

Data Driven Differentiation in the Standards-Based Classroom

Second Edition

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Introduction

Differentiating With Data for Student Growth and Achievement

WHAT IS OUR TARGET? ●

Today, the reality for teachers has shifted dramatically from a decade ago. No longer can we go into classrooms and “spray and pray,” hoping students will succeed. We are being held accountable for all learners, not only those who learn in spite of us but also those who learn because of us.

The 21st century learner differs immensely from learners even a generation ago. Today’s students look at typewriters, audiotapes, and rotary dial telephones as antiques that belong in a museum. They can’t imagine a world where communication and access to information isn’t achieved in a nanosecond with technology that should be commonplace to them. Thus, to use methods and techniques from the last century doesn’t connect to the reality of the learners’ world today. These students live in a cyber-tech environment, where pencil and paper often have little appeal and where novelty or relevance and meaning are a great need when it comes to ideas and information.

The world of learners demands new and different competencies if they are to succeed in the future. Thornburg (2002) reminds us that the world is in a constant state of flux. We continue to administer standardized tests with content that may be irrelevant in the world where students live. Beyond the test is the reality of the workplace and living a full and successful life in an ever-changing environment. Without a crystal ball, teachers go forth courageously, trying to prepare learners for a world whose shape is uncertain, a world that we may never see ourselves.

Partnership for 21st Century Skills (2008) has clearly defined the skills that are necessary for our students to develop in order to be successful in an unknown future society.

Three areas are outlined:

1. Life and career skills:
 - Flexibility and adaptability
 - Initiative and self-direction
 - Social and cross-cultural skills
 - Productivity and accountability
 - Leadership and responsibility
2. Learning and innovation skills:
 - Creativity and innovation
 - Critical thinking and problem solving
 - Communication and collaboration
3. Information, media, and technology skills:
 - Information literacy
 - Media literacy
 - Information and communications technology (ICT) literacy

Developing these skills should not be left to happenstance but crafted into the curriculum based on the Common Core State Standards with intention.

“According to Robert Reich (1992), the quality jobs of the future will belong to ‘symbolic analysts’—people who solve, identify, and broker problems by manipulating images” (Thornburg, 2002, p. 32). Reich’s basic skills include abstraction, system thinking, experimentation, and collaboration.

● CHALLENGES AND SHIFTS PRESENTED BY THE COMMON CORE STATE STANDARDS

Global competencies as well as the skills needed for 21st century learning have changed. To address this challenge, every state has a new set of standards for student demonstration of proficient learning and updated, high-stakes state assessments. All but a few states adopted the Common Core State Standards, including our territories. The other states, such as Texas, also adopted new more rigorous standards and assessments such as STAAR. This book is designed to help all districts and schools with these new challenges. While we highlight the Common Core State Standards, this book is designed to help all teachers use the data from their standards and standards-based assessments to differentiate for the wide variety of learners in our schools. Each district faces the challenge of

- more rigorous standards,
- use of complex text and digital resources,
- a strong focus on cross-content literacy,
- mathematics based on research practices and conceptual understanding as well as procedural fluency in real-world applications of complex mathematical ideas,

- a strong emphasis on citing evidence and source authenticity,
- the ability to communicate in-depth thinking in writing and other forms,
- the use of precise academic vocabulary in that communication, and
- deep analytic thinking skills in collaborative ways.

These shifts are used to create state assessments that require complex skill demonstration such as writing and researching digitally, constructing meaning mathematically, reading and interpreting online material from multiple sources, and using these skills to demonstrate student academic growth over time. Most students will need frequent rehearsal to not only demonstrate the standards but to demonstrate them online within the time parameters given. Not all students perform equally, so teachers will need to use these practice data to create opportunities for students to have the best possible success on a new generation of assessments.

WHY DIFFERENTIATE? ●

No longer is it an option to let students fall through the cracks. We recognize that they learn because of us and through the learning opportunities that we provide for the diverse learners that we have in classrooms today. As educators (and parents), we know that learners differ in many ways. Whether it is in appearance, learning style, multiple intelligence, prior experience, personal preference, or social/emotional development, students differ. Around the world, teachers are rising to the challenge of meeting the needs of those diverse learners while keeping the integrity of Common Core State Standards. We want not to lower the bar but, indeed, to raise the level of success and to increase growth for all students. Once the standards have been identified, we know that students like to receive and process new knowledge and skills in a variety of ways and will need many rehearsals to achieve mastery.

Thus, differentiating instruction to meet those diverse learners is a philosophy or mindset that teachers embrace, and there are ways to differentiate learning processes that are appropriate at different times in different situations with different learners. Students don't all learn the same thing on the same day in the same way. The dilemma for us as educators is to know the students well and to have a repertoire that can be used selectively and strategically based on the standards, the content, and the learners' needs. Knowing when, why, and how is the science of teaching. The art of teaching is the creativity that teachers use to include learners in the learning process based on their needs. The key to reaching targeted standards is planning for growth so that each learner may succeed to the best of his or her ability.

In this book, we explore ways of planning that consider

- Common Core State Standards;
- data about students and their knowledge, skills (pre-assessment, formative or ongoing, and summative), and ability to think diagnostically;

- information about students as individuals (learning styles, multiple intelligences, interests, preferences, and developmental [social, emotional, and physical] needs);
- unit planning (backward design); and
- lesson planning (chunking the learning to facilitate daily student engagement and rehearsal).

● THEATERS OF THE MIND: LEARNING SYSTEMS AND THE BRAIN

What do we know about learning and student growth? In recent years, we have learned a lot about how the brain is organized and how it functions, and what we have learned raises questions for us as teachers.

According to Ornstein (1986), the brain is a complex biological organ with several systems embedded in its structures:

Stuck side by side, inside the skin, inside the skull, are several special purpose, separate, and specific small minds. . . . The particular collection of talents, abilities, and capacities that each person possesses depends partly on birth and partly on experience. Our illusion is that each of us is somehow unified, with a single coherent purpose and action. . . . We are not a single person. We are many. . . . All of these general components of the mind can act independently of each other, [and] they may well have different priorities. (pp. 8–9)

These functions are not processed consciously but occur automatically.

Restak (1994) identifies five systems that interact constantly as we receive, process, and interpret information. It is like a multiplex theater that never closes, according to Given (2002), where several movies are playing at the same time. The five systems are as follows:

1. Emotional learning system
2. Social learning system
3. Physical learning system
4. Cognitive learning system
5. Reflective learning system (see Figure I.1)

The emotional, social, and physical systems are greedy for attention and will not allow the cognitive and reflective systems to function at optimal efficiency if their needs are not met.

Emotional Learning System

It has long been known that negative emotions and social interactions can inhibit academic progress (Rozman, 1998). Students will spend an

Figure I.1 Five Theaters of the Mind

Emotional	Social	Physical	Cognitive	Reflective
<ul style="list-style-type: none"> • Climate • Emotional safety • Relevancy • Meaning 	<ul style="list-style-type: none"> • Inclusion • Respect • Enjoys others • Interaction • Interpersonal • Sharing • Authentic situations • Tolerance 	<ul style="list-style-type: none"> • Requires active involvement • Enjoys challenging tasks that encourage practice • Skills are a major part of this system 	<ul style="list-style-type: none"> • Academic skill development • Prior and new learning connected • Seeks patterns, concepts, themes • Likes to see wholes and parts 	<ul style="list-style-type: none"> • Personal reflection on one's own learning styles • Reflects on successes, failures, and changes needed • Metacognition of one's own strengths and preferences

Source: Adapted from *Teaching to the Brain's Natural Learning Systems*, by B. Given, 2002, Alexandria, VA: ASCD.

inordinate amount of attention and energy protecting themselves from ridicule and rejection rather than learning new knowledge and skills.

Researchers tell us that we need emotional nourishment from birth (Kessler, 2000; Palmer, 1993). Lack of it affects us profoundly. Endorphins and norepinephrine (the feel-good neurotransmitters released in the brain during positive experiences) influence positive emotions and support learning along with good health and success in life (Pert, 1993). Emotions are both innate and acquired. Surprisingly, peers and siblings have much more impact on learned emotions (45 percent) than do parents (5 percent), according to Harris (1998).

When emotional needs such as love and acceptance are met, the brain produces serotonin (a feel-good neurotransmitter). When emotional needs are not met, young people often turn to drugs to obliterate the negative feelings of hunger, fatigue, and depression. A natural high can result through connectedness and meaningful interactions, interesting learning materials, and attention to students' personal needs and goals. Csikszentmihalyi (1990) refers to the "state of flow" where all systems are focused and challenge is matched to skill level. In this state, all systems are go and work together toward optimal learning.

The emotional system flourishes in classrooms and schools

- where educators and students believe students can learn and be successful,
- where students' hopes and dreams are recognized,
- where teachers make learning relevant to students' lives,
- where teachers provide multiple ways for students to express themselves,
- where teachers continue to challenge students, and
- where the climate nurtures rather than represses.

Social Learning System

From birth, we begin to form relationships with others and our environment to better understand ourselves. There are two social subsystems. One system in place at birth relates to dyadic relationships. The other evolves and deals with group relationships (Harris, 1998). The extent to which we feel part of a group influences our behavior in and out of school. All of us prefer to interact with those whose presence increases the brain's feel-good neurotransmitter brain levels, resulting from feelings of comfort, trust, respect, and affection (Panksepp, 1998). Yet, often in classrooms, there is no opportunity to develop social interactions that promote trust and connections. We naturally tend to participate in groups so that we feel a kinship that is fostered by group norms and values (Wright, 1994).

A skillful, insightful teacher can capitalize on this knowledge by creating a classroom climate that

- includes all learners,
- honors their hopes and aspirations, and
- provides an enriched environment for authentic learning (Given, 2002).

Physical Learning System

The physical learning system involves active problem-solving challenges. It is often the system that is not used enough in classrooms, even though we know that gifted students (Milgram, Dunn, & Price, 1993) and underachievers (Dunn, 1990) have a preference for active, tactile, and kinesthetic involvement when learning new material.

Those of us who have found learners in our classrooms who need to have the physical learning system in the forefront have realized that if we ignore this system, the learners will find a way to move to satisfy their needs regardless of our plans. Their movement might have nothing to do with the knowledge or skills that have been targeted for learning. So it begs the question: Do we build in opportunities for hands-on, active learning or do we let students find a way of their own to use physical systems, a way that may be counterproductive to the learning?

Cognitive Learning System

This is the system that we focus on most often in the classroom and rightly so as we want students to succeed in learning new knowledge and skills. The cognitive system deals with consciousness, language development, focused attention, and memory. This system also relies on the senses for processing information. Thus, good teachers facilitate learning by providing information in a novel way, stimulating the visual, auditory, and tactile senses as well as taste and smell, if appropriate. However, as previously noted, the emotional, social, and physical systems seem more greedy for attention, and if their needs are not attended to, students will not be comfortable enough to learn. If all systems are go, students tend to learn with more ease and with greater retention.

Reflective Learning System

Dr. Art Costa has been known to say that intelligent people “know what to do when they don’t know what to do.” People learn from experience only if they reflect on the experience.

This intelligence includes “thinking strategies, positive attitudes toward investing oneself in good thinking, and metacognition—awareness and management of one’s own mind” (Perkins, 1995, p. 234). Damasio (1999) notes that the reflective system involves the interdependence of memory systems, communication systems, reason, attention, emotion, social awareness, physical experiences, and sensory modalities.

The reflective system allows us to

- analyze situations,
- examine and react,
- make plans, and
- guide behaviors toward goals.

This is the system that, in the rush to cover the curriculum, is often left out of the learning process in the classroom. However, the skills of ongoing reflection and self-examination are key to evolving the self. These metacognitive skills enable students to form a clear image of self and to develop the reflective strategies that lead to self-directed learning and success in life.

LEARNING SYSTEMS AND STUDENT GROWTH

In each chapter of this book, we will look at the interaction of these learning systems and their impact on the learning process. We will acknowledge that every brain is unique and that how smart we are is not as important as how we are smart. Being cognizant of learning styles and preferences is another lens through which we know our learners and respond to their interests and needs. This knowledge is imperative for planning purposes and for identification of the hook each learner needs to become engaged with the learning.

We have also acquired research about instructional best practices that show great promise for student achievement. A decade ago, from research in the 1990’s *Classroom Instruction That Works*, Marzano, Pickering, and Pollack (2001) proposed nine essential strategies and provided a field book full of examples of these strategies in a variety of subject areas. These nine strategies have had a profound impact on student learning: as much as 22 to 45 percentile gains in student achievement. Figure I.2 shows the nine essential strategies and their percentile gains (Marzano et al., 2001).

In the previous edition, we suggested that if we were going to differentiate instruction for students, it probably would be best to include the best instructional strategies that we have available to us so that the chances of student learning and achievement are greater. In this book, we will endeavor to help teachers plan to use brain research as well as the pedagogical best practices to increase student engagement and learning with a diverse population.