Sticky Teaching

Teaching is the art of changing students' brains, but how do we focus our students' attention when they are bombarded by so much information every day? This evidence-based presentation on teaching and learning will show instructors how to compete for and win students' attention. Based on neuroscience, participants will see how mystery, novelty, sensory experience, personal relevance, and community work together to ensure student learning. Using this information, instructors can design better lessons that are remembered and applied going forward.

Steve Schmidt

Adult Education Consultant

Moderator, LINCS Reading and Writing Community

schmidtconsulting4@gmail.com

Today's Objectives

At the end of today's workshop, I will be able to:

- Explain what stimuli the brain pays attention to and why
- Discuss how mysteries, novelty, sensory experiences, spaced learning, community, and personal relevance work together to create "sticky" learning
- Describe how to structure lessons that focus student attention and ensure learning for the long haul

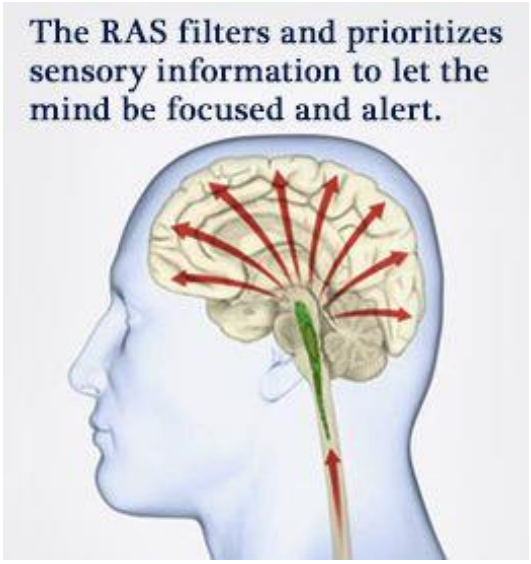
What is Sticky Teaching?

Sticky teaching:

- Engages learners
- Is understood
- Stays memorable

The Gatekeeper: Reticular Activating System

The reticular activating system (RAS) is a bundle of nerves in the brain that acts as a filter for incoming information. The brain is bombarded by the senses gathering 11 million bits of information per second from the environment. Since we cannot process all of it, the RAS acts as a gatekeeper that decides what information is processed.



What Gets Through the RAS?

Lessons that have or use:

- Mystery/novelty
- Sensory experience
- Community
- Personal Relevance
- Spaced learning
- Metaphors/Analogies

Begin Lessons with a Mystery or Novelty

"Mystery creates wonder and wonder is the basis of man's desire to understand."

- Neil Armstrong

Start with Questions – Questions demand answers. Ask questions like: How could a rag-tag volunteer army defeat the world's greatest superpower? True or False - Sometime in the last 105 years, we had a man doctors described as a "low-functioning invalid" serving as President of the United States for the last 18 months of his term.

Tell Stories – Stories are powerful. Culture has been passed down from generation to generation through storytelling for thousands of years. Tell personal stories that relate to a subject and have students relate their own stories.

Tell Jokes – Here's a joke for a solar system lesson: Question: Why didn't the sun go to college? Answer: It already had 27 million degrees!

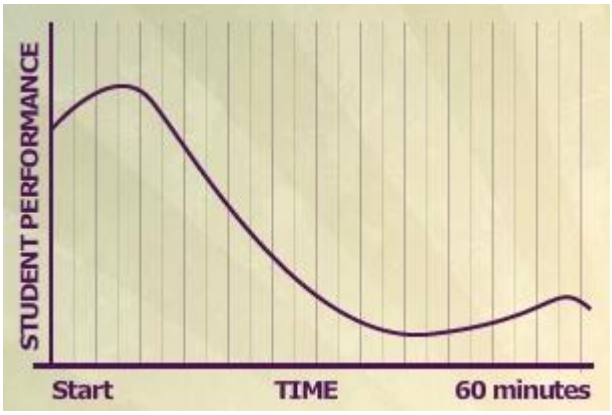
Start with an Unusual Fact or a Quote – There are more trees (three trillion!) on Earth than stars in the Milky Way galaxy (100 billion).

Wear Costumes – I saw an instructor dress like a baby to teach about infant care. Wear hats related to a lesson.

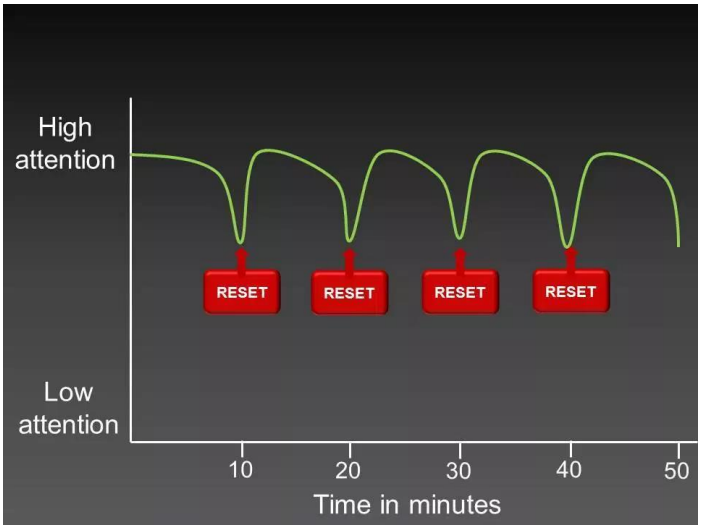
Maximize Learning Time

What happens to attention span over time?

Attention Span with No Resets



Attention Span with Resets



Students remember the most from the beginning and the end of learning situations. How can we move the beginning and the end closer together?

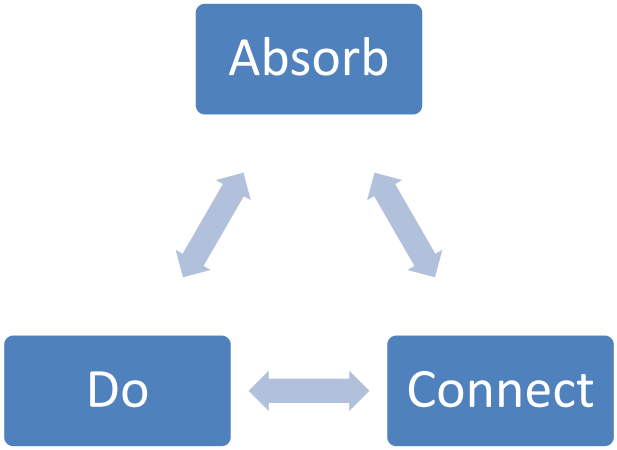
Teach with the A, D, C's: Absorb, Do, Connect

During class, cycle through periods of absorb, do, and connect:

Absorb - Learners take in information by listening, reading, or watching (keep short, no more than 10 to 15 minutes).

Do - Students do something active to apply what they are learning such as answer questions or complete graphic organizers.

Connect - Learners interact with the material and with each other.



Use Sensory Experiences (Especially Visual)

“Neuroscientists from the Massachusetts Institute of Technology (MIT) have found that the human brain can process entire images that the eye sees for as little as 13 milliseconds . . . what vision does is find concepts. That’s what the brain is doing all day long — trying to understand what we’re looking at.” - MIT News 1/16/14

Use the five senses (vision, hearing, touch, taste, smell) and movement to make learning memorable. The more senses we use, the more memorable an experience is. This can be done by:

Show Videos – Videos provide great introductions to new material and give students’ instant background knowledge. Crash Course is a popular YouTube video channel that gives overviews of different subjects.

Use Visuals – Teach with pictures, ads, comic strips, and political cartoons.

Use Color – Color attracts attention, so use it to highlight important points.

Play Music – Play jazz or big band music when teaching those time periods.

Movement – Walk backward when teaching negative numbers, past tense, or literature flashbacks. Move to different parts of the classroom when teaching. Hold class in different locations.

Use Your Voice – When reading aloud, vary the rise and fall of your voice. Pauses also create interest.

Build Community

“People are social beings and want interaction, and social learning is the primary form of learning, just as word-of-mouth advertising is the highest form of advertising.” - Stephen Covey

Learning in community strategies include:

- **Walk and Talk** - Have students walk around the room with a partner and talk about what they have been learning.

- **Circle Toss** - Have students stand up at their tables and form a circle. Toss around a ball and as each person catches the ball, they answer a question or tell something they remembered from the learning experience.

- **Snowball Fight** - Have learners write something about the lesson on a piece of paper, crumple it up, and then have them stand up and throw the crumpled paper around the room for 30 seconds. Then have students pick up one of the balls, read what is on the paper, and tell someone else about it.

- **Always/Sometimes/Never** – Put the word “always” on one sheet of paper, “sometimes” on another, and “never” on a third sheet. Place the sheets in different places around the room (or on three different places on the white board). Give students a statement based on the material they have been learning. Have students move to either always, sometimes, or never based on how they think the question or statement should be answered and explain why to someone standing near them.

- **Think/Pair/Share** - Have students stand up and do a think pair share. Ask students to stand, give them a question and then one minute to think about the answer. Then have them find a partner and both share their answers to the question.

- **Partner Share/Teach** - Turn and share a question or the answer to a question with a partner. Each partner should teach the other the material they have just been learning.

- **Talk then Write** – Students talk in small groups and then write. This can help when students face a difficult writing task and may need some group brainstorming before starting.

- **Agree/Disagree Wall** - Write on the board or have two sheets of paper where one says “Agree” and the other “Disagree.” Do an Agree/Disagree wall by first asking a question or making a statement. Students will then stand up and move to a spot close to Agree or Disagree (or they can move to the middle). Have students discuss with a partner or the whole class why they agree or disagree with the statement or question.

- **Team Games** – Play Kahoot! (kahoot.com) or Jeopardy! (jeopardylabs.com).

- **Gallery Walk** - Students display their work around the classroom on the board or on flip chart paper. Students will move with their group and look at each presentation for several minutes. The instructor will then say "switch!" and the groups will move to the next presentation.

Spaced Learning and Defeating Procrastination

"It doesn't seem like it hurts if you put off your studies a little longer. Or spend another 'few minutes' on social media. But if you get used to procrastinating, it will make learning harder, because you will have less time when you do buckle down to learn. You'll get stressed, miss deadlines, and not learn things properly. You can get really behind. All this will make you a less effective student."

- Dr. Barbara Oakley

The Brain Avoids Pain and Seeks Pleasure

- When we think about a work or study task we do not want to do, it activities the brain's pain sensors. To avoid pain, the brain tries to direct our attention elsewhere which leads to procrastination.

- Procrastination is a habit set off by a cue (I have to do some work or studying) that launches us into a routine (less painful activities the brain wants to do like check social media) that gives a reward (fun activity instead of boring work). We can reform the procrastination habit by using the Pomodoro Technique (see below).

Process vs. Product

- Process is a time period

  Example: I'll spend 25 minutes working on this lesson plan

- Product is an outcome

  Example: I'll write a new lesson plan on kinetics energy

- The brain's pain sensors are triggered by product goals, so set process goals instead

The Pomodoro Technique

- Set a timer and work/study for 25-minute periods

- Reward yourself with a 5-minute break after the timer goes off

- Take a longer break after three or four 25-minute work/study intervals

- Pomodoros space out learning and use both focused and diffuse modes

- "Eat your frogs first," do the hardest task first or during your peak focus periods

Create Personal Relevance

“The idea that we can put anything in people's heads without addressing motivation is crazy.”

- Jeff Goodman, Appalachian State University

Research shows that we can create personal relevance in several ways:

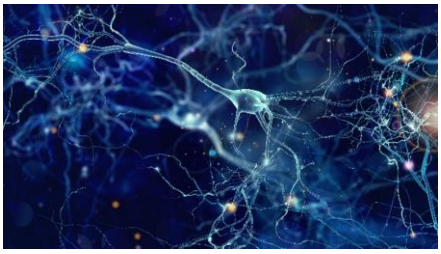
Choices - Give students’ choices about what and how they learn.

Use Real-Life Examples – Some of the most powerful lessons come from when students ask for help with real-life challenges they face.

Relate Theory to Practice – Show how the area formula is used in painting walls or how carpenters use the Pythagorean theorem.

Use Current Events – How can we relate lessons to what is happening right now in the world or our own country?

Discuss Local Examples - How does a subject relate to what is going on in your community?



Use Metaphors and Analogies

“When you are trying to learn something new, the best way to learn it is to connect it with something you already know.” - Dr. Barbara Oakley

Metaphors and analogies allow new learning to piggy back on existing neural pathways (“neural reuse”) making new concepts easier to understand. Metaphors “rapidly on-board” new ideas.

In this presentation, we used the analogy that the focused and diffuse modes are like pinball machines. We also used two sides of the same coin to show that the brain can be in only one mode at a time. Comparing the flow of electrons to the flow of water also uses this method.

Interleaved Problem Solving

Use interleaving, the technique of mixing different kinds of practice problems, to boost problem solving skills. Studies have shown that interleaved practice with math is more effective than blocked practice (giving students practice problems that involve the same strategy) (Rohrer, Dedrick, & Stershic, 2015).

Reflection

Think about what we have done today. Write (or discuss) one best practice or activity for each of the following:

What is something that:

1. Reinforced something good that I already am doing?

2. Reminded me of something I used to do and will try again?

3. Gave me a new idea that I plan to try?

About the Presenter

Steve Schmidt is an adult education consultant and moderator of the LINCS Reading and Writing Community of Practice. He has worked in adult basic education for more than 28 years as an instructor, program director, professional developer, and author. From 2010 to 2019, Steve served as a professional developer at Appalachian State University. He has delivered hundreds of workshops on a variety of topics including at COABE (2012 – 21) and for Delaware adult educators (2016, 19, 20, 21). Steve is available to do customized webinars and workshops, and he can be reached at: schmidtconsulting4@gmail.com

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