



ASCD Study Guide: Teaching Students to Drive Their Brains

The Learning Brain & Making Sense of Metacognition

By Donna Wilson and Marcus Conyers





Explicitly teaching students that (1) learning changes the brain to support learner motivation and positive teacher expectations, (2) metacognition empowers them to monitor and adjust their learning progress, and (3) cognitive strategies improve their learning across contexts, can lead to a cycle of higher motivation and student learning in ways that help all students reach more of their potential.

This study guide and video featuring teachers implementing our “Drive Your Brain” approach is designed for nations, states, professional learning communities, and teachers who seek to support the learning and achievement of all students.

Introduction

This guide has been created to enrich your application of these research-based, practical, and original ideas for teaching metacognition. The Drive Your Brain® component is just one aspect of our popular BrainSMART® approach to teaching and learning.

This guide is not meant to cover all elements of the video but rather to emphasize key aspects that teachers have found useful: why it is important to teach using these ideas and strategies and how you can teach using our approach. We have found that teachers’ insights about their own learning have been quite powerful. Consider, for example, the following testimonials: “I can still learn important, life-changing things!” “Metacognition is a game changer for me, too.” “I love sharing this positively transformational approach with my students!”

You can use this study guide on your own, or you can pair with a colleague or form a study group. Teachers often enjoy sharing insights and lessons they have learned with colleagues to help students become more independent thinkers and learners.

Educators who want to implement this positive and practical approach to teaching metacognitive strategies might want to also read the book, *Teaching Students to Drive Their Brains: Metacognitive Strategies, Activities, and Lesson Ideas*, found on the ASCD website at www.ascd.org/drivetheirbrains.

The study guide includes a list of supporting resources to supplement, if you wish, your learning, and a series of guiding questions to help you reflect and apply that learning. Because the learning brain and metacognition are separate, but interlocking concepts, this guide addresses them independently, so that we can drill down into their specific details. Participants also will be delighted to learn that most of the supporting resources are available online. While the video was filmed in an elementary school, teachers can use most of the supporting resources across all grade levels and subjects.

The Learning Brain

Students—especially those with learning challenges—are more motivated to take charge of their learning when they understand their amazing potential to learn at school and across other contexts. After learning some cognitive strategies and how to use metacognition, one Texas third grader said, “From now on, I’m going to be the boss of my brain.”

An original formula that we use for teaching the “Drive Your Brain” approach for learning more effectively is “Process x Content = Results.” In the video, Marcus describes this formula using the author’s metaphor: the classroom content as the content road. Wherever you start along the content road, the metacognitive and cognitive strategies we teach in this approach support students so that they can successfully master the content and then internalize how to learn.

In the video, Donna first models one approach for teaching children about their brains. Students are encouraged to learn about brain plasticity—simply defined as the brain’s ability to change as a result of learning. Because children are inclined to take learning seriously, they are inspired to discover interesting knowledge about the brain and how to enhance learning. Teaching students about how the brain changes during learning can also inspire educators as they see how much students enjoy realizing their tremendous capacity to learn.

Supporting Resources

If you’d like to delve more deeply into the topic of the learning brain, check out the following materials:



Articles:

“Engaging Brains: How to Enhance Learning by Teaching Kids About Neuroplasticity” discusses how educators who use our methods are teaching students across primary through secondary grades about neuroplasticity (brain plasticity).

<http://donnawilsonphd.blogspot.com/2017/09/engaging-brains-how-to-enhance-learning.html>

“Building a Metacognitive Classroom” shares how real teachers use our strategies and lesson ideas for K-12 to help students understand how smart they can become.

<http://donnawilsonphd.blogspot.com/2018/03/building-metacognitive-classroom.html>



Short Videos:

Welcome Video & Brain-Based Teaching Fact #1 shows a version of the “brain connections” model Donna shares in the Episode 1 video that includes neurons, dendrites, axons, and connections.

<https://www.youtube.com/watch?v=dPVxLRHBNMs&frags=pl%2Cwn>

Hand Model of the Brain describes a three-part brain model that pairs well with the hand model Donna shares in the Episode 1 video.

<https://www.youtube.com/watch?v=gm9CIJ74Oxw>



ASCD Book:

Chapter 2, Metacognition and the Learning Brain, in *Teaching Students to Drive Their Brains: Metacognitive Strategies, Activities, and Lesson Ideas* (ASCD, 2016)

Guiding Questions

After watching the first half of the video, use the following questions to reflect on what you have learned:

1. What does the term *brain plasticity* mean?
2. Why should we teach students about brain plasticity and their potential to learn at school and across other contexts of life?
3. Consider these two questions about Donna's modeling: Why do you think she first offers some ways she thinks her brain is brilliant? Why do you think she then facilitates a group conversation giving all students ample time to share?
4. Depending on your students' characteristics and the grade level and subjects you teach, as well as your teaching preferences, do you think you might use some of the tools Donna models in the video? If so, which ones?
5. Do you have other ideas for how you might teach your students about their brains and potential to learn?
6. Why do you suppose Donna mentions many ways to be smart across vastly different contexts? Why should we help students connect what they are studying about the brain to what they are learning at school and outside of school?
7. Why do you think students might enjoy learning that connections in each of their brains make them unique individuals?
8. Why do you think it is important to give students brain breaks?
9. How does Donna model the building of brain breaks into lessons?
10. What are some ways that Donna models the use of movement in the classroom?
11. What are your thoughts about your own learning potential after studying this approach so far?
12. As you reflect on the video and any supporting materials you reviewed, what ideas, lessons, and strategies might you use to teach students about their brains and potential to learn?

Making Sense of Metacognition

Metacognition is thinking about one's thinking, with the goal of enhancing learning.

In the second part of “The Learning Brain and Making Sense of Metacognition” video, Donna models how our Drive Your Brain lessons can make metacognition engaging and practical. As noted above, this approach includes teaching students about their brain’s plasticity and potential and explicitly teaching them metacognitive and cognitive tools for success across contexts. The synergy of these elements that comprise our Drive Your Brain approach makes it appealing to students and teachers alike!

Why Is Metacognition Important?

In countries around the world, current standards emphasize that students should learn metacognitive strategies. Metacognition has a solid and growing research base that suggests it is an essential skill for successful learners and high achievers. Therefore, teachers must be supported to guide students to use this powerful and practical tool so that all students can become better thinkers and learners.

In a meta-analysis of 91 studies, Wang, Haertel, and Walberg (1993) determined that metacognition is the number one student characteristic of high academic achievers. More recently, on a list of 150 factors that influence student achievement, metacognitive strategies were ranked 15th; by comparison, student socioeconomic status was ranked 45th (Hattie, 2012). Other research supports both the importance of metacognition for learning across contexts, and a wide body of evidence supports that metacognitive strategies can be taught and learned (Bransford, Brown, & Cocking, 2000; Efklides & Misailidi, 2010; Hacker, Dunlosky, & Graesser, 2009; Hartman, 2002).

Although educational research on the power of metacognition for increasing student learning and achievement has been amassing for several decades, scientists have only recently begun to pinpoint the physical center of metacognition in the brain. Researchers at the University College London (UCL) have discovered that subjects with better metacognition had more gray matter in the anterior prefrontal cortex. Studies are ongoing to determine just how this brain area contributes to the critically important skill of metacognition. Stephen M. Fleming, lead UCL researcher in this effort, writes that metacognition may just be the number one key to higher achievement across all domains.

Despite the wealth of research on the importance of teaching metacognition, the focus of practice in the United States continues to be primarily on content knowledge. Baker (2013) writes that “metacognitive strategies instruction is still not commonly observed in most primary and secondary classrooms, and interviews with teachers have revealed limited knowledge about metacognition and how to foster it.” A major study of lessons taught in hundreds of elementary classrooms found that, on average, fifth graders received 500 percent more instruction on basic skills than on higher-order thinking skills; the ratio for first and third graders was 10:1 (Pianta, Belsky, Houts, & Morrison, 2007).



Guiding students to recognize that they can learn these vital skills and improve them over time provides a pathway to achieve the goals they set for themselves in school and in life. Among the most vital and versatile skillsets that we can teach students to develop are the abilities to think about their learning, to be aware of factors that affect their intellectual performance, to know how and when to use cognitive strategies, and to monitor and adjust their performance of learning tasks.

All these abilities fall under the umbrella of metacognition. Teaching students to become more metacognitive equips them with skills to “drive their brains,” to become self-directed learners. They can and should start learning about metacognition at an early age and apply this knowledge and related strategies across all core subjects and in life. (Feel free to use the two-color sheets at the end of this study guide to introduce the Drive Your Brain concept to very young students.) Explicit instruction provides the “why” and the “how” for students to become aware of their learning, to name and regulate it, to learn from their experiences, and to become expert learners as they master metacognition and supporting cognitive strategies, or what we call cognitive assets.

Tips for Guiding Students to Become Metacognitive Learners

When teaching students to become independent learners by discovering how to use metacognition, follow these important guidelines:

- First teach students about the power of their brilliant brains and how brains change during learning;
- Introduce the term *metacognition*, define it, discuss it, and use it often;
- Begin with an explicit lesson using metacognition;
- Use metaphors to explain and explore the use of metacognition;
- Notice students using metacognition and recognize them; and
- Lead discussions that encourage students to share examples of the use of metacognition across academic content areas and in contexts outside of school.

Supporting Resources

If you’d like to delve more deeply into the topic of metacognition, check out the following materials:



Articles:

“Metacognition: The Gift That Keeps Giving” shares five strategies to create classrooms where students learn to think at higher levels through the use of metacognition.

<http://donnawilsonphd.blogspot.com/2017/10/metacognition-gift-that-keeps-giving.html>

“5 Strategies for Teaching Students How to Use Metacognition” argues that students can and should start learning about metacognition at an early age and then apply it across all content areas and in life lessons.

<https://www.teachthought.com/learning/5-strategies-teaching-students-use-metacognition/>

“A Skill Strong Readers Share” discusses metacognitive reading tools that students can learn to use before and during reading.

<https://donnawilsonphd.blogspot.com/2018/02/a-skill-strong-readers-share.html>

“Move Your Body Grow Your Brain” discusses the importance of movement in maintaining the body-brain system and provide strategies for ensuring students move during the school day.

<http://donnawilsonphd.blogspot.com/2017/04/move-your-body-grow-your-brain.html>

“It’s an Exciting Time to Be an Educator” shares a big picture view of current inspiring research and opines that today is an exciting time to be an educator as research in the learning sciences paves the way for educational innovations.

<http://donnawilsonphd.blogspot.com/2017/12/new-ed-week-blog-post-its-exciting-time.html>

“The Forgotten Secret to Leadership Success” reviews the importance of metacognition for educational leaders and offers some strategies to support mindful, forward-thinking leadership.

<http://donnawilsonphd.blogspot.com/2017/02/marcus-conyers-and-i-reveal-forgotten.html#more>



ASCD Book:

Chapter 2, Metacognition and the Learning Brain, in *Teaching Students to Drive Their Brains: Metacognitive Strategies, Activities, and Lesson Ideas* (ASCD, 2016)

Guiding Questions

After watching the second half of the video, use the following questions to reflect on what you have learned:

1. What is metacognition, and how do you think it assists people to think and learn more effectively? In your opinion, how is mindfulness similar *and* different from metacognition?
2. What are the benefits of a practical metacognitive approach to teaching students to use metacognition and key cognitive skills?
3. Why do people need to use effective thinking practices more today than ever before?
4. Why do you suppose teachers have found the “drive your brain” metaphor helpful for teaching students to apply the concept of metacognition?
5. Self-monitoring is a key component of metacognition. In the video, Donna presents an extended metaphor on how self-monitoring can help students steer their “brain cars” to optimize learning. How can you apply these ideas in your lessons? Can you think of other metaphors and examples to help illustrate the importance of self-monitoring for your students?
6. After watching the video and reviewing any supporting resources, which ideas might you employ to introduce metacognition to the students in your classroom?



References

- Baker, L. (2013). Metacognitive strategies. In J. Hattie & E. M. Anderman (Eds.), *International Guide to Student Achievement*. New York, NY: Routledge.
- Efklides, A., & Misailidi, P. (Eds.). (2010). *Trends and prospects in metacognition research*. New York, NY: Springer.
- Fleming, S. M. (2014, September/October). Metacognition is the forgotten secret to success. *Scientific American*, 27(15), 31–37.
- Hacker, D. J., Dunlosky, J., & Graesser, A. C. (2009). *Handbook of metacognition in education*. New York, NY: Routledge.
- Hartman, H. J. (2002). *Metacognition in learning and instruction: Theory, research, and practice*. New York, NY: Springer.
- Hattie, J. A. C. (2012). *Visible learning for teachers: Maximizing impact on learning*. New York, NY: Routledge.
- Pianta, R., Belsky, J., Houts, R., & Morrison, F. (2007, March 30). Opportunities to learn in America's elementary classrooms. *Science*, 315, 1795–1796. doi: 10.1126/science.1139719

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For more than two decades, Donna Wilson and Marcus Conyers—cofounders of BrainSMART, Inc. and the Center for Innovative Education and Prevention—have been pioneers in bridging brain science and cognitive psychology to educational practice.

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