

THE BRAIN-BASED LEARNER

Translating neuroscience and behavioral sciences... for optimal learning

Published the 1st and 15th each month

Copyright: Debbie McLaughlin, owner/publisher, <https://brainbasedlearner.com/>; debbie@brainbasedlearner.com

May 1, 2023

Variability in thinking speed

[Click the title for the audio version](#)



Barbara Oakley

Oakley is a professor of engineering at Oakland University and the author of several books, including the 2021 [Uncommon Sense Teaching: Practical Insights in Brain Science to Help Students Learn](#). Co-authored with Beth Rogowsky and Terrence Sejnowski, the book filters insights from neuroscience into practical strategies for teachers and students. A stroll around Oakley's website shows the breadth of her interests. I'm fascinated by her journey from training in electrical, computer, and systems engineering into her deep dive into "the complex relationship between neuroscience and social behavior."

It's worth taking a little space for Oakley's personal story—if for no other reason than to remind us that early failures don't doom us or our students, and that students can ask a question that changes one's trajectory. Oakley flunked her way through math and science, all the way through high school. Fast forward to teaching engineering, and one day a student asks her, "How did you change your brain?" She began her quest to truly answer that question. A quick Google search of Barbara Oakley will turn up many videos & interviews. Here is just one, a transcript and link to her talk "[Learning How to Learn](#)" at [TedXOaklandUniversity](#).

Questions to ask yourself or to share in a school-based discussion.

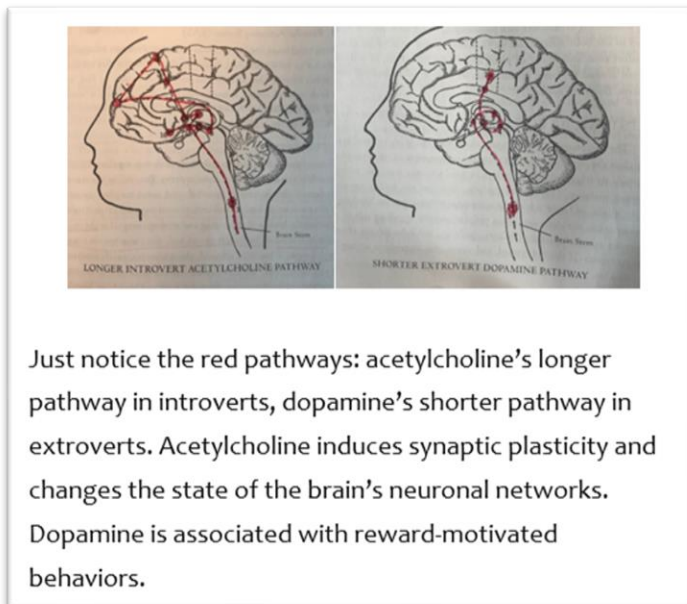
1. Does school in general, and your classroom in particular, favor quick thinkers or slower thinkers?
2. Which learning activities rely on or require focused mode? Which require diffuse thinking? Is there enough time allotted for diffused thinking?
3. Oakley says that shy, quiet learners can be slower learners, but they are actually the most flexible thinkers, and they can be the most creative problems solvers. What do you think about that?

Variable speeds

Now to the hiker and race driver pictures...

What causes the differences in speed? As our dendrites grow, they are bathed at night—during sleep—in neurochemicals. For the slower thinkers, the “spikes” in dendritic growth are washed away, and we may need to re-learn whatever we encountered that day. Once the re-learning process occurs enough, dendrites and synapses form and take root.

Susan Cain wrote the book [Quiet: The Power of Introverts in a World That Can't Stop Talking](#). Her work and this [fascinating research](#) describes the key differences in the brains of introverts & extroverts. Dopamine and acetylcholine are powerful neurotransmitters that we all have, but that operate differently in people.



Neurotransmitters:

*one more way to understand
the variability of our learners.*

Practical advice for learners and teachers

- Build in time for students, upon learning something new, to close their eyes and summarize what was just heard or learned. They can do this in their minds' eyes, or write it down, or create a system for doing this kind of summarizing. This reminds me of [Retrieval Practice](#), which we explored earlier in the year.
- Teach students about [focused thinking vs diffuse thinking](#). Focused is when you can get started on a task and bring all your concentration to bear. Diffused thinking is when we allow our minds to wander and imagine. The brain is still working, consolidating and making sense. Toggling between these two modes will likely be necessary for each learner, but differently. If a new skill or concept is easy for one person, focused mode may be enough—but another person may need additional diffuse thinking time.
- Oakley suggests helping students identify the procedures, or patterns, or “chains” of steps to take to mastery of a certain skill or concept. This reminds me of our Knowledge Organiser (KO) issue; a KO could help scaffold and teach chaining, which will strengthen working memory and build automaticity.
- Teach learners HOW they learn, meaning, how the human brain learns. This can help them immediately AND for the long run, because they can apply this metacognition to any future thing they want to explore—thus broadening their possibilities in life.
- And... radical food for thought: Oakley claims that online learning has the potential to be a better learning experience because it removes bottlenecks that occur in a physical classroom, the main one being: the teacher's attention. **WHOA! What might this mean for weaving online pathways into our physical environment AND, how might slower thinkers benefit from this?**