

Differentiating Instruction With Style

**Aligning Teacher and Learner Intelligences for
Maximum Achievement**

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<i>Brain research and educational research tell us that people learn in many different ways and styles. This chapter provides a brief overview of the scope of available theories of intelligences and thinking styles. You don't need to know every detail of every theory, but you can use an understanding of learning styles theory to explore the diversity that each learner brings to the classroom.</i>	
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<i>The natural process of learning involves emotional, social, physical, cognitive, and reflective learning systems. Teachers can use an understanding of these learning systems, of common brain principles, and of how the left and right brain hemispheres interact to create safe, friendly, and challenging classrooms; to plan brain-compatible lessons; and to select teaching strategies that engage both hemispheres of the brain.</i>	
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<i>Understanding how people prefer to learn involves surveying them, listening to them, observing them, and understanding how their preferences for visual, auditory, or kinesthetic modes affect their learning. Important theories about learning preferences and learning styles have been offered to us by researchers in psychology and education, including Carl Jung, Anthony Gregorc, David Kolb, Bernice McCarthy, Don Lowry, Richard Strong, Harvey Silver, and J. R. Hanson. To synthesise their many theories into four primary learning styles, we will meet beach ball learners, puppy learners, microscope learners, and clipboard learners, introducing principles for differentiated lesson planning and instruction that work for all.</i>	

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<i>What is intelligence and what role does intelligence play in growth? This chapter explores several important theories about intelligence: Art Costa's 12 intelligent behaviors, Howard Gardner's 8 multiple intelligences, Robert Sternberg's triarchic model of intelligence, and Daniel Goleman's 5 domains of emotional intelligence. We will also look at how those theories of intelligence correlate with natural learning systems, learning styles, and research-based instructional practices. You will find a large variety of tools here: surveys and checklists to assess learners' multiple intelligences; brainstorming tools for instructional planning across content areas, learning styles, and intelligences; and choice boards for differentiated instruction.</i>	
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<i>Thinking skills can be taught, and this chapter offers a generous collection of models, tools, templates, systems, and samples to show you how. Topics include frequently asked questions about teaching thinking, metacognition, and the essential thinking skills needed for success in the 21st-century workplace. Also covered are the essential taxonomies: Bloom's taxonomy of critical thinking, Quellmalz's thinking taxonomy, Krathwohl's affective taxonomy, Williams's creative taxonomy, and Eberle's SCAMPER method. Along with the taxonomies are instructional tools, including cubing, choice boards, quality questioning, graphic organisers, brainstorming tools, reflection tools, and feedback tools.</i>	
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<i>How can teachers cope with the complexity of research and available models concerning learning preferences, learning styles, multiple intelligences, best practice, and thinking skills? The reality is that we cannot use every strategy for every student, but we can use differentiated strategies to provide variety for our students, and we can use teacher reflection to examine our plans to see if we are attending to the diversity in our classrooms while also focusing on the standards. This chapter offers a step-by-step planning template for differentiated lessons and a sample lesson for critiquing. Also offered are reflection tools to guide teachers in planning instruction that is brain compatible, taps a variety of multiple intelligences, offers satisfying learning activities for all learning styles, and builds in thinking skills at all levels of the taxonomies.</i>	
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Introduction

DIFFERENTIATING INSTRUCTION WITH STYLE

Like many other educators of my vintage, I have seen many things come and go—mandates and policies, theories and innovations that were “flavour of the month” one semester and replaced the next. The last 20 years have been an accelerated learning curve for most educators, filled with information about the brain, research on instructional strategies, intentional planning with standards or outcomes and schoolwide collaboration that focuses on student learning and problem solving. We are beginning to move from the “one size fits all” model to recognising that our schools and classrooms are full of diverse learners who have different backgrounds from “nature and nurture.”

Thus it is so important for teachers to get to know those learners, tap into their strengths, and respond with differentiated activities and experiences that will intrigue and engage them. But to differentiate instruction, we first have to know the learners. Instrumental in knowing the learners is becoming knowledgeable about learning styles, the different ways we have of being intelligent, and the tools and repertoire appropriate for responding to those differences.

Brain Research

In this book, the brain’s natural learning system will be explored. The principles of how the brain operates and the basic functions will be explained to set a context for learning. The interaction of the right and left hemispheres of the brain—*hemisphericity*—is integral to the learning process. This book examines the functions of each hemisphere as well as how to engage the whole brain in the learning process.

Learning Styles

Although we have discussed learning styles and multiple intelligences in the other books on *Differentiated Instructional Strategies* (Gregory & Chapman, 2002; Gregory, 2003; Gregory & Kuzmich, 2004; Gregory &

Kuzmich, 2005a, 2005b), we have given them limited attention as part of a more comprehensive approach to differentiation. This book will focus in more depth on the variety of learning styles frameworks and theories available for consideration and use by teachers.

Which learning styles theories and frameworks teachers choose from and among is less important than teachers' decisions to use learning styles as a way to get to know their students better and tap into the different preferences learners have through intentional planning. This book will provide an overview of the most popular and well-known learning styles and then offer suggestions for using that information in planning. It is also helpful for students to know about the diversity of preferences, styles, and dispositions in themselves and others to better understand and respond to the differences in their peers.

Intelligences

Intelligent Behaviors (Habits of Mind)

Art Costa's (Costa, 1991; Costa & Garmston, 1994, 2002) intelligent behaviors will be discussed. These behaviors can be developed in students so that they become more intelligent in their ways of learning and living.

Multiple Intelligences

We have learned and accepted over the years that there are many ways to be smart. Howard Gardner introduced us to seven intelligences and added an eighth later on. This theory, used naturally in planning thematic instruction by early elementary teachers, has been supported through research and study using criteria to substantiate all eight of the intelligences.

Gardner admits he is surprised by the reaction of teachers and the vast variety of ways they have found to use the theory in the classroom. We will revisit Gardner's eight multiple intelligences in this book, and you will find planning frameworks that consider both the intelligences and the learning styles as well. Several inventories for students are also included.

Successful Intelligence

Robert Sternberg's (1996) successful intelligence includes our ability to use information and knowledge practically, analytically, and creatively rather than just knowing facts and figures.

Emotional Intelligence

Daniel Goleman's (1995, 1998) emotional intelligences include five domains from which one needs to have skills and abilities to be competent

and capable members of society. These skills and how to promote them and integrate them into the curriculum will be discussed.

Thinking Styles

Students need to develop skills in both creative and critical thinking. Thinking is important to include in the curriculum as well as the types and styles of thinking. The taxonomies and tools I will discuss include the following:

- < Bloom (1956)
- < Quellmalz (1985)
- < Krathwohl's affective taxonomy (Krathwohl, Bloom, & Masia, 1964)
- < Graphic organisers
- < SCAMPER (Eberle, 1982)
- < Williams's creative taxonomy (Williams, 1989)

You Don't Need to Differentiate Every Detail

Differentiating for the diversity of learning styles, intelligences, and thinking in your classroom does not mean that you have to know every detail of every theory and individualise for every student. Simply becoming conscious of the collective needs of students is a way to get to know them better, tap into their preferences through intentional planning, explore the diversity that they bring to the classroom, and make the right choices for your classroom.

Learning, Growth, and the Brain

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In recent years, what we have learned about how the brain is organised and functions raises questions for us as teachers. According to Ornstein (1986), the brain is a complex biological organ made of several systems embedded within 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 . . . [but] 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. The truth is that the brain naturally learns what it needs to if there is useful information, if the information is interesting, and if the challenge is appropriate.

THE NATURAL PROCESS OF LEARNING

Restak (1994) identifies five systems that are constantly interacting, with multiple connections, as we accept, process, and interpret information. This is like a 24/7 “multiplex theater” according to Barbara Given (2002), where multiple movies are showing simultaneously. The five systems are the emotional learning system, the social learning system, the physical learning system, the cognitive learning system, and the reflective learning system.

Emotional Learning System

Emotions and social interactions that affect feelings can inhibit academic progress (Rozman, 1998). For example, students will seek first to be safe and comfortable before they care what there is to be learned. Emotional nourishment is essential from birth to death (Kessler, 2000; Palmer, 1993), and emotions have a huge effect on the ability to focus and learn. Endorphins and norepinephrine (the feel-good neurotransmitters released in the brain during positive experiences) contribute to learning as well as to good health (Pert, 1993). Emotions are both innate and acquired, learned from peers and parents throughout life but especially in the early years (Harris, 1998).

When our emotional needs are met, the brain produces serotonin (a feel-good neurotransmitter). Sometimes young people turn to drugs to eradicate the negative feelings in their lives, but feeling good without drugs can occur when students feel included and part of the group—that “warm, feel-good” reaction when they know someone cares. Csikszentmihalyi (1990) refers to the “state of flow” where attention is focused and one’s skill level is matched with an appropriate challenge. In this state, a person feels “in the groove” and capable and empowered to be successful.

The emotional system is embellished in classrooms and schools with the following attributes:

- < Where educators and students believe all students will learn
- < Where students’ differences are honored
- < Where teachers connect the learning to students’ lives
- < Where teachers provide multiple ways for students to show what they know
- < Where teachers continue to challenge students appropriately at their level
- < Where the climate is supportive, inclusive, and predictable
- < Where students and teachers celebrate the gains toward targeted standards
- < Where students and teachers can laugh and celebrate together
- < Where intrinsic motivation and pride in a “job well done” is fostered
- < Where students’ intrinsic motivation is cultivated through goal setting and reflection

Social Learning System

Part of the developmental process through the first few years of life is to form relationships with others. A system in place at birth relates to paired relationships. Another system progresses toward group relationships (Harris, 1998). It is a basic human need to feel that we belong and are accepted and included. Feelings of comfort, trust, respect, and affection

increase the brain's feel-good neurotransmitter levels (Panksepp, 1998). Often in classrooms there is such a quest to "cover the standards" that there is no opportunity to develop social interactions that promote trust and connections even though we know students will learn better in a supportive environment. A kinship fostered by group norms and values is more conducive to learning (Wright, 1994). Robert Sapolsky in his book *Why Zebras Don't Get Ulcers* suggests that social support has a huge impact on student learning. Students who feel part of the group and accepted by their peers are more confident and experience less stress in difficult learning situations. It is essential that teachers create a community of learners where every student feels a sense of belonging. A teacher who is aware of this need can capitalise on this knowledge by creating a classroom climate that provides the following:

- < Respect for all learners
- < Recognition for students' hopes and aspirations
- < A multisensory environment for real-world learning (Given, 2002)

The use of cooperative group learning is essential in a classroom, not only to allow the social system to flourish but also to help students achieve academic goals as well as social skills.

Physical Learning System

The physical learning system has to do with active involvement in learning. In classrooms, this is often the system that is not used enough even though we know that gifted students (Milgram, Dunn, & Price, 1993) and underachievers (R. Dunn, 1990) will benefit from active, tactile, and kinesthetic involvement with new material.

If we ignore this system, the learners will find a way to "actively" satisfy their needs in spite of our plans. The movement might seem a disruption and have nothing to do with the lesson at hand. So how do we build in opportunities for hands-on, active learning, or do we let students find their own ways, which may be counterproductive to learning? The physical system also demands movement to lower stress (adrenalin and cortisol, stress hormones in the blood stream) and supply more oxygen and glucose to the brain. Paul and Gail Dennison's book *Brain Gym* offers suggestions and activities to "wake up the brain" and integrate the right and left hemispheres.

Cognitive Learning System

The cognitive system deals with learning and focuses on consciousness, language development, attention, and memory. The senses are engaged

in actively processing information. Facilitating learning by providing information in a novel way—one that stimulates all senses, including the visual, auditory, and tactile senses as well as taste and smell if appropriate—is something good teachers do.

The emotional, social, and physical systems seem greedy for attention, and if their needs are not met, students will not be able to focus on learning; thus the cognitive system cannot work optimally. If all systems' needs are met, students tend to be more attentive and engaged in the learning process and ultimately are more successful in their learning.

Reflective Learning System

It has been said that 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 do the following:

- < Revisit and analyze situations
- < Explore and react with ideas
- < Create plans
- < Facilitate progress toward goals






With limited time and multiple standards to achieve, this may be the system that is ignored in the classroom. These skills of continuous reflection and self-awareness are key to growth. The skills of metacognition and reflection enable students to form a complete image of self and to develop the strategies necessary to self-directed learning and success in life.

Figure 1.1 lists needs and preferences within each system and suggests classroom activities/strategies that teachers can use to satisfy those needs and preferences.

SAFETY AND THE SURVIVAL BRAIN

The brain was put in the head not to go to school but to survive on the savannah. Its first tasks toward survival are to get upright and mobile, communicate, and develop trust through interpersonal relationships.

Figure 1.1 The Five Natural Learning Systems in the Classroom

System	Needs and Preferences	Classroom Strategies
 <p>Passion</p>	<ul style="list-style-type: none"> < Positive climate < Emotional safety < Relevancy and meaning < Supportive learning community < Tapping into range of emotions <p>Teacher as cheerleader, mentor</p>	<p>Build the classroom community and a positive climate by</p> <ul style="list-style-type: none"> < Building trust < Providing appropriate challenge and feedback < Adjusting assignments
 <p>Cooperation</p>	<ul style="list-style-type: none"> < Inclusion < Respect < Enjoy others < Interaction < Interpersonal sharing < Authentic situations < Tolerance and diversity honored <p>Teacher as consultant, coach</p>	<ul style="list-style-type: none"> < Developing norms < Using teambuilding activities < Outlawing “put downs” < Using cooperative group learning < Simulations
 <p>Intention</p>	<ul style="list-style-type: none"> < Promotes academic skill development < Connects prior learning and new learning < Seeks patterns, concepts, themes < Likes to see parts and the whole <p>Teacher as facilitator</p>	<ul style="list-style-type: none"> < Thinking skills < Graphic organisers < Advance organisers < Note taking and summarising < Hypothesising < Problem solving
 <p>Action</p>	<ul style="list-style-type: none"> < Requires active involvement < Enjoys challenging tasks that encourage practice < Skills are a major part of this system <p>Teacher as coach</p>	<ul style="list-style-type: none"> < Mime < Pantomime < Role play < Building models < Hands on < Manipulatives < Simulations
 <p>Introspective</p>	<ul style="list-style-type: none"> < Personal reflection on one’s own learning styles < Reflects on successes, failures, changes needed < Metacognition of one’s strengths and preferences <p>Teacher as gold miner</p>	<ul style="list-style-type: none"> < Logs < Journals < Tickets out < Goal setting < PMI

Unfortunately, when we look around schools, many classrooms are diametrically opposite to these basic human quests. Classrooms where students are to stay in desks, not talk to others, and compete against their peers do not support the brain's natural functions and tendencies. This produces undue stress, and when there is stress, no thinking takes place. A person concerned with basic needs is not able to attend to the learning that should be taking place. The brain is no longer functioning in the neocortex but in the reptilian brain where there is no language or thought processing but instead a basic "fight or flight" reaction.

If students are controlled to the point where there is no option or choice to pursue learning in their own style or to show what they know in their own way, they will be stressed. If they have to find the one right answer by doing only one prescribed task, this may add unnecessary stress (and boredom) for the learner.

Choice and options give learners a sense of control over their own learning. The optimal climate we should be striving for is *high challenge, low threat*, where skill and task are balanced so that students can see success while stretching their skills and thinking. Csikszentmihalyi (1990) refers to this condition as flow, where the following conditions exist:

- < Challenge and skill level are well matched.
- < Choice and options are available.
- < Feedback is ongoing.
- < There is an intrinsic sense of satisfaction.
- < Time goes by unnoticed.
- < The learner is in the groove.
- < Students are inspired by the task or activity to persevere.

This is a mammoth challenge when there is one teacher and a classroom full of diverse learners, but paying attention to learning styles and using strategies to give students choice and options give flow a greater chance of happening.

Not only is physical safety necessary in the classroom but so are emotional and psychological safety. Students need to know they are safe to share ideas and offer opinions without fear of ridicule, sarcasm, teasing, and antagonism from teachers or other students. This kind of positive climate is facilitated through the following:

- < Norms that students generate and support (rules to live by)
- < An orderly and consistent environment that is nurturing and patient
- < Choice and options rather than control
- < Respect for diversity: cultural, thinking, learning style
- < Positive reinforcement and encouragement
- < Invitational approaches that engage rather than exclude
- < A sense of community and belonging in the group