroom show the value of emotional intelligence in personal interactions.

**INSTRUCTIONAL TECHNIQUE: QUESTIONING**

Downshifting can occur during teacher-student question and answer sessions. Fear of ridicule occurs when students are challenged by questions that are beyond their level of understanding or comprehension. The notion of “wait time” (Rowe, 1988) gives students time to access information stored in long-term memory. We know this takes at least 3 to 5 seconds. The quality or quantity of the answer is often increased by the amount of time given in order to access the information and formulate an answer. Generally the longer the “think time,” the better the answer.

“Think, Pair, Share” (Lyman & McTighe, 1988) is an obvious technique to use to facilitate wait time. Asking students to think by themselves, pair with another student, and share their ideas naturally gives students time to think, access information, and formulate better answers. This also decreases the chances of downshifting and increases the chances of the students actually thinking about and attending to the question that has been posed. It encourages all students to share thinking, not just the person called on to answer. As the teacher comes to know the learners better
and to recognize their levels of readiness, questions can be differentiated by level of complexity. This challenges learners at or just beyond their levels of comprehension or experience.

Often, teachers ask questions or pose problems at different levels of Bloom’s thinking taxonomy (Bloom et al., 1956), for example,

- Level I, Knowledge-Recall: What is the story about?
- Level II, Comprehension-Understanding: Why did this happen?
- Level III, Application-Transfer: Use the information to predict . . .
- Level IV, Analysis-Examining: How many elements are present?
- Level V, Synthesis-Combining: Change the story to a new setting.
- Level VI, Evaluation-Rating: Rank all the solutions in priority order.

Figure 1.1 suggests stems that may be used at each level of Bloom’s taxonomy. Teachers may differentiate questions based on students’ readiness and level of comprehension. The figure also provides suggestions for tasks at different levels of the taxonomy.

**INSTRUCTIONAL TECHNIQUE: CUBING**

Cubing is another technique that can help students think at different levels of the taxonomy (Cowan & Cowan, 1980). Cubing is a technique for considering a subject from six points of view (Cowan & Cowan, 1980; Tomlinson, 2001). Cubing works well when we are “stuck” or locked into a particular way of thinking.

One side of the cube may say: Describe it
Another side: Compare it
The third side: Associate it
The fourth side: Analyze it
The fifth side: Apply it
And the sixth side says: Argue for or against it

Cubes may vary with tasks or commands that are appropriate to the level of readiness of the group. Cubes may also be constructed with tasks in a particular area of the multiple intelligences such as verbal/linguistic, bodily/kinesthetic, or intrapersonal intelligence.
### QUESTION STARTERS

#### Level I: KNOWLEDGE (Recall)
1. What is the definition for . . . ?
2. What happened after . . . ?
3. Recall the facts.
4. What were the characteristics of . . . ?
5. Which is true or false?
6. How many . . . ?
7. Who was the . . . ?
8. Tell in your own words.

#### Level II: COMPREHENSION
1. Why are these ideas similar?
2. In your own words retell the story of . . .
3. What do you think could happen?
4. How are these ideas different?
5. Explain what happened after.
6. What are some examples?
7. Can you provide a definition of . . . ?
8. Who was the key character?

#### Level III: APPLICATION (applying without understanding is not effective)
1. What is another instance of . . . ?
2. Demonstrate the way to . . .
3. Which one is most like . . . ?
4. What questions would you ask?
5. Which factors would you change?
6. Could this have happened in . . . ? Why or why not?
7. How would you organize these ideas?

### POTENTIAL ACTIVITIES

#### Level I:
1. Describe the . . .
2. Make a time line of events
3. Make a facts chart
4. Write a list of . . . steps in . . . facts about . . .
5. List all the people in the story.
6. Make a chart showing . . .
7. Make an acrostic
8. Recite a poem.

#### Level II:
1. Cut out or draw pictures to show an event.
2. Illustrate what you think the main idea was.
3. Make a cartoon strip showing the sequence of . . .
4. Write and perform a play based on the . . .
5. Compare this _______ with_________
6. Construct a model of . . .
7. Write a news report.
8. Prepare a flow chart to show the sequence . . .

#### Level III:
1. Construct a model to demonstrate using it.
2. Make a display to illustrate one event.
3. Make a collection about . . .
4. Design a relief map to include relevant information about an event.
5. Scan a collection of photographs to illustrate a particular aspect of the study.
6. Create a mural to depict . . .

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## QUESTION STARTERS

### Level IV: ANALYSIS
1. What are the component parts of . . . ?
2. What steps are important in the process of . . . ?
3. If . . . then . . .
4. What other conclusions can you reach about . . . that have not been mentioned?
5. The difference between the fact and the hypothesis is . . .
6. The solution would be to . . .
7. What is the relationship between . . . and . . . ?

### Level V: SYNTHESIS
1. Can you design a . . . ?
2. Why not compose a song about . . . ?
3. Why don’t you devise your own way to . . . ?
4. Can you create new and unusual uses for . . . ?
5. Can you develop a proposal for . . . ?
6. How would you deal with . . . ?
7. Invent a scheme that would . . .

### Level VI: EVALUATION
1. In your opinion . . .
2. Appraise the chances for . . .
3. Grade or rank the . . .
4. What do you think should be the outcome?
5. What solution do you favor and why?
6. Which systems are best? Worst?
7. Rate the relative value of these ideas to . . .
8. Which is the better bargain?

## POTENTIAL ACTIVITIES

### Level IV: ANALYSIS
1. Design a questionnaire about . . .
2. Conduct an investigation to produce . . .
3. Make a flow chart to show . . .
4. Construct a graph to show . . .
5. Put on a play about . . .
6. Review . . . in terms of identified criteria.
7. Prepare a report about the area of study.

### Level V: SYNTHESIS
1. Prepare a list of criteria you would use to judge a . . . Indicate priority ratings you would give.
2. Devise an original plan or experiment for . . .
3. Finish the incomplete . . .
4. Make a hypothesis about . . .
5. Change . . . so that it will . . .
6. Propose a method to . . .
7. Prescribe a way to . . .

### Level VI: EVALUATION
1. Prepare a list of criteria you would use to judge a . . . Indicate priority ratings you would give.
2. Conduct a debate about an issue.
3. Prepare an annotated bibliography . . .
4. Form a discussion panel on the topic of . . .
5. Prepare a case to present your opinions about . . .
Why Do We Use Cubes?

Cubing, with its many sides, allows students to look at an issue or topic from a variety of angles and to develop a multidimensional perspective rather than a single one.

Cubes offer a chance to differentiate learning by readiness (familiarity with content or level of skill), student interest, and/or learning profile (multiple intelligences). Cubes may vary in color and tasks depending on the abilities and interest of the small group. They add an element of novelty and fun to the learning by providing uniqueness to the lesson. It is a great strategy for tactile/kinesthetic learners as they reinforce understanding and extend or demonstrate learning.

How Do We Use Cubes?

1. Keep clear learning goals in mind when considering the use of cubing for different learners.

2. Provide extended opportunities, materials, and learning situations that are appropriate for a wide range of readiness, interests, and learning styles.

3. Make sure students understand the verbs and directions for the tasks.

4. Group students according to readiness, with different colored cubes giving tasks or questions appropriate to their level of understanding and ability level in that particular topic or skill. Students assist one another in their learning.

5. Ask students to share findings with the large group or to form base groups of experts to share their tasks.

Figure 1.2 suggests verbs that may be used on all six sides of a cube. Cubing may also be differentiated using multiple intelligences. Cubes may be designed with a variety of multiple intelligence activities to give students a chance to use their varied strengths. As an alternative, teachers can also use a die with numbers 1 to 6 and provide students with activity cards at various levels of complexity related to the topic (Figure 1.3).

If students are studying the planets, for example, they might have a variety of cubes in the different multiple intelligences to process information for musical rhythmic intelligence, bodily kinesthetic intelligence, visual spatial intelligence, naturalist, logical mathematical, interpersonal, or intrapersonal intelligences. Or in a class where students are reading *Charlotte’s Web* by E. B. White, cubes could be used to deal with visual spa-
Figure 1.2. Use Of Different Verbs, Tasks, and Commands on Each Side of a Cube

<table>
<thead>
<tr>
<th>Cubing . . . Levels of Thinking</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Tell</strong></td>
<td><strong>4. Review</strong></td>
</tr>
<tr>
<td>Describe</td>
<td>Discuss</td>
</tr>
<tr>
<td>Recall</td>
<td>Prepare</td>
</tr>
<tr>
<td>Name</td>
<td>Diagram</td>
</tr>
<tr>
<td>Locate</td>
<td>Cartoon</td>
</tr>
<tr>
<td>List</td>
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<tr>
<td><strong>2. Compare</strong></td>
<td><strong>5. Propose</strong></td>
</tr>
<tr>
<td>Contrast</td>
<td>Suggest</td>
</tr>
<tr>
<td>Example</td>
<td>Finish</td>
</tr>
<tr>
<td>Explain</td>
<td>Prescribe</td>
</tr>
<tr>
<td>Define</td>
<td>Devise</td>
</tr>
<tr>
<td>Write</td>
<td></td>
</tr>
<tr>
<td><strong>3. Connect</strong></td>
<td><strong>6. Debate</strong></td>
</tr>
<tr>
<td>Make</td>
<td>Formulate</td>
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<tr>
<td>Design</td>
<td>Choose</td>
</tr>
<tr>
<td>Produce</td>
<td>Support</td>
</tr>
<tr>
<td>Develop</td>
<td>In your opinion . . .</td>
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</table>

tial intelligence, and students could be given the following statements on the sides of their cubes:

*Green Cube*

1. Draw Charlotte as you think she looks.
2. Use a Venn diagram and compare Charlotte and Fern.
3. Use a comic strip to tell what happened in this chapter.
4. Shut your eyes and describe the barn. Jot down your ideas.
5. Predict what will happen in the next chapter. Use symbols.
6. In your opinion, why is Charlotte a good friend?
### Figure 1.3. Cubes Vary in Color and Tasks Depending on the Abilities and Interests of the Learners

<table>
<thead>
<tr>
<th>Green Cube</th>
<th>Blue Cube</th>
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<tbody>
<tr>
<td>1.</td>
<td>1.</td>
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<td>2.</td>
<td>2.</td>
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<tr>
<td>3.</td>
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<td>4.</td>
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<td>5.</td>
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<tr>
<td>6.</td>
<td>6.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Yellow Cube</th>
<th>Red Cube</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1.</td>
</tr>
<tr>
<td>2.</td>
<td>2.</td>
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<tr>
<td>3.</td>
<td>3.</td>
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<td>4.</td>
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<td>5.</td>
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<tr>
<td>6.</td>
<td>6.</td>
</tr>
</tbody>
</table>
Yellow Cube

1. Use a graphics program on the computer and create a character web for Wilbur.
2. Use symbols on a Venn diagram to compare Wilbur and Charlotte.
3. Use a storyboard to show the progress of the plot to this point.
4. Draw the farm and label the items, people, and buildings.
5. What is the message that you think the writer wants people to remember? Draw a symbol that illustrates your idea.
6. When you think of the title, do you agree or disagree that it is a good choice? Why or why not?

Both cubes are tapping into using visual spatial intelligence, with the green cube working at a more basic level with key aspects of the story and the yellow cube stretching student thinking more in the abstraction, extending ideas and making connections.

CLASSROOM CLIMATE

Physical and Emotional Atmosphere

The climate is influenced by the physical attributes of the classroom. Things such as appropriate lighting, cleanliness, orderliness, and displays of students’ work contribute to that positive atmosphere. Plentiful and appropriate resources are necessary to facilitate student success. There could be computers and materials that allow for hands-on manipulation. There should be opportunities for social interaction and intellectual growth.

Enriched environments are created not only by materials but also by the complexity and variety of tasks and challenges and feedback (Caine & Caine, 1997; Jensen, 1998b). Engaging materials and activities help to develop dendritic growth, the neural connections that are facilitated by experiences and stimulation (Diamond & Hopson, 1998; Green, Greenough, & Schlumpf, 1983; Healy, 1992). Dr. Arnold B. Scheibel, Professor of Neurology at UCLA, suggests that

on the basis of what we know and have seen from animal experiments, it seems a likely inference that the same phenomenon in rats, mice, cats, and monkeys holds for humans, as well: Increase the level of environmental stimulation and challenge, and you will increase the branching of the dendrites and the thickness of the human cortex. (Diamond & Hopson, 1998, p. 35)
This growth is stimulated by a variety of complex and intriguing activities, as previously noted by Renata Caine. “If we encourage children to make choices from a selected variety of available challenges, both environmental and intellectual, we are no doubt following the wisest course” (Healy, 1992, p. 72).

**Use of Music**

Another component for enhancing classroom climate may be the inclusion of music. Researchers at Strathclyde University have discovered that brainpower soars when students listen to stimulating pop tunes and advise that playing the latest hits in classrooms may actually increase student achievement.

This study by Dr. Brian Boyd and Katrina Bowes (Dana: The Brain in the News, 2001) researched the effects of music after learning about studies in Russia that discovered that medical patients who listened to music recovered faster. In contrast to the belief that that only classical music calms the learner, they found that modern music with the same tempo as classical (60 beats per minute) has the same effect and makes the mind more receptive to learning. This music can actually help the brain retain information.

Many teachers who have tried using pop music report higher levels of concentration by their students. Pop music triggers the autonomic nervous system, and we respond by feeling good and tapping our feet to the music. The pupils of the eyes dilate, and endorphin levels and energy rise. Teachers often say that students will learn more in a class if they are enjoying the experience, and music can set the stage for learning. Students will link a known routine with a piece of music and thus be ready for what is to follow. The music can be playful, for example playing Marvin Gaye’s “I Heard It Through the Grapevine” while students are estimating the number of raisins in a small lunch-size box. Or the music can appeal to the emotions and create a mood such as happens when listening to “When Johnny Comes Marching Home Again” at the beginning of a discussion of World War I or “War” by Bruce Springsteen in relation to the study of the Vietnam War.

Music energizes people and masks “dead air” when there is a “dip” in the energy level of students. Mozart’s music or other Baroque music can soothe and calm as well (Campbell, 1998).

**Laughter**

Laughter is another tool to use in classrooms. It punctuates learning by releasing neurochemical transmitters called endorphins, and it is said to be
the shortest distance between two people. Laughter even helps the immune system to increase the number of type T leukocytes (T cells) in the blood. T cells combat damage and infection, and some researchers have even dubbed them “happiness cells” (Silvia H. Cardoso, Ph.D., in Dana publication *Cerebrum*, 2000). It makes sense to include humor and laughter and to celebrate learning in the classroom. Teachers can encourage students to applaud one another and cheer for each other’s successes. Using energizing cheers (Burke, 1994; DePorter, 1998), students give rounds of applause, high fives, and other cheers that students can often create for themselves. These cheers also include actions to supplement the aural responses. Kinesthetic actions help energize by sending more oxygen and glucose to the brain and often result in fun and laughter to raise endorphins.

Even though each learner in the classroom may appear very different on the surface, each needs to feel safe and comfortable. So in classrooms climate and atmosphere play an important part in the learning process. Anything teachers can do to create a risk-free supportive environment where students can feel safe and where they can thrive needs to be considered and implemented in classrooms. Building a community of learners who care for and support one another is essential in a differentiated classroom. Students who know and respect each other are more tolerant of differences and more comfortable when tasks are different. Even though “one size doesn’t fit all,” learners require all these conditions to succeed.