
Preface

There are many reasons why a sequel to the popular *Building the Reading Brain, PreK–3* (Nevills & Wolfe, 2009) is necessary. Most obvious is the fact that the initial book culminates with third grade. Together, *Building the Reading Brain* and *Build the Brain for Reading* provide administrators, teachers, parents, and other professionals a composite look at the development of the brain for reading at each crucial stage. Children learn to read in the early elementary years and spend the remainder of their school years and their adult lives *reading to learn*.

Certain features of this book make it ideal for teachers and parents who work with older students and also make it unique. *What can you tell your students about . . .* sections provide a steady progression of what students can be told and what they can talk about to understand their own developing brains, encouraging them to become responsive and responsible learners. Students are empowered to partner with their teachers to learn and to know how to use their class and study time efficiently. Another helpful feature is the expanded use of tables and figures. Together with a talented friend, Herbert Higashi, the author was able to broaden information from the text through a variety of pictorial and chart related visuals. Their partnership illustrates the powerful thinking that comes from collaborative projects for adults as it does for children. Teachers can copy figures that provide pictures of the human brain to deepen understanding, or they can use tables to support learning, such as Table 8.2, Instruction for the Complex Nature of Reading Comprehension.

Is there a need for neuroscientists and educators to become partners? Is there a need for educators to know how their students learn and how they can orchestrate the learning environment to capture students' involvement and increase learning potential? With the world population advancing in knowledge, skills, and technology at exponential speed, working together is one sure way to obtain a greater understanding of our student population. A system of education that reflects how students learn can offer its students the best education possible to prepare them for a future with unpredictable demands on its future adult society.

Current, cutting-edge neurology is infused into every aspect of this book. Teachers and neurologists working together have identified a new field of study, neuroeducation. Although we are not completely adept at communicating and understanding how we each approach our work, there are some exciting outgrowths of the initial attempts to work together. Educators must exercise caution when they examine results from studies that use brain neuroimaging for classroom correlations or implications. When the same results are seen over and over again, researchers often conclude that one action causes the other. For example, recent discussion about teenagers and their behavior tends to identify the brain as the sole contributor to adolescents' good and unacceptable behavior. There is a correlation between how the brain is developing and how teens act; however, it is not proven that the developing brain causes all the behavior. Accordingly, there are neurologists who question the correlation altogether. There is a strong argument that the environment may also have a causal impact on adolescent behavior. This titillating discussion is featured in Chapter 6, *Motivation and Ability to Learn Through the Grades: How Different Is an Adolescent's Brain?*

An example of the numerous studies featured in this book is found in Chapter 9. A number of children received music training. At the end of the study, diffusion tensor imaging was used to map the brain's connective white matter. Strengthened connections among areas of the brain for auditory processing and motor skills were observed in the group that had music lessons. Some would take this information to mean music training could improve reading performance, because auditory processing, a major task of successful reading, was observed to have greater white matter connections. That response could be surmised, but it is not proven by a singular study. These results should be replicated for other visual and performing arts lessons. Increased connections in the auditory parts of the brain could be the result of any performing arts venue that has the potential to increase student attention, rehearsal, practice, and performance.

First and foremost in teachers' minds is the question, So what do I do about that in my classroom? There is a plethora of practical and easy to use teaching strategies, prompts, projects, and sample ideas for teaching units beginning in Chapter 3. All examples and suggestions feature efficient and effective teaching strategies reflective of neurologists' reports on the learning brain. Major research findings are abundant. An exhaustive reference section is provided for inquisitive readers to further their knowledge base. This combination of neurology and education helps educators grasp how and why students learn and realize that all students learn in personally unique ways that can be met in the regular classroom. Teaching suggestions are based on a standard curriculum with materials that are available in classrooms everywhere. Of crucial importance are the decisions teachers make for what to teach,

how much depth or information and concepts to teach, how long to practice, and how to maximize learning through student engagement.

Four different assessments are available. The opening chapter invites teachers to do a self-assessment of classroom practices. The ideal classroom for a primary student differs greatly from the classroom needs of the upper elementary student. Add the pre-teen's needs based upon a developing brain, and specifications for the ideal classroom environment changes again. Finally, it is accepted that the adolescent's learning needs are closer to the needs of an adult than to that of a child. So, what are ideal characteristics of a classroom designed for the non-idyllic needs of high school students?

A student assessment in Chapter 7 helps them to understand overconfidence in what they think they have learned and how they can better develop a deep understanding of the topics they are studying. Research indicates that most students tend to think they know more than they actually do, which creates a problem for students when they take an exam. Neuroscience has an explanation for this situation and a solution for students to practice. Another assessment for students is found in the final chapter. The questionnaire looks at how students respond when they are exposed to ideal, brain-compatible teaching environments versus when the environment is not ideal. Students provide answers in focus groups at school or individually at home. The responses help all teachers understand how their teaching styles affect the learning attitudes of their students. Actual responses from students in the upper elementary and middle school grades are given for teachers to identify student comments that could represent the teaching environments they provide for their students. Teachers can also help students understand critical thinking, and lead them through an assessment of their skills in Chapter 7.

Teachers of all subject areas will find new and innovative teaching ideas. While initial chapters bring the brain into focus, subsequent chapters cover how the ability to read develops. As students become dependent on reading for learning, the impact reading has on each subject becomes clear. The last two chapters address all the content areas. Chapter 9 relates information from neurology to each subject area while the final chapter gives practical neurology-based classroom strategies and resources.

We are reaching and teaching the technogeneration. So, it is fitting that brain development is matched with teaching strategies that make innovative use of media and technology. Researchers are beginning to provide reports of technology's impact on youth. What is happening to the brains of students who are growing up in a world infused with technology? How can technology become a part of classrooms in a variety of ways and for a variety of subjects? And, to what extent is the use of technology compatible with how the human brain learns? These and a host of other questions are addressed as the fields of neurology, education, and technology are infused in Chapters 7, 9, and 10.