

Chapter 1

REACHING ALL STUDENTS THROUGH DIFFERENTIATED INSTRUCTION

Educators have heard a lot over the past few years about “differentiating instruction” as well as “brain-based” teaching strategies. This chapter explores what these terms mean and the importance of such instructional efforts by teachers in order to reach and teach all students in an inclusive classroom. In this chapter, we begin with an explanation of differentiated instruction and how to go about it in our classrooms, and we address some of the components under the umbrella of differentiated instruction and brain-based teaching strategies, such as multisensory instruction and cooperative learning. Chapter Two addresses other components of differentiated instruction, such as teaching through students’ learning styles and multiple intelligences.

DEFINITIONS, DESCRIPTIONS, AND KEY COMPONENTS

To address the learning differences in all students and maximize their levels of performance and achievement, teachers need to differentiate instruction in the classroom. Differentiated instruction is a way of thinking about teaching and learning that recognizes the fact that one size does not fit all learners. Some students are not successful in school because there is a misfit between how they learn and the way they are taught (Association for Supervision and Curriculum Development, 2002). This concept or awareness certainly is not new for teachers, particularly special educators. But the term *differentiated instruction* is relatively new, and so is the recognition in the general education community that teaching must change in order to fulfill our responsibility to reach and teach all of the diverse learners in our classrooms.

Carol Ann Tomlinson, associate professor at the University of Virginia, Charlottesville, is one of the key educational leaders who speaks and writes extensively about the subject. According to Tomlinson (2001), differentiated instruction is:

- *Proactive.* Teachers plan a variety of ways to get at and express learning and that are planned to be robust enough to address the range of learner needs.
- *More qualitative than quantitative.* Teachers adjust the nature, not necessarily the length or quantity, of the assignment.

- *Student centered.* Learning experiences are engaging, relevant, and interesting.
- *Rooted in assessment.* Throughout the unit of study, teachers assess students' developing readiness levels, interests, and modes of learning in a variety of ways—and adjust instruction accordingly.

For struggling learners, differentiated instruction means setting important goals of understanding and then figuring out how to build scaffolding leading to success in those goals, not diluting the goals. *Scaffolds* are supports needed for a student to succeed in challenging work, defined as assignments or tasks that are slightly beyond the student's comfort zone, not overwhelming and frustrating assignments (Tomlinson, 2001). Scaffolds may include more modeling and structure, guided instruction and practice opportunities, reteaching, provision of study guides, graphic organizers, and other learning tools. They also include the numerous strategies and accommodations throughout this book that help make learning more accessible to students.

Some students need more time and opportunity to learn the basic content and material through various means, and with additional explanation, review, and practice. Other students need less time on the core content and opportunities for extended, advanced learning. Adjusting time and degree of support provided are components of differentiated instruction.

Heacox (2002) further defines differentiated instruction as:

- Changing the pace, level, or kind of instruction provided in response to individual learners' needs, styles, or interests
- Rigorous: Providing challenging instruction to motivate students to push themselves and base learning goals on a student's unique capabilities
- Relevant: Focused on essential learning, not on "side trips" or "fluff"
- Flexible and varied
- Complex: Challenging students' thinking and actively engaging them in content that conveys depth and breadth [p. 5]

Differentiation is based on the beliefs that (Tomlinson, 2000):

- Students who are the same age differ in their readiness to learn, interests, styles of learning, experiences, learning profiles, life circumstances, and levels of independence.
- The differences in students are significant enough to make a major impact on what students need to learn, the pace at which they need to learn it, and the support they need from teachers and others to learn it well.
- Students will learn best when supportive adults push them slightly beyond where they can work without assistance.
- Students will learn best when they can make a connection between the curriculum and their interests and life experiences.

"Curriculum," Tomlinson (2000) writes, "tells us *what* to teach. Differentiation tells us *how* to teach the same standard to a range of learners by employing a variety of teaching and learning modes" (p. 6).

HOW, WHAT, AND THROUGH WHICH MEANS DO WE DIFFERENTIATE?

There are numerous ways to differentiate instruction, and they are illustrated throughout this book—for example:

- Materials, tasks, and learning options at varied levels of difficulty
- Multiple and flexible groupings of students

- Multisensory instruction
- Lessons, assessments, and projects that take into account students' varied learning styles and preferences, interests, talents, and multiple intelligences
- Varying degrees of supports and scaffolds
- Choices of where, how, and with whom students may work
- Choices about topics of study, ways of learning, and modes of expression
- Assignments, projects, and student products that draw on students' individual strengths and interests
- Adaptations, modifications, and multiple approaches to instruction
- A variety of assessments (for example, portfolios, written and oral exams, learning logs, and demonstrations)
- Tiered assignments, which vary the level of complexity or challenge, the process or product

We can differentiate content, presentation and instructional strategies, activities, performance tasks, and assessment tools (Chapman, 2000). Differentiated instruction typically involves multiple approaches and adaptations in the areas of content (what students learn), process (the ways students learn and how the content is taught), and product (how students present or demonstrate their learning).

Content can be differentiated by complexity based on readiness level. For example, if a writing lesson is focused on dialogue, one student might be ready to create a single dialogue exchange between two characters, and another may be ready to write four to five exchanges (Pettig, 2000). As Pettig describes, students in a math class might be working problems of varying complexity based on their readiness or skill level. For example, the class may be studying long division, but students who are more advanced may be solving problems with two- and three-digit divisors, while others are solving problems with single-digit divisors.

When teachers differentiate by readiness level, they can do so through varied texts or supplementary materials by reading level, varied scaffolding, tiered tasks or products, small group instruction, homework options, and negotiated criteria for quality (Tomlinson, 2001)

It is important for teachers to preassess prior knowledge—what students already know and can do (for example, through performance tasks, surveys, and interviews—in order to be able to challenge all students at their appropriate readiness level. In addition, teachers should be assessing students' interests related to the topic (Chapman, 2000).

Differentiating the process will include the wide array of strategies for engaging students' attention and active participation, and questioning strategies that incorporate the full range of Bloom's Taxonomy (knowledge, comprehension, application, analysis, synthesis, and evaluation) levels of questions (see Chapter Seven). It also involves designing lessons and activities that tap into students' strengths, interests, and multiple intelligences, as well as their learning style preferences (see Chapter Two and the numerous activities through this book).

Flexible grouping is another aspect of process differentiation. The teacher structures an array of grouping opportunities best suited for the activities: whole class, teams, cooperative groups, partners, or independent; by interest, preferred learning modality, or readiness level; heterogeneously, homogeneously, teacher assigned, or self-assigned. Grouping formats for varying purposes may involve:

- The whole class (for preassessment, introduction of concepts, planning, sharing, and wrap-up of explorations)
- Small groups (pairs, triads, quads) for sense making, teaching skills, directed reading, planning, and investigation
- Individualized for practice and application of skills, homework, interest centers, products, independent study, and testing (Tomlinson, 2001)

Chapter Two discusses the diversity in individual learning preferences (for example, modality preferences, environmental preferences, cognitive style preferences) and students' multiple intelligences.

Differentiating the process can also be accomplished by tapping into students' diverse learning styles, strengths, and interests and incorporating a variety of options in how students are able to access the curriculum. Teachers need to present information through multiple modes and provide students with choices in how they learn the curriculum. There are countless ways of doing so—for example:

- Interest or instructional learning centers or stations
- Projects (individual, partner, or group)
- Technology
- Choices of or built within activities
- Tiered assignments
- Books on tape

Another key aspect of differentiating instruction is differentiating the output or the product—that is, how students demonstrate mastery of the content and their learning that has taken place. There are numerous ways to differentiate the product, including oral presentations, dramatic performances, demonstrations, designing a creative product, constructing or building something, and analyzing something. Chapter Two contains more on this topic, as do the activities throughout the book, which provide many examples of how to differentiate student products.

When differentiating the product, teachers encourage all students to draw on their personal interests and strengths. At the same time, they retain focus on the curricular components they deem essential to all learners (Tomlinson, 2001). Some teachers design project menus based on multiple intelligences. Others provide a project menu based on Bloom's Taxonomy (Heacox, 2002), which involve students in activities at various levels of cognitive domain.

Layered curriculum (Nunley, 2001) is an excellent source of practical ideas and ways to differentiate instruction based on a three-layered triangular-shaped learning model. Each layer represents a different depth of study of a topic or unit of learning, and students can choose how deep they wish to examine a topic, thereby choosing their own grade as well. The bottom layer, which is the largest, covers general content designed around meeting the district and state's core curriculum and standards. The middle layer is smaller and asks students to apply concepts learned in the bottom layer. The top layer is the smallest and requires a higher critical thinking assignment (Nunley, 2001).

According to Nunley, to earn, for example, a C in a biology class, students must select from a unit menu of learning activities for that topic of study. This section may offer a choice of fifteen activities, each worth approximately 10 to 15 points. Students can select from those choices and earn up to a maximum of 65 points through performance of activities at the C level. To be able to earn a B, students must also perform a lab. Students may choose one lab from a choice of three or four lab activities for 15 points. In order to earn an A, students must also do one A-level activity. A few A-level choices are provided, each worth 20 points. In this example, a student may earn a grade of D (40–55 points), C (56–70 points), B (71–85 points), or A (86 or more points). The author and creator of this model, Kathie Nunley, provides a wealth of strategies and guidance in layering curriculum in any subject or grade level to address the diverse range of learners in any classroom. We highly recommend visiting her Web site (www.Help4Teachers.com).

THE CHALLENGE OF DIFFERENTIATING INSTRUCTION

Teachers face enormous pressure to raise achievement and test scores, and for all students—the full range of diverse learners in classrooms—to somehow manage to meet or exceed grade-level standards. There is no question that this is a daunting task and expectation. Examining our teaching practices and making an effort to incorporate the components of differentiated instruction is one of the best means to achieve this goal. We can manage to tailor instruction to effectively reach and teach all of our students. However, teachers will be overwhelmed and discouraged if they try to do all of this at once in all areas

of the curriculum. This is a process, and there is a learning curve in gaining the competence and comfort level at differentiating curriculum and instruction. We recommend starting by integrating some of these methods and techniques into instruction, and to do so in stages. Experiment with some units of study, and incorporate more and more strategies as you feel ready to do so.

MULTISENSORY INSTRUCTION

We must make every effort to teach the curriculum through multimodal approaches. Multisensory instruction is necessary to reach the diverse learners in classrooms. It involves incorporating a combination of auditory, visual, tactile, and kinesthetic strategies in teaching methods and in the ways students can learn the content.

For most of us, the five primary senses do not all contribute equally to our learning. Each of us has sensory preferences, that is, we favor one or two senses over the others when gathering information to deal with a complex learning situation. We can still process with the other senses, but most of us rely more on our preferences when we face a complex task (Sousa, 2001a).

Studies of sensory preferences in U.S. school children in grades 3 to 12 in the mid-1990s showed that nearly half (46 percent) have a visual preference, over one-third (35 percent) have a tactile-kinesthetic preference, and just under one-fifth (19 percent) have an auditory preference (Sousa, 2001a; Swanson, 1995).

Sousa (2001b) notes that retention of information also depends on the type of teaching method used. Studies in the 1960s by the National Training Laboratories of Bethel, Maine (now the NTL Institute of Alexandria, Virginia), provided these interesting statistics with regard to how well people on average recall material twenty-four hours after being taught through the following teaching methods:

Lecture	5 percent
Reading	10 percent
Audiovisual	20 percent
Demonstration	30 percent
Discussion group	50 percent
Practice by doing	75 percent
Teach others/immediate use of learning	90 percent

The obvious implications are that we need to present lessons using a combination of methods. Students need hands-on experience. They also need the opportunity to verbalize their understanding frequently during the school day. Cooperative learning situations with partners, triads, or groups of four are very effective for getting students to discuss their learning—to verbalize, share, and teach each other.

Students who have the opportunity to work together and discuss ideas with peers and are actively and physically involved and participating in the lesson will have the most success in learning and retaining the information taught to them. The activities and strategies throughout this book incorporate these learning principles.

THE ADVANTAGES OF COOPERATIVE LEARNING

The crux of differentiated instruction requires that teachers employ methods and strategies that enable all students, with their diverse learning abilities and differences, to be able to master the curriculum and content and performance standards. This is achieved through instruction, assessment, and learning activities that are meaningful and engaging. Cooperative learning is one of the best means of doing this, with decades of research that validates its efficacy. All teachers should be trained in best practices for implementing cooperative learning in the classroom. Teachers may mistakenly believe they are using

cooperative learning when they simply have students working together in groups. This is not cooperative learning. In fact, students, particularly those with attention deficit hyperactivity disorder (AD/HD), often have difficulty learning and functioning productively in unstructured group work. Cooperative learning encompasses a high degree of careful planning and structuring and is an excellent vehicle for students to learn, including those with AD/HD. When students are taught how to work as a team and given the opportunity to learn and produce cooperatively with peers supporting one another in their learning, all can make significant academic and social gains (Rief, 2005).

Roger T. Johnson and David W. Johnson—researchers, professors, and codirectors of the Cooperative Learning Center at the University of Minnesota, Minneapolis—are national authorities and leaders on cooperative learning. They explain that all learning situations can be structured so that students either compete with each other (“I swim, you sink; I sink, you swim”), ignore each other and work independently (“We are each in this alone”), or work cooperatively (“We sink or swim together”). There is a positive correlation among goal attainment when they work cooperatively. Individuals in the group work together to achieve shared goals and maximize their own and each other’s learning. Cooperative learning is supported by a vast amount of research as the most beneficial structure in the classroom (Johnson, Johnson, & Holubec, 1998).

According to Johnson et al. (1998), there are five elements of cooperative learning:

1. *Positive interdependence.* This is the most important element: that group members perceive that they need each other to complete the task and cannot succeed unless everyone in the group is successful. Positive interdependence can be structured by establishing and including mutual goals, joint rewards, shared resources, and assigned roles.
2. *Individual accountability.* Each member of the group must be accountable for contributing his or her share of the work. There are various ways to provide for individual accountability, including giving each group member an individual exam, observing and recording the frequency of each member’s contribution, or randomly calling on one member to answer questions or present his or her group’s work to the teacher or the whole class.
3. *Face-to-face promotive interaction.* Several children (usually three or four) are grouped together and arranged facing each other (eye to eye, knee to knee). Team members promote each other’s productivity by helping, sharing, and encouraging each other’s efforts to produce and learn.
4. *Interpersonal and small group skills.* Students do not come to school with all the social skills they need to collaborate effectively. Teachers must teach teamwork skills as purposefully and precisely as they do academic skills.
5. *Group processing.* Group members need to discuss how well they are achieving their goals and maintaining effective working relationships. Give time and procedures for students to evaluate how well their group is functioning. For example, after each session, have groups answer: “What did we do well in working together today? What could we do even better tomorrow?” In addition, teachers monitor groups, providing feedback on how well the members are working together.

BRAIN-COMPATIBLE RESEARCH AND STRATEGIES

In the past decade or so, we have gained vast amounts of knowledge and understanding of the brain, its functioning, and how we learn. New technologies developed by neuroscientists have enabled researchers to study and verify what many educators always “knew” to be important factors in learning and retention of information taught: that students learn, understand, and remember best when they:

- Are actively engaged and participating in the learning experience
- Are taught through multisensory instruction
- Are interested

- Feel the material or lesson is relevant and meaningful
- Connect what they are learning that is new to what they already know
- See the pattern and connections
- Experience an emotional reaction (emotions are engaged)
- Feel safe and comfortable rather than stressed
- Have time and opportunity to grapple with problem-solving situations

Also, an abundance of research supports the importance of and need for music and physical activity in schools. We know the positive effects of different types of music and rhythm on learning, memory, and emotions. We also know that movement breaks and physical activity are important for students. They raise and lower the levels of various brain chemicals and consequently have impacts on our brain states, including energy levels, mood and emotions, and level of stress. Physical activity aids learning and memory.

According to Eric Jensen (2003), one of the leaders in brain-based learning strategies:

An average teacher may be reaching, at any given time, 50–70% of students. A great teacher may be reaching at any given time 50–70% of his or her students, but a different 50–70% each time! In other words, the great teacher uses a variety of activities and instructional methods to ensure that they reach different learners at different times. Over the course of a week or a month, the great teacher will eventually reach all the learners. The average teacher, however, will still be reaching the same learners over and over again. The average teacher, too, will lump learners by ability into a bell curve at grading time, convinced that the differences among learners are because of differences in effort or ability, not because of the teaching! [p. 22].

Much of what we will be sharing throughout this book addresses the various components of differentiated instruction and brain-compatible teaching and learning strategies. This will include the content in many of the chapters, as well as the student activities that are differentiated for diverse learners. Let us strive to be great teachers, managing to reach and teach all of our students.

HELPFUL WEB SITES

Following are two interesting Web sites for brain information:

- Dana Alliance for Brain Initiatives, www.dana.org.
The Dana Alliance is a nonprofit organization of more than two hundred preeminent scientists dedicated to advancing education about the progress and promise of brain research.
- Neuroscience for Kids, <http://faculty.washington.edu/chudler/neurok.html>.
This Web site has been created for students and teachers who would like to learn about the nervous system. It is a tremendous resource, with interesting information about the brain, experiments, links, and much more. This site was developed by Eric Chudler, a research associate professor in the Department of Anesthesiology at the University of Washington in Seattle, Washington.

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