Second Edition

DIFFERENTIATION *and* THE BRAIN

How Neuroscience Supports the Learner-Friendly Classroom

DAVID A. SOUSA

CAROL ANN TOMLINSON

555 North Morton Street
Bloomington, IN 47404
800.733.6786 (toll free) / 812.336.7700
FAX: 812.336.7790

email: info@SolutionTree.com
SolutionTree.com

Visit **go.SolutionTree.com/instruction** to download the free reproducibles in this book.

Printed in the United States of America

Library of Congress Cataloging-in-Publication Data

Names: Sousa, David A., author. | Tomlinson, Carol A., author.
Title: Differentiation and the brain : how neuroscience supports the learner-friendly classroom / authors: David A. Sousa and Carol Ann Tomlinson.
Description: Second Edition. | Bloomington, Indiana : Solution Tree Press, [2018] | Previous edition: 2011. | Includes bibliographical references and index.
Identifiers: LCCN 2017033583 | ISBN 9781945349522 (perfect bound)
Subjects: LCSH: Individualized instruction--Psychological aspects. | Learning, Psychology of. | Brain. | Neurosciences.
Classification: LCC LB1031 .S65 2018 | DDC 371.39/4--dc23 LC record available at https://lccn.loc.gov/2017033583

Solution Tree
Jeffrey C. Jones, CEO
Edmund M. Ackerman, President

Solution Tree Press
President and Publisher: Douglas M. Rife
Editorial Director: Sarah Payne-Mills
Art Director: Rian Anderson
Managing Production Editor: Caroline Cascio
Senior Production Editor: Suzanne Kraszewski
Senior Editor: Amy Rubenstein
Copy Editor: Evie Madsen
Proofreader: Jessi Finn
Text and Cover Designer: Rian Anderson
Editorial Assistants: Jessi Finn and Kendra Slayton

Visit **go.SolutionTree.com/instruction** to download the free reproducibles in this book.

Table of Contents

Reproducible pages are in italics.

About the Authors

David A. Sousa, EdD, is an international consultant in educational neuroscience and author of more than a dozen books that suggest ways educators and parents can translate current brain research into strategies for improving learning. He has made presentations to more than two hundred thousand educators across the United States, Canada, Europe, Australia, New Zealand, and Asia. Dr. Sousa has taught senior high school science and served as a K–12 director of science and a district superintendent in New Jersey schools. He has been an adjunct professor of education at Seton Hall University and a visiting lecturer at Rutgers University.

Dr. Sousa is past president of the National Staff Development Council (now Learning Forward). He has received numerous awards, including the Distinguished Alumni Award and an honorary doctorate from Bridgewater State University and an honorary doctorate from Gratz College in Philadelphia. Dr. Sousa has been interviewed on the NBC *Today* show and by National Public Radio about his work with schools using brain research.

Dr. Sousa has edited science books and published dozens of articles in leading journals on staff development, science education, and educational research. His most popular books for educators include *How the Brain Learns, Fifth Edition*; *How the Special Needs Brain Learns, Third Edition*; *How the Gifted Brain Learns, Second Edition*; *How the Brain Learns to Read, Second Edition*; *How the Brain Influences Behavior: Management Strategies for Every Classroom*; *How the Brain Learns Mathematics, Second Edition*; *The Leadership Brain: How to Lead Today's Schools More Effectively*; *Engaging the Rewired Brain*; and *Mind, Brain, and Education: Neuroscience Implications for the Classroom.* His books have been published in French, Spanish, Chinese, Arabic, Korean, and several other languages.

Dr. Sousa has a bachelor's degree in chemistry from Bridgewater State University in Massachusetts, a master of arts in teaching degree in science from Harvard University, and a doctorate from Rutgers University. He makes his home in south Florida.

Carol Ann Tomlinson, EdD, is a faculty member at the University of Virginia's Curry School of Education, where she is the William Clay Parrish Jr. Professor and chair of the Department of Education Leadership, Foundations and Policy. Dr. Tomlinson codirects the university's Institutes on Academic Diversity. As a consultant and presenter, Dr. Tomlinson works with teachers throughout the United States and internationally to develop more responsive, heterogeneous classrooms. Her education experience includes twenty-one years as a public school teacher and twelve years as a program administrator of special services for struggling and advanced learners.

During her time in the public school classroom, Dr. Tomlinson was recognized by the state of Virginia as Teacher of the Year. She has focused on a number of critical issues throughout her career, including curriculum and instruction for struggling and advanced learners, effective instruction in heterogeneous settings, and encouragement of creative and critical thinking in the classroom.

She was named Outstanding Professor in the Curry School of Education in 2004 and received an All-University Teaching Award in 2008. In 2017, she ranked thirteenth in the Education Week Rick Hess Straight Up Edu-Scholar Public Influence Rankings of academics having the greatest impact on discussions about education policy.

Dr. Tomlinson is the author of more than three hundred articles, book chapters, books, and professional development materials. Among her books on differentiation are *How to Differentiate Instruction in Academically Diverse Classrooms, Third Edition*; *The Differentiated Classroom: Responding to the Needs of All Learners, Second Edition*; *Fulfilling the Promise of the Differentiated Classroom: Strategies and Tools for Responsive Teaching*; *Integrating Differentiated Instruction and Understanding by Design: Connecting Content and Kids* (with Jay McTighe); *Leading and Managing a Differentiated Classroom* (with Marcia B. Imbeau); and *Leading for Differentiation: Growing Teachers Who Grow Kids* (with Michael Murphy). Her books on differentiation are available in fourteen languages.

She has a bachelor's degree from the University of South Carolina and a master's degree and doctor of education degree from the University of Virginia.

Some resources on differentiation are available at www.differentiationcentral.com, or follow Carol on Twitter @cat3y.

To book David A. Sousa or Carol Ann Tomlinson for professional development, contact pd@SolutionTree.com.

Introduction

With so many books available on differentiation, why do we need this one? That is a fair question, and here is our answer. To our knowledge, this book is different from all the others in that it combines two imperatives facing nearly all educators.

1. Research is revealing so much about how the brain learns that educators can no longer ignore the implications of these discoveries for educational practice.
2. Teachers need to find ways to use this brain research to develop strategies that will allow students to succeed in classrooms with a diverse mix of abilities, cultures, and languages—hallmarks of contemporary schools.

The neuroscientific research discoveries that can affect educational practice have accumulated since the 1980s, leading to a whole new exciting discipline called *educational neuroscience*, which brings together related research from cognitive psychology, neuroscience, and pedagogy. This research pool offers information and insights that can help educators decide whether certain curricular, instructional, and assessment choices are likely to be more effective than others. In this book, we examine the basic components of differentiation in light of what current research reveals, and the result is surprisingly positive, indeed. We want to share those surprises with the reader.

In this book, we examine the basic components of differentiation in light of current research, and the result is surprisingly positive, indeed.

How Brain Friendly Is Differentiation?

As authors and longtime educators, we focus on somewhat different areas of educational practice. Carol has been intimately involved in developing frameworks for establishing differentiated classrooms at all grade levels and in all subject areas—and teaching in them. David has investigated how the findings from cognitive and neuroscientific research could be translated into what educators do in schools and classrooms. When we discussed the possibilities for this book, we recognized that the processes for differentiating curriculum, instruction, and assessment are supported in many ways by what researchers

in cognitive psychology and neuroscience are revealing about how the brain learns. In other words, differentiation is brain friendly and brain compatible.

The Rise, Fall, and Rise of Differentiation

Differentiation is not a new idea. Think back to the one-room schoolhouse of the late 19th and early 20th centuries, where one teacher had to educate students of varying ages and grade levels at the same time in a single classroom. That teacher had to be an expert in differentiating curriculum, instructional strategies, and assessment techniques. Using only a few resources—chalk, slates, and some books—the students learned literacy, arithmetic, penmanship, and good manners. In this environment, the students and teacher were often together for several years in a row, so they got to know each other very well. This close relationship allowed the teacher to tailor instruction for an individual student. No doubt, the seeds of cooperative learning sprouted here, too, as older students helped the younger ones. In these settings, teaching the class as a whole made little practical sense given the range of student needs in the classroom.

As the population grew, public schools got bigger. Students were separated into single grade levels, according to their age. Class size was small, and John Dewey's (1938) notion of a school as a caring community encouraged teachers to address the needs of individual students. Curriculum decisions were made locally and reflected the community's needs. Some towns wanted their students to have more academic subjects, while others focused on developing their students' vocational and agricultural skills. Differentiated classrooms were still quite common.

Although students within a grade level still demonstrated varying degrees of readiness and maturity, the prevailing and powerful industrial model began to shape educational philosophy and school operations in the 1930s. Within this organizational structure, differentiation in the classroom yielded to the seemingly more efficient middle-of-the-road approach to teaching. Academic subjects were departmentalized, class sizes grew even larger, and secondary-level teachers became content specialists. Differentiation waned as the one-size-fits-all curriculum emerged as the common basis for instruction.

While school districts were becoming more *alike* in their curriculum, instruction, and assessment practices, the school population was becoming more *diverse*.

Because of fears that local U.S. school districts still had too much autonomy and variation, in the 1960s, states began to exert more control over their operations. State departments of education generated curriculum standards and developed standardized tests that nearly all students had to take to graduate high school. Meanwhile, the immigrant population mushroomed, bringing more languages and cultures into the society, and urban flight widened the economic gap between neighboring communities. So, while school districts across the United States were becoming more *alike* in their curriculum,

instruction, and assessment practices, the school population was becoming more *diverse*.

Since 2007, nationwide and international test results, such as the Programme for International Student Assessment (PISA) and Trends in International Mathematics and Science Study (TIMSS), show only modest—if any—gains in student achievement across the grades. Secondary students in the United States continued to score lower than students in most other developed countries. In an attempt to improve performance, policymakers called for reforms that put even more emphasis on standards and testing (for example, the No Child Left Behind Act, 2002). In the face of these pressures to standardize, educators came to realize that the one-size-fits-all approach does not succeed with many students in today's classrooms. It became evident that the broad range of abilities, languages, and cultures in U.S. schools requires teachers to incorporate different approaches to instruction within the same classroom—a return, to some degree, to the diverse strategies of the one-room school. The idea of differentiation was reborn.

About This Book

Some school districts have long sought ways to maintain differentiation in their classrooms despite the driving forces of unreasonable amounts of content to cover and the accompanying high-stakes testing. As policymakers and communities continue to recognize the growing diversity of their student population, more schools will turn to differentiation to help this broad mix of students succeed. In this book, we offer suggestions on how to establish and manage differentiated classrooms without imposing additional heavy burdens on teachers. We talk about teaching *differently* and *smarter*, not *harder*. In fact, when properly implemented, differentiation emphasizes shared responsibility between teacher and student—a desirable outcome, because the brain that does the work is the brain that learns.

Differentiation emphasizes shared responsibility between teacher and student, because the brain that does the work is the brain that learns.

Questions This Book Will Answer

This book will answer questions such as the following.

- What kind of model can teachers use as a basis for setting up a differentiated and brain-friendly classroom?
- How do the mindsets of teachers and students affect differentiation?
- What kind of learning environment is most conducive to learning and differentiation?
- What are the five major components of a brain-friendly quality curriculum?

- What are effective practices for assessing student achievement to inform teaching and learning?
- What does *student readiness* mean, and how do teachers respond to it?
- How important are student interests in the differentiated classroom, and how are they handled?
- What are the components of learning profiles, and how do teachers plan for them?
- What are some strategies for effectively leading students and managing the routines in a differentiated classroom?

In this edition, we updated references and added the findings from new educational neuroscience research that support the elements of differentiated instruction. We have included new instructional strategies and teacher-tested examples related to implementing differentiated instruction components, as well as offered new guidance on working with issues related to learning profiles.

Chapter Contents

This book contains the following eight chapters that explore differentiation and the brain.

- **Chapter 1: The Nonnegotiables of Effective Differentiation—** In this chapter, we describe differentiation and its research base. We present a model that incorporates the basic elements of a differentiated classroom and give a brief overview of the model's parts we discuss in greater detail in succeeding chapters.
- **Chapter 2: Mindset, Learning Environment, and Differentiation—**Here we explore different teacher and student mindsets and how they may affect teaching and learning. We describe the impact of the classroom and school environment on body chemistry, as well as on social needs and other factors that affect student learning.
- **Chapter 3: Curriculum and Differentiation—**This chapter deals primarily with the five important components of a brain-friendly quality curriculum. We discuss each component and suggest ways to implement it in a differentiated classroom.
- **Chapter 4: Classroom Assessment and Differentiation—** Because assessment is such an integral part of teaching and learning, we devote this chapter to examining the nature and purposes of assessment. We focus particularly on those assessment strategies more likely to be effective because they guide teachers in addressing the diversity among learners.

- **Chapter 5: Differentiating in Response to Student Readiness—** *Student readiness* is often equated with *student ability,* but they are not the same. In this chapter, we explain the differences, discuss why readiness matters, and offer suggestions for responding to student readiness through the learning environment as well as through curriculum, assessment, and management strategies.
- **Chapter 6: Differentiating in Response to Student Interest—** How much interest a person has in learning something is a key factor in that person's motivation to learn and subsequent achievement (Amabile, 1983; Bruner, 1961). Here, we state why addressing students' interests can make for challenging, rewarding, and successful learning activities. We include suggestions for taking students' interests into account when supporting an invitational learning environment and when planning curriculum, assessment, and management strategies.
- **Chapter 7: Differentiating in Response to Student Learning Profile—**Although teachers are aware that students learn in different ways, planning for these differences on a day-to-day basis may seem impractical. But that is not the case. In this chapter, we describe some components of learning profiles, variables that affect learning profiles, pitfalls of learning styles, and guidelines teachers can use to plan for differing student learning approaches.
- **Chapter 8: Managing a Differentiated Classroom—** Our suggestions in the preceding chapters may at first seem overwhelming, but with careful and thoughtful planning, teachers can implement them in productive ways. This chapter helps with that careful and thoughtful planning. It explores the differences between *classroom leadership* and *classroom management* and suggests how teachers can use their leadership skills to move students through challenging and exciting learning opportunities in a differentiated learning environment.

Other Helpful Tools

This book includes helpful tools such as vignettes, scenarios, and exercises that provide an opportunity for reflection and real-life application.

- **A Case in Point and A Better Scenario:** These vignettes appear in chapters 1 through 8. Positioned at the beginnings of these chapters, A Case in Point describes situations in a typical classroom. At the chapter conclusions, A Better Scenario describes how the classroom situations might improve if the teacher plans for the differentiation component discussed in that chapter. Our

hope is these vignettes will demonstrate how using the suggested strategies could make for a positive and productive learning environment and success for students.

- **In the Classroom:** These scenarios are intended to help educators envision how various aspects of differentiation, including specific instructional strategies, might look in action in specific, brain-friendly classroom settings.
- **Exercises:** In nearly every chapter, we offer questions for reflection along with multiple suggestions about how to design and implement strategies associated with the topic discussed in that chapter. These questions and suggestions come not only from the psychological and neuroscientific research but also from research on the best educational practices associated with differentiation and brain-compatible instruction.

As we gain a greater understanding of how the human brain learns, we may discover ways to better meet the needs of our increasingly diverse student population. Sometimes, students are attempting to learn in environments designed to help but that instead inadvertently hinder their efforts. By looking for ways to differentiate instruction and change some of our assessment approaches, we may be able to help more students achieve their full potential. We understand the considerable imperfections in many teaching environments. We know teachers long for smaller class sizes, larger rooms, more materials, more time for planning, and more relevant professional support. We are keenly aware of—and saddened by—the unremitting pressure to raise test scores that persists in many schools. We are hopeful those realities won't outlive us all. In the end, teachers enrich and enliven young lives when they say, "These are my students. This is the only time they will ever experience this grade or these subjects. I understand both the opportunity and the responsibility this presents to me. I will see these students as three-dimensional human beings. I will learn about them. I will continue to sharpen the art and science of my work so I can teach them the best possible content in the best possible ways. I will do whatever I can in this time and place to support the success of each student who comes to me."

Our hope is that this book will encourage all school professionals to learn more about how the brain learns and about approaches to differentiation so we can work together for the benefit of all students. In other words, we hope this book will help teachers sharpen their knowledge of the science that illuminates the art of effective teaching and inspire them to use that knowledge to benefit the students they teach.

CHAPTER 1

The Nonnegotiables of Effective Differentiation

It seems awkward to even have to discuss the idea of differentiating curriculum and instruction to meet the needs of different kinds of learners, but the reality is that too many classrooms are still teaching with the focus of "one for all and all for one." . . . Traditional school structures . . . make the idea of differentiating to maximize learning a mountain still to be climbed. But we must [climb it].

—H. Lynn Erickson

At an education conference focused on teaching and learning, a veteran teacher shared that she was teaching a multi-age class for the first time in her twenty-plus-year career as an educator.

"That must be quite an adjustment for you," said the younger educator seated beside her. The more senior teacher reflected for just a moment and responded, "Actually, it really hasn't been an adjustment for me. I've taught a multi-age classroom every year. But this is just the first time someone put the sign on my door."

What we now call *differentiated instruction* is not new. It simply asks educators to recognize what teachers have known for centuries: students do not arrive at school as *matched sets.* Because the pace of brain development varies among children, it is likely that in any third-grade class, some students are reading much like first graders and others like sixth graders. A third grader who reads like a second grader may be ready to do fractions in mathematics well before most of her classmates. In other words, the fact that all students in a particular classroom share a similar birth date is no indication they all learn at the same rate, in the same way, and with the same support systems.

Few educators seriously debate whether a particular chronological age is a trustworthy predictor of a student's academic accomplishments. Most of

us who have taught have ample evidence that academic variance is a given among students of any grade level—preschool through graduate school. The fundamental question each teacher has to answer is whether to respond to those differences—and if so, in what way.

A great number of teachers plan and teach as though all the students in a given classroom are essentially alike. When it becomes evident that some students are confused, lost, or bored, some teachers quickly try to offer additional encouragement, support, or work as a means of addressing the mismatch between lesson and learner. Others simply follow their initial instructional plans. After all, they remark, there's a lot of material to cover.

A Case in Point

It was just the first week of school, and already Mrs. Worrell felt tired. Her class enrollment was higher this year than last. The students in front of her came from several different language groups, from a broad spectrum of economic groups, and with a five-year span of achievement in reading and mathematics. Her job was to get all the students ready to pass the same test on the same day under the same conditions. She had nine months to do that. The year stretched ahead of her like a bad movie. She had too many students, virtually no planning time, no one to help in the classroom, a single textbook for each subject, too few supplies, too much content, and a mandate to make sure everyone would look competent on the test that loomed ahead of them all. She looked at the students as they left the room to get on the afternoon school buses. They looked as weary as she felt. She wondered if everyone in the building felt that way.

A Focus on Learners

Differentiation stems from the research-based perspective that students will engage more fully with learning and learn more robustly when teachers proactively plan with their differences—as well as their similarities—in mind (Tomlinson, 2017; Tomlinson et al., 2003). Such an instructional model is learner centered; it accepts the premise that a teacher's role is not simply to cover material or expose students to content, but rather to maximize student learning. Therefore, if a student is missing knowledge or skills from the past necessary for success with current learning expectations, the teacher's role is to help that student move both backward and forward with essential content. If a student already knows what a teacher is about to teach, the teacher's role is to help that student move beyond current learning expectations so growth will continue. Similarly, differentiation operates from the premise that if a student is not learning efficiently or effectively in one mode, a wise teacher looks for another pathway to learning that will work for that student, and if content seems irrelevant to or disconnected from a student's world, the teacher seeks to build bridges between critical content and student interests.

The bedrock of differentiation is a five-part argument foundational to effective teaching.

1. The environment students are asked to learn in must invite learning. That is, it must be safe, challenging, and supportive for each student. To that end, the learning environment calls for a teacher who has a growth (fluid) mindset (Dweck, 2006), who forges meaningful connections with each learner, and who brings students together in a mutually supportive community or team of learners.
2. A teacher should be able to clearly delineate what constitutes essential knowledge, understanding, and skills in a content area, unit, and lesson. In addition, both instruction and assessment should have a central focus on student understanding, lessons planned for high student engagement, and a curriculum designed to *teach up* (that is, to begin with a curriculum that challenges advanced learners, and follow with plans to scaffold other students to enable them to work with that rich and powerful curriculum).
3. The teacher should persistently assess student status relative to the essential knowledge, understanding, and skills throughout a segment of study. Using assessment information to help the teacher and students understand a learner's current proximity to essential knowledge, understanding, and skills is the compass for differentiation.
4. When ongoing assessment data indicate a student is confused, has learning gaps, or has already mastered essential knowledge, understanding, or skills, the teacher should use that information to plan upcoming instruction to move each learner ahead. The idea is to address those needs that, if left unattended, will most likely impede student growth.
5. In order to have the flexibility necessary to work differently with individual students at least some of the time, the teacher needs to guide students in understanding the nature and purpose of a differentiated classroom, work with them to establish and maintain effective norms for classroom operation, and manage classroom routines that balance the predictability and flexibility necessary to address a range of student differences.

When we look at differentiation in these terms, we see it is neither revolutionary nor something extra. It is simply teaching mindfully and with the intent to support the success of each human being for whom we accept professional responsibility. It moves us away from seeing and teaching students as a unit toward reflecting on and responding to them as individuals, as well as to the needs of the group as a whole.

Differentiation is neither revolutionary nor something extra. It is simply teaching mindfully and with the intent to support the success of each human being for whom we accept professional responsibility.

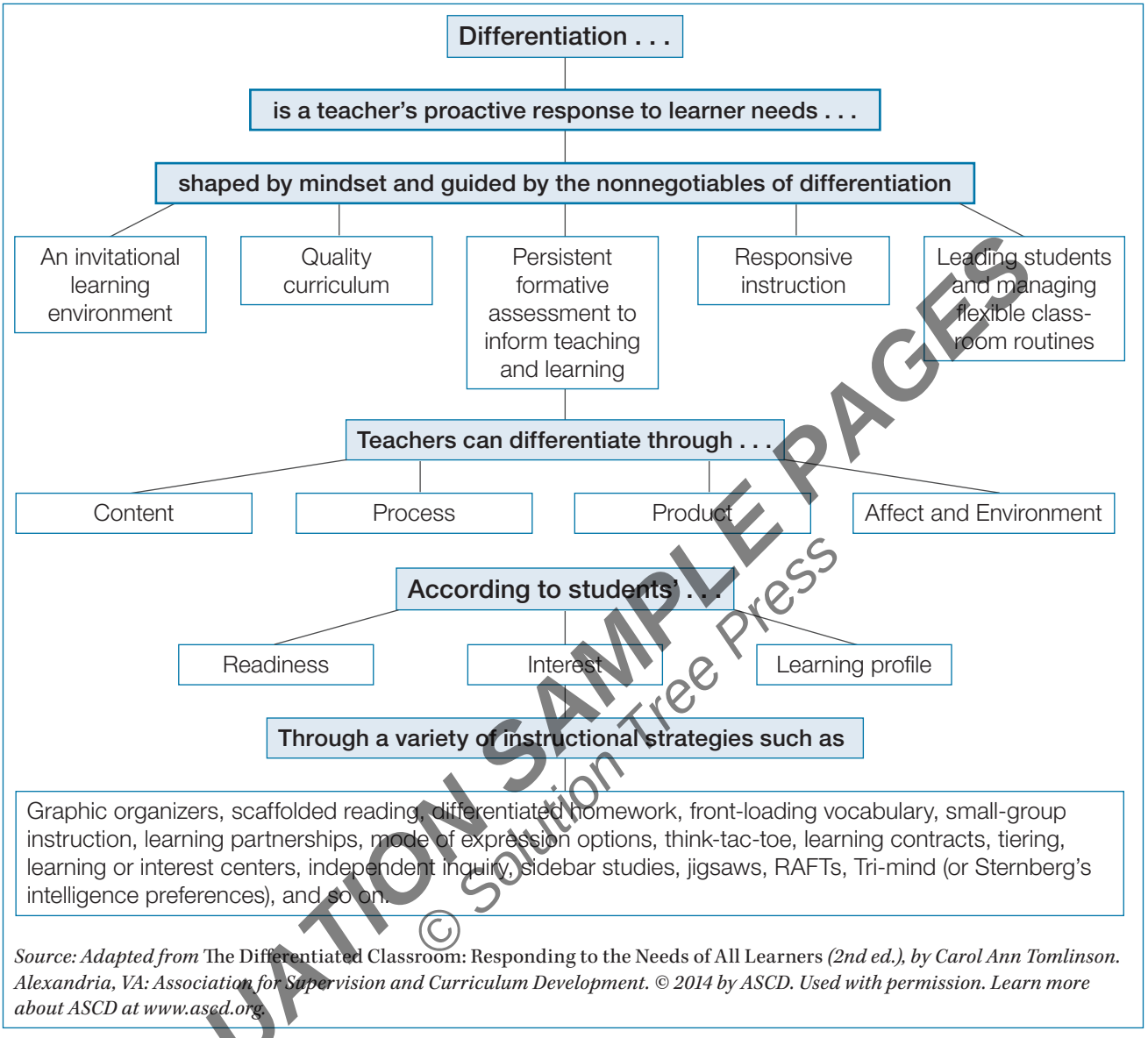
Differentiation, therefore, is not a particular set of strategies, but a way of thinking about teaching and learning. It provides a framework for planning and carrying out learner-focused instruction. While a substantial differentiation model will offer instructional tools and strategies that facilitate attention to varied learner needs, it will also counsel teachers to use approaches that work for their particular students, content, and strengths and proclivities as professionals.

A Model for Effective Differentiation

Figure 1.1 presents one model of differentiation (Tomlinson, 2014, 2017). Its five key components—(1) an invitational environment, (2) rich curriculum, (3) assessment to inform teaching and learning, (4) responsive instruction, and (5) leading students and managing routines—which we regard as the *nonnegotiables* of effective differentiation, will serve as the foundation for this book. The components are nonnegotiable in the sense that they stem from what we know about how people learn and how strong teachers teach. Each of the model's components is part of an interdependent system of classroom elements, and thus when any one of them is weak, the other elements in the system will suffer. Classrooms in which all the elements work together effectively are classrooms likely to work for a broad range of learners. The remainder of this chapter briefly explains these five components, or nonnegotiables, and the general support for them in brain research. The rest of the book explores, in greater detail, the nonnegotiables and the brain research that relates to them.

The model begins with the assertion that differentiation is a teacher's response to learner needs. We are well aware that many teachers are very concerned about the impact of state, provincial, and curriculum standards; advanced placement or International Baccalaureate course requirements; and high-stakes testing on their instructional decisions and time. They worry about how they can address these concerns and still respond to the needs of diverse learners through differentiation. Many of the suggestions we offer do not require much additional time in planning and preparation because they should often replace rather than add to current instructional practices. In the end, instructional practices that promote greater learning for more students will both improve achievement scores and benefit the learners who take the tests.

Further, the model we discuss in this book asserts that a teacher's belief about the capacity of each student to succeed with essential content affects everything in the classroom. Teachers who believe that some students are smart and some are not have little difficulty with the outcome when some students succeed academically and others do not. After all, they conclude, that's just the way the world works. By contrast, teachers who believe that



Source: Adapted from The Differentiated Classroom: Responding to the Needs of All Learners *(2nd ed.), by Carol Ann Tomlinson. Alexandria, VA: Association for Supervision and Curriculum Development. © 2014 by ASCD. Used with permission. Learn more about ASCD at www.ascd.org.*

Figure 1.1: A model of differentiation.

virtually all students can master important content as long as teachers support them and the students are willing to work hard enough draw a different conclusion. For those teachers, success is really the only acceptable outcome. Carol Dweck (2006) calls the first perspective a *fixed mindset* and the second a *fluid* or *growth mindset.* Teachers with a growth mindset believe it is their role to do what is necessary to be a catalyst for student success and also to enlist the student effort necessary for success. Differentiation calls on teachers to develop a growth mindset and ensure their students do so as well. We discuss teacher mindsets at length in chapter 2 (page 19).

The model delineates five key components that guide effective differentiation: (1) an invitational learning environment, (2) quality curriculum,

(3) persistent formative assessment, (4) responsive instruction, and (5) leading students and managing flexible classroom routines. These components are integral to a classroom system in which all the parts work together to create peak learning and align with the core tenets of differentiation—each student is worthy of dignity and respect and should have access to the best learning opportunities a school can offer.

1. **An invitational learning environment:** The learning environment in a differentiated classroom needs to invite all kinds of learners to invest their best efforts to learn fully and deeply. This sort of learning environment requires teachers who see each of their students optimistically, understanding that all learners can, with appropriate support, achieve much more than they believe they can; foster meaningful teacher-student relationships; and have a sense of community in which every member is valued and supported in contributing to the success of individuals and the group as a whole.
2. **Quality curriculum:** What students are asked to learn (the curriculum) is rooted in the critical ideas of a topic or discipline. The curriculum itself reflects the teacher's belief that everyone in the class is *capable*. It is designed to support student understanding rather than only recall. Goals for each step of the teaching-learning process are absolutely clear to teachers and students alike. Teachers plan lessons with high relevance to students and for high student engagement.
3. **Persistent formative assessment to inform teaching and learning:** Teachers use ongoing assessment to inform their instruction. With clarity at each stage of the learning process about what students should know, understand, and be able to do as a result of that segment, teachers use preassessment to understand where students are relative to essential goals as a unit begins. This allows the teacher to match instruction to student needs from the outset, including attending to gaps in prerequisite knowledge. Throughout a unit of study, the teacher persistently uses formative assessment to understand and help students understand who is progressing as he or she should be, who is confused or falling behind, and who is ready to move beyond the fundamental expectations for achievement. Using this continual and unfolding sense of each student's relationship to critical outcomes, the teacher modifies instructional plans to attend to students' varied strengths and needs with the goal of helping each student grow academically as effectively and efficiently as possible. The teacher also involves students in understanding their formative assessment outcomes so they can plan their own successful next steps.
4. **Responsive instruction:** Teachers use preassessment and formative assessment results to finalize instructional plans for the days ahead.

It becomes clearer which students may be ready to work with more complex tasks, and which may need scaffolding or clarification in some aspect of the content. This is also a time when teachers can plan to link content to students' interests so learning is more engaging, and to provide varied approaches to learning so students find learning more accessible and efficient.

5. **Leading students and managing flexible classroom routines:** In a classroom where teachers intend to work with individuals and small groups as well as with the class as a whole, it's necessary to work together with students to design and implement classroom routines that provide both predictability and flexibility. Central in this process is helping students develop an understanding of what it means to design and create a class to work for each student—in other words, an understanding of differentiation. From that point, the teacher, with his or her student partners, can develop and implement routines that enable students to work successfully individually, in a variety of groupings, and as part of the class as a whole. It's useful to think about the process of guiding a student-focused classroom in two parts: (1) leading students to understand the purpose and nature of differentiation, and (2) managing classroom routines.

The model of differentiation highlights four classroom elements teachers can modify in response to three categories of student need. Teachers can modify (1) *content* (what students will learn or how they will gain access to what they must learn), (2) *process* (activities students use to make sense of or *come to own* essential content), (3) *product* (how students demonstrate what they know, understand, and can do after extended periods of learning), and (4) *affect* (attention to students' feelings and emotional needs) and *learning environment* (including both physical and affective contexts). Modifying these four elements makes room for student variance in the three areas of need: (1) *readiness* (proximity to learning goals), (2) *interest* (proclivities for particular ideas, topics, or skills), and (3) *learning profile* (preferences for approaches to or modes of learning). As teachers become more competent and confident in adapting content, process, product, and affect in response to student readiness, interest, and learning profile, the likelihood of academic success and maximum student achievement grows exponentially (Tomlinson, 2017).

Finally, the model presents a variety of instructional strategies for teachers to address student variance. These approaches extend the capacity of the teacher to reach out to students differently when warranted, yet still keep virtually all learners focused on essential outcomes. Such strategies include small-group instruction, varying materials, learning contracts, tiers, expert groups, jigsaws, RAFTs, and many, many other methods. When teachers are comfortable with a wide range of instructional strategies, addressing