

# Table of Contents

Reproducible pages are in italics.

<b>About the Authors</b> . . . . .	<b>ix</b>
<b>Introduction</b> . . . . .	<b>1</b>
How Brain Friendly Is Differentiation? . . . . .	1
The Rise, Fall, and Rise of Differentiation . . . . .	2
About This Book . . . . .	3
Questions This Book Will Answer . . . . .	3
Chapter Contents . . . . .	4
Other Helpful Tools . . . . .	5
<b>1 The Nonnegotiables of Effective Differentiation</b> . . . . .	<b>7</b>
A Focus on Learners . . . . .	8
A Model for Effective Differentiation . . . . .	10
Brain Research and Differentiation . . . . .	14
Differentiation in a Nutshell . . . . .	16
<b>2 Mindset, Learning Environment, and Differentiation</b> . . . . .	<b>19</b>
What Are Mindsets? . . . . .	20
The Effective Teacher's Mindset . . . . .	21
Teachers Have a Lifelong Impact . . . . .	21
The Classroom Must Feel Safe and Secure . . . . .	22
All Students Want to Succeed . . . . .	23
Teachers Must Meet the Social-Emotional Needs of Students . . . . .	24
Technology Is Affecting Social Skills . . . . .	26
Empathy Is Very Important . . . . .	26
Students Should Feel a Sense of Ownership of Their Education . . . . .	27
Teachers Should Identify and Reinforce Each Student's Areas of Competence . . . . .	27

Teachers Should Address Fears of Failure and Humiliation . . . . .	28
Discipline Is a Teaching Process . . . . .	28
Fixed and Growth Mindsets . . . . .	29
Mindset, Teaching, and Learning . . . . .	29
Fixed and Growth Mindsets and Differentiation . . . . .	31
Classroom Environments and Differentiation . . . . .	33
Learning Environments, Student Affect, and Differentiation . . . . .	34
Learning Environments, Student Cognition, and Differentiation . . . . .	36
<i>Exercise 2.1</i>	
<i>Questions for Teachers About Mindset, Learning Environment, and Differentiation . . . . .</i>	<i>39</i>
<i>Exercise 2.2</i>	
<i>Questions for Teachers About Student Affective Needs, Learning Environment, and Differentiation . . . . .</i>	<i>41</i>
<i>Exercise 2.3</i>	
<i>Reflections on Cognitive Traits of Learners and the Environments That Support Those Traits . . . . .</i>	<i>45</i>
<i>Exercise 2.4</i>	
<i>Questions for Teachers About Student Cognitive Needs, Learning Environment, and Differentiation . . . . .</i>	<i>47</i>
<b>3 Curriculum and Differentiation . . . . .</b>	<b>49</b>
The Importance of a Quality Curriculum . . . . .	49
Quality Curriculum Is Organized Around Essential Content Goals . . . . .	51
Curriculum Races Are Not Brain Friendly . . . . .	52
Specificity Is Important . . . . .	54
Quality Curriculum Is Aligned . . . . .	55
Quality Curriculum Focuses on Student Understanding . . . . .	56
Learning Tasks Should Extend Understandings . . . . .	58
Understandings Build Neural Networks . . . . .	59
Different Pathways Lead to Common Goals . . . . .	60
Quality Curriculum Engages Students . . . . .	61
Quality Curriculum Is Authentic . . . . .	62
Quality Curriculum Is Effectively Differentiated . . . . .	64
<i>Exercise 3.1</i>	
<i>Questions for Teachers About the Quality of a Curriculum Unit . . . . .</i>	<i>65</i>
<b>4 Classroom Assessment and Differentiation . . . . .</b>	<b>67</b>
Baggage From the Past: Negative Images of Classroom Assessment . . . . .	67
Testing and Stress . . . . .	69
Stress and Recall . . . . .	69
Stress and Timed Tests . . . . .	70

A More Productive View of Assessment . . . . .	71
Purposes of Classroom Assessments. . . . .	74
Assessment of Learning . . . . .	74
Assessment for Learning. . . . .	77
Assessment as Learning . . . . .	77
Assessment and Differentiation. . . . .	79
Grading and Differentiation. . . . .	82
The Importance of Clear Goals . . . . .	86
<i>Exercise 4.1</i>	
<i>Questions for Teachers to Ask to Determine Whether an Assessment Is Effective</i> . . . . .	88

## **5 Differentiating in Response to Student Readiness. . . . . 91**

Readiness Versus Ability. . . . .	92
Why Addressing Readiness Matters . . . . .	93
The Challenge of ZPD in the Classroom . . . . .	95
Support From Neuroscience . . . . .	96
Bridge Building . . . . .	97
The Role of Classroom Elements in Planning for Readiness Differentiation. . . . .	97
Learning Environment . . . . .	98
Curriculum . . . . .	98
Instruction. . . . .	99
Assessment. . . . .	99
Classroom Management. . . . .	101
Some Guidelines for Differentiating in Response to Student Readiness . . . . .	101
Content, Process, and Product Differentiation Based on Student Readiness. . . . .	105
Content . . . . .	105
Process . . . . .	107
Product . . . . .	107
Learning Contracts and Tiering for Differentiation . . . . .	108
Learning Contracts. . . . .	108
Tiering. . . . .	110
<i>Exercise 5.1</i>	
<i>Questions for Teachers About Differentiating Instruction Based on Student Readiness</i> . . . . .	114
<i>Exercise 5.2</i>	
<i>Activities for Differentiating Content, Process, and Product Based on Student Readiness</i> . . . . .	117

## **6 Differentiating in Response to Student Interest. . . . . 121**

Attend to Student Interest . . . . .	122
Why Student Interests Matter. . . . .	124
Neuroscience and Interest . . . . .	125

Seven Themes for Addressing Student Interest in the Classroom . . . . .	127
The Role of Classroom Elements in Planning for Interest-Based Differentiation . . . . .	129
Learning Environment . . . . .	129
Curriculum . . . . .	130
Assessment . . . . .	130
Classroom Management. . . . .	131
Guidelines for Differentiating in Response to Student Interest . . . . .	131
Guidelines for Differentiating Content, Process, and Product Based on Student Interest . . . . .	135
Content . . . . .	136
Process . . . . .	137
Product . . . . .	137
Guidelines for Differentiating With Expert Groups and Sidebar Studies . . . . .	138
Expert Groups . . . . .	138
Sidebar Studies. . . . .	140
<i>Exercise 6.1</i>	
<i>Questions for Teachers About Differentiating Instruction Based on Student Interest . . . . .</i>	<i>143</i>
<i>Exercise 6.2</i>	
<i>Activities for Differentiating Content, Process, and Product Based on Student Interest . . . . .</i>	<i>146</i>

## **7 Differentiating in Response to Student Learning Profile . . . . . 149**

The Aspects of Learning Profile. . . . .	149
Learning Styles . . . . .	150
Intelligence Preferences . . . . .	151
Culture . . . . .	153
Gender . . . . .	155
Learning Profile: An Evolving Concept . . . . .	158
What Neuroscience Research Says About Learning Profile . . . . .	160
What a Learning Profile Should and Shouldn't Mean . . . . .	161
Some Guidelines for Differentiating in Response to Learning Profile . . . . .	163
Differentiate Content, Process, and Product Based on Learning Profile. . . . .	166
Content . . . . .	167
Process . . . . .	169
Product . . . . .	170
Differentiate With Synthesis Groups and Thinking Caps . . . . .	170
Synthesis Groups . . . . .	171
Thinking Caps. . . . .	172
An Additional Thought . . . . .	174
<i>Exercise 7.1</i>	
<i>Questions for Teachers About Differentiating Instruction Based on Student Learning Profile . . . . .</i>	<i>176</i>

**8 Managing a Differentiated Classroom . . . . . 179**

- A Common View of Classroom Management . . . . . 179
- An Alternative View of Classroom Management . . . . . 181
- Eight Principles of Leading Students . . . . . 184
- Beginning to Lead . . . . . 186
- Helping Students Examine Their Learning Differences . . . . . 188
  - Graphing Strengths . . . . . 189
  - Trying It on for Size . . . . . 190
  - Visiting the Doctor . . . . . 190
  - Making Paper People . . . . . 190
- Helping Students Think About Differentiation . . . . . 190
- Some Guidelines for Managing a Differentiated Classroom . . . . . 193
  - Use Anchor Activities . . . . . 193
  - Consider Using Assigned or Home-Base Seats . . . . . 194
  - Set Basic Parameters . . . . . 194
  - Develop Methods for Assigning Students to Groups . . . . . 195
  - Develop Methods for Giving Directions for Multiple Tasks . . . . . 196
  - Develop Procedures for Students to Get Help When the Teacher Is Busy . . . . . 197
- Leading and Managing Successfully . . . . . 197
- Exercise 8.1*
- Some Guidelines to Ensure Effective Group Work . . . . . 199*

**Epilogue . . . . . 201**

**References and Resources . . . . . 203**

**Index . . . . . 219**

© Hawker Brownlow Education

# 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.

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,

---

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

---

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