

## A FORMATIVE ASSESSMENT

When I ask teachers to name the biggest obstacle to good teaching, the answer I most often hear is "my student" . . . Criticizing the client is the conventional defense in any embattled profession and these stereotypes conveniently relieve us of any responsibility for our students' problems—or their resolution.

—Parker Palmer, *The Courage to Teach*

**W**hether unconsciously or consciously, you bring to your reading of this book prior knowledge in mind, brain, and education (MBE) science. This knowledge could have emerged from your own educational experience, professional development, or reading selections. Prior knowledge is critical to learning. The brain likes to connect incoming information with information and experiences already stored in its long-term memory. However, it is also important that this knowledge is accurate. In the field of MBE, neuromyths abound and are unfortunately informing how teachers teach.

When beginning a new unit, or in this case a book, it is critical to find out what the audience already knows; this is something we often do with our students. Therefore, since this book is about translating research in how the brain learns to the instructional practice of educators, it is only fitting that before we take a deep dive into the research and strategies, that you take a nonthreatening assessment of what you already know about the learning brain.

One of the most underutilized yet critical teaching and learning strategies that MBE science validates is formative assessment. Providing students more frequent, nonthreatening, or low-stakes, feedback on their understanding is critical to memory consolidation. Yes, we are actually saying that we should provide students more frequent assessments. For example, as history and science teachers, we want to know what prior knowledge our students bring to our classes, and we also want to give them the best tool possible to help them store important information in their memory. As a result, we begin every unit with a formative assessment or pretest. It is therefore our hope that each reader takes the opportunity to gauge his or her current knowledge and prepare his or her brain for a deep-dive into the application of MBE science. By going to [www.thectl.org/neuroteach](http://www.thectl.org/neuroteach), you can complete the assessment shown below, as well as see the current aggregated scores of all readers.

It might seem counterintuitive to commence a book that is arguing for the next frontier for teacher training with a "traditional" true/false quiz. But it only looks like this; think about how we are using it. You are not being graded. The goal of this formative assessment is to help everyone learn and this quiz is priming your brain for what's coming in future chapters of *Neuroteach*. As this book will argue, in order to enhance a student's ability to secure into his or her long-term memory essential content determined by the Common Core, a school board, or classroom teacher, we must know what prior knowledge that student has. We are interested in learning what prior knowledge each of the readers of *Neuroteach* has before diving deeper into the book's content.

We also use formative assessments in the middle of a unit to give each of our students feedback on what they actually now know and what they do not know to help guide the studying they will do next, and also to give us feedback to adjust our teaching. Getting this feedback improves both learning and teaching. In this spirit, go to [www.thectl.org/neuroteach](http://www.thectl.org/neuroteach) at any point you like to test and refresh your knowledge (as well as check how well you did if you filled out the paper version below). We will use your anonymous answers to help guide our future work.

Respond to each statement below with "T" for true or "F" for false:

- \_\_\_\_\_ 1. The more a teacher knows about neuroscience, the more differentiated his or her instruction will be.
- \_\_\_\_\_ 2. Students should be praised for their intelligence, not their effort.

- \_\_\_\_\_ 3. The ability of the brain to change stops around the age of sixteen.
- \_\_\_\_\_ 4. Human brains seek and often quickly detect novelty.
- \_\_\_\_\_ 5. Humans use about 10 percent of their brains.
- \_\_\_\_\_ 6. Integrating the arts into the curriculum enhances learning and understanding.
- \_\_\_\_\_ 7. Informing students before an assessment that they will receive feedback/results sooner lessens their performance.
- \_\_\_\_\_ 8. Providing students opportunities to self-correct wrong answers enhances retention of information.
- \_\_\_\_\_ 9. Spaced instruction and studying enhance long-term memory consolidation better than mass instruction and review.
- \_\_\_\_\_ 10. There are brain differences by race.
- \_\_\_\_\_ 11. Listening to music with words while studying enhances a student's ability to learn material.
- \_\_\_\_\_ 12. A student's emotions affect learning, memory, and recall of information.
- \_\_\_\_\_ 13. Frequent, ungraded, formative assessments enhance memory consolidation.
- \_\_\_\_\_ 14. Multitasking reduces memory consolidation.
- \_\_\_\_\_ 15. Some students are left-brained and some students are right-brained.
- \_\_\_\_\_ 16. Regularly changing the decorations and/or organization of a classroom enhances attention.
- \_\_\_\_\_ 17. Individuals learn better when teachers teach and assess in their preferred learning styles.
- \_\_\_\_\_ 18. In a class period, the information that is delivered first is what students remember best and the information that comes last is what the students remember second best.
- \_\_\_\_\_ 19. Sleep enhances memory consolidation.
- \_\_\_\_\_ 20. Learning is enhanced by challenge and inhibited by threat.
- \_\_\_\_\_ 21. Having students memorize information is an outdated instructional strategy.
- \_\_\_\_\_ 22. Providing students choice in their learning enhances engagement and deepens learning.
- \_\_\_\_\_ 23. Brains are able to multitask.
- \_\_\_\_\_ 24. The more teachers understand principles from educational neuroscience, the more they will believe in a student's ability to improve their academic performance.

We do not give pop quizzes that can impact the grade. Research says they do not help learning; research also says that formative assessments do. In John Hattie's book *Visible Learning*, which analyzes and ranks over eight hundred meta-analyses of studies relating to student achievement, "providing formative assessments" ranks the third-highest out of 815, and ranks the highest out of things in the domain of the teacher.<sup>1</sup> So we made the switch.

Part of the power of formative assessments is that they address "if you don't use it, you lose it" in a low-stakes way. Students need to use knowledge soon after encountering it to help them store it in their long-term memory. The act of trying to recall also helps memory storage. Spaced studying helps memory storage. Stress can impede memory storage and recall. All these factors, informed by MBE research, support our decision. As teachers, we found this to be a very simple and very effective switch to make. We have tried it in our classrooms, and it works. We have sought feedback from students about the change, and it works. We have spread the word to colleagues, sought their feedback, and it works.

What is more, this is good for all students, the high fliers, the "just fine kids," and the ones who are struggling, because it both helps students learn and helps them learn more in less time. Think, for example, of a student in the midst of law school or med school—wouldn't this be good for them? Knowing to create their own formative assessments as a study strategy to grow and guide their learning in a time-efficient way has to be good. And the confidence that comes from knowing they have this tool is powerful too.

If a teacher ever gives a pop quiz, he or she needs this book. If a teacher ever begins class by going over homework, he or she needs this book. If a teacher ever advises students to study for a test by primarily reading over their notes or their textbook, he or she needs this book. But this book is also written with school leaders and parents in mind—it is a guide for accountability. This is what research says is good teaching, and it is a research-informed do and do not list.

How does your child's teacher or your child's school measure up? Are they the educational equivalent of sending your child to a doctor who attempts to treat patients with leeches? The emerging new definition of teaching excellence, based on a convergence of ideas from neuroscience, cognitive science, psychology, and educational research, is all about the quality of the teacher, the quality of the school leadership, and the quality of the professional development—this book, this checklist, is how we begin, en masse, to demand it.

Without looking back from this page, what are the *three* most salient points you take away from this chapter of *Neuroteach*?

What are *two* things you would like to do “tomorrow” with the information you learned from reading this chapter?

What is *one* question you have after reading this chapter?

#### NOTE

1. John Hattie, *Visible Learning: A Synthesis of over 800 Meta-Analyses Relating to Achievement*, first edition (London and New York: Routledge, 2008).