

# *Accelerated Teaching Techniques*



*Dr. Joe McCullough  
Jan. 13, 2017*

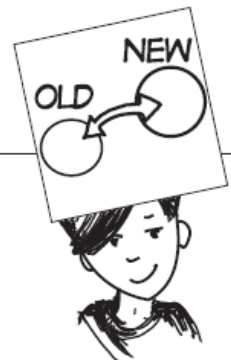
# 3 BIG Brain Ideas

**#1** There is no \_\_\_\_\_  
without \_\_\_\_\_.



*Now what?*

**#2** Students make \_\_\_\_\_ by  
connecting to existing \_\_\_\_\_.



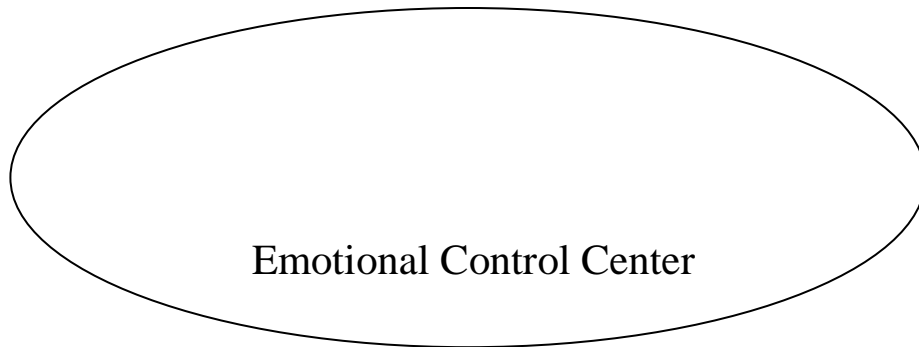
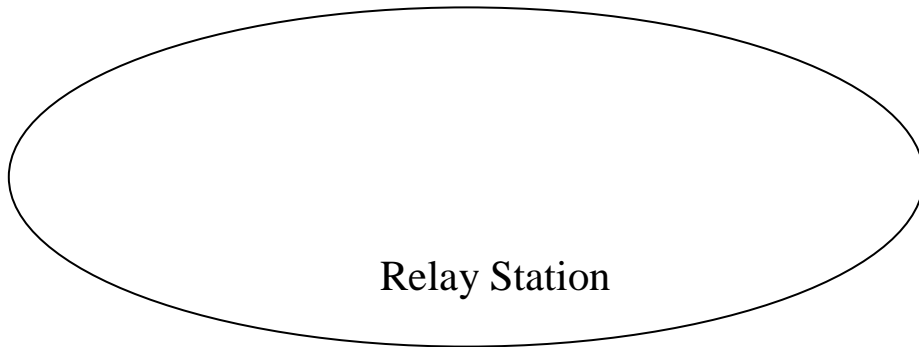
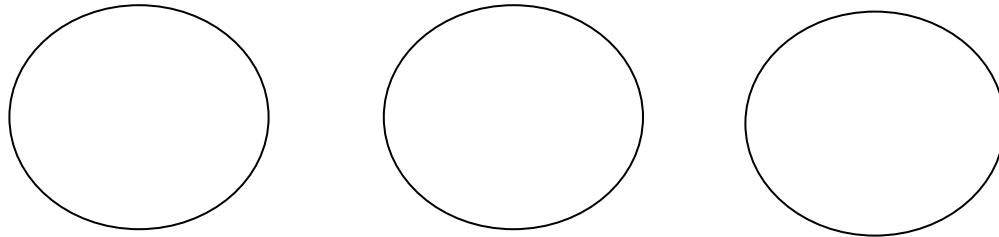
*Now what?*

**#3** Neurons that \_\_\_\_\_ together,  
\_\_\_\_\_ together.



*Now what?*

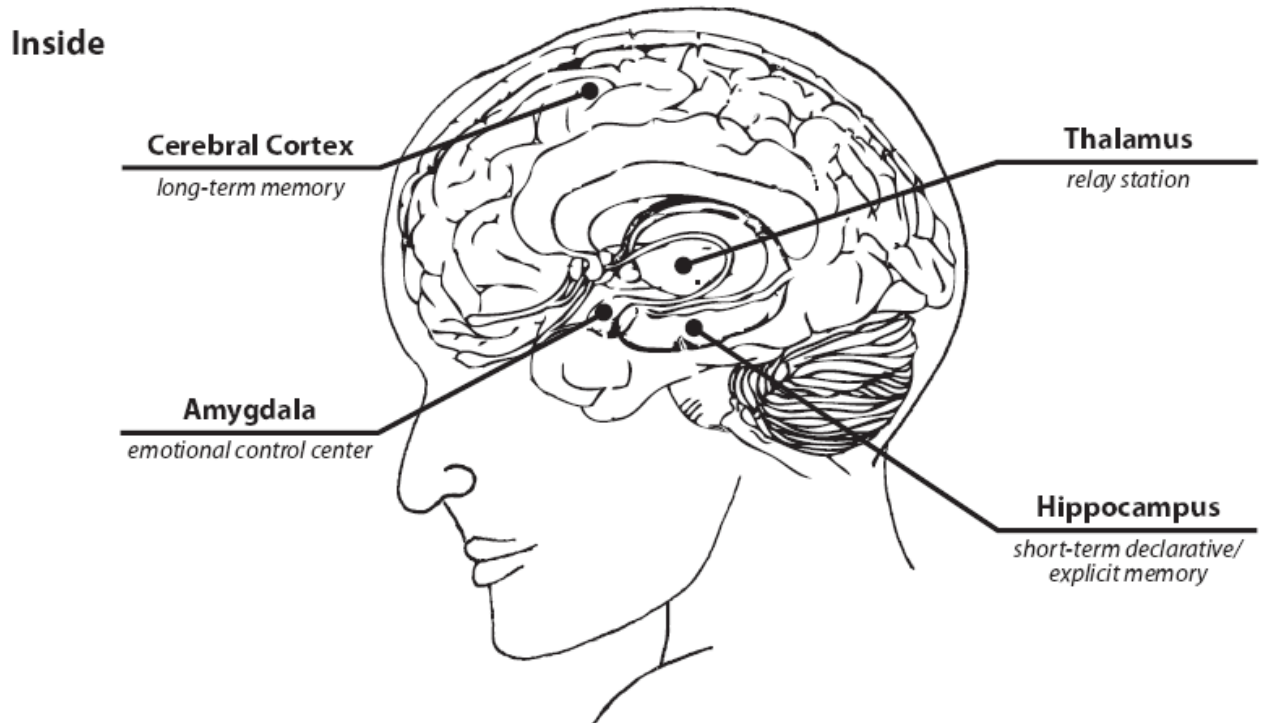
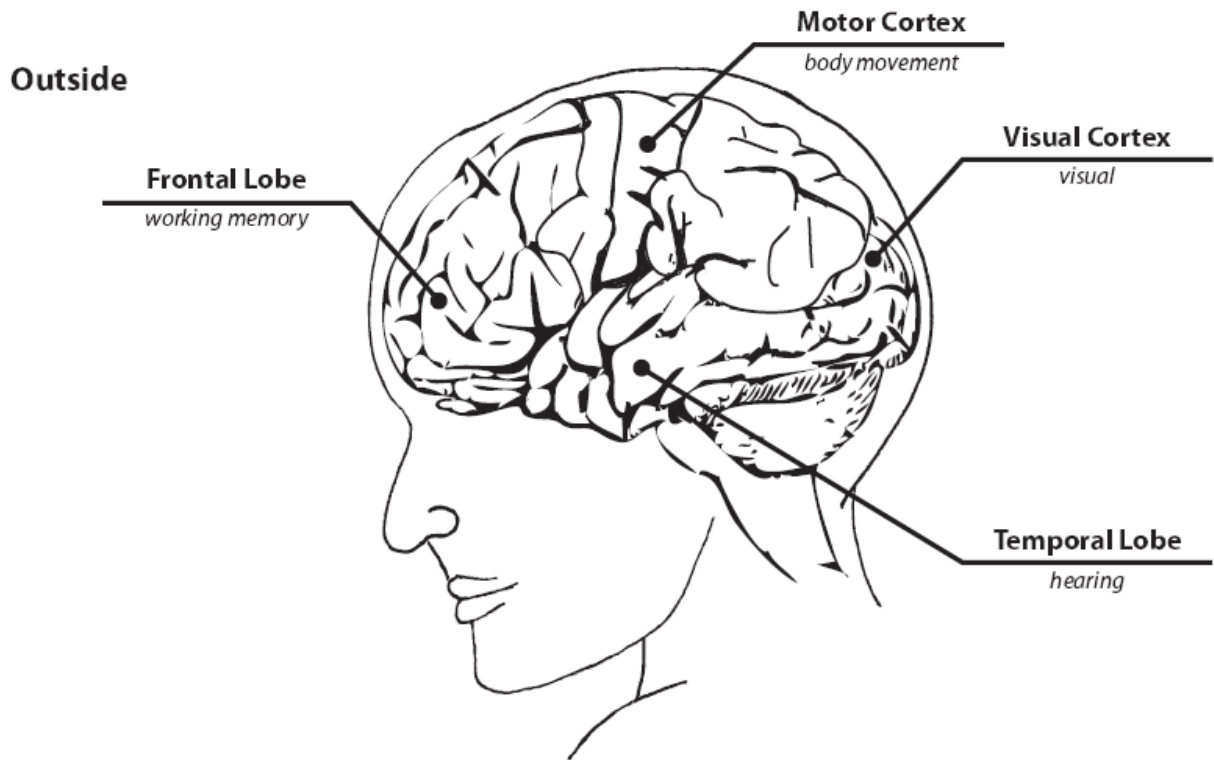
*Path of Learning and Memory / Amygdala*



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## *Path of Learning and Memory / Amygdala*



## *VAK Explanations*

### **Visual Learners:**

*Visual learners* learn best through seeing. They enjoy pictures, diagrams, written words, demonstrations, and watching videos. Visual learners tend to be strong readers, good spellers and pay close attention to a speaker's body language and facial expressions. They find it easier to remember things they see than things they hear. They are generally not distracted by noise, tend to like art more than music, prefer reading for themselves rather than being read to, and tend to memorize by visual association.

### **Auditory Learners:**

*Auditory learners* learn best through hearing. They enjoy audio tapes, discussions, and verbal instructions. They would rather listen to material presented in lecture than read the material in a textbook. Auditory learners tend to prefer talking to writing and are often easily distracted by noise. They find it easier to remember things they hear than things they see. Auditory learners usually enjoy reading aloud, tend to move their lips while reading, tend to like music more than art, and are frequently eloquent speakers.

### ***Kinesthetic Learners:***

*Kinesthetic learners* learn best by doing. They enjoy manipulating, moving, touching, and hands-on experiences where they can be directly involved. They learn best through movement and physical activities and understand things better when they act them out. Kinesthetic learners tend to speak and write more slowly, stand close when talking to someone, and touch people to get their attention. They find it easier to remember things when they are being physically active. Kinesthetic learners are usually good at sports, tend to gesture a lot while talking, tend to use action words, and often can't sit still for long periods of time.



# *VAK Teaching Strategies*

## *Visual Teaching Strategies:*

- Use color; color-code your content.
- Use flip-charts for key content and then hang the charts around the room.
- Use pictures and diagrams in your class notes.
- Encourage students to use mind maps, charts, or diagrams to visually display content. Allow time for this in class.
- Teach specific content in a specific location.
- Stand still while presenting chunks of information; move around between chunks.
- Use visual representations of content and graphic organizers.
- Provide students with the “big picture.”
- Anchor a prop to specific content.
- Show videos.
- Write information and instructions on the whiteboard.
- Use visual language: imagine ... picture ... can you see it ... it looks like ...
- Use guided imagery.
- Create projects or assignments with a visual emphasis.
- Give time for students to write things down.



*Now What?*

# VAK Teaching Strategies

## *Auditory Teaching Strategies:*

- Use music.
- Use callbacks; have students repeat key concepts and directions back.
- Provide opportunities for students to review with a neighbor or within a group.
- Teach the way you test. Auditory learners remember what was said. State information in a variety of ways so students don't think questions are "trick" questions.
- Give auditory instructions to supplement written directions.
- Use vocal variations.
- Use purposeful pauses.
- Anchor content to sounds or voices.
- Have students create a song, chant, or rhyme to remember key information.
- Let students talk.
- Use pair shares.
- Use out-loud simultaneous responses.
- Allow time to process auditory information.

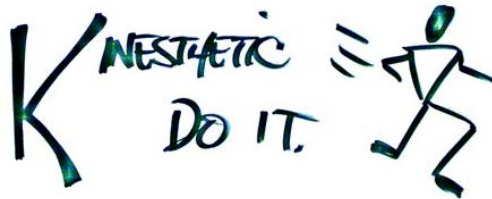


*Now What?*

# VAK Teaching Strategies

## *Kinesthetic Teaching Strategies:*

- Provide opportunities to learn by doing.
- Talk slowly.
- Create activities that involve role-playing.
- Create simulations of concepts to allow students to experience them.
- Provide opportunities for movement.
- Use proximity.
- When working individually with students, sit next to them rather than in front of or behind them.
- Create motions or gestures for key content.
- Create a dance for content.
- Create volunteer opportunities.
- Do standing reviews.
- Do standing pair shares.
- Ask students to sit up or adjust their physiology.
- Toss a ball to students to call on them to answer questions.
- Assign jobs or roles to students that involve movement (pass out papers, collect homework, etc.).
- Lead students in a quick stretch (sitting or standing).



*Now What?*



## *Path of Learning and Memory / Amygdala*

Sensory information (V, A, K) from the outside world enters the brain and is first sent to the \_\_\_\_\_. This part of the brain acts as a relay station and transfers information in \_\_\_\_\_ directions at the same time.

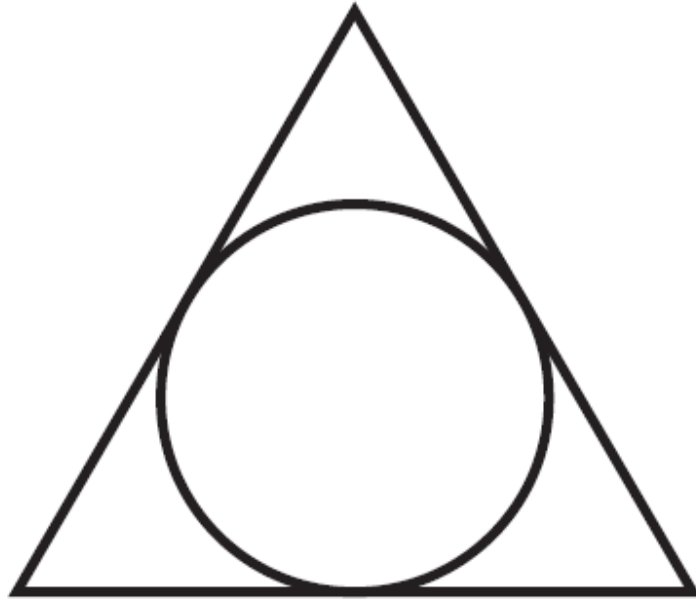
One direction is called the \_\_\_\_\_ road, where information is transferred to the appropriate \_\_\_\_\_ cortices. The sensory information then converges to \_\_\_\_\_ in the prefrontal cortex.

Working memory can only focus on \_\_\_\_\_ thing at a time. Our goal as teachers is to capture and hold \_\_\_\_\_.

The other direction that sensory information travels from the thalamus is called the \_\_\_\_\_ road, which leads to the emotional control center of the brain called the \_\_\_\_\_. This transfer happens \_\_\_\_\_. One of the responsibilities of the amygdala is to process emotions related to \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_.

When amygdala activity is high, prefrontal cortex activity is \_\_\_\_\_.  
When amygdala activity is low, prefrontal cortex activity is \_\_\_\_\_.

## *Home Court Advantage*



*Now What?*

## *Using Music in the Classroom*

### **Match the music to the activity. . .**

Choose music that matches the state or tone of the activity.

For example:

- slow music for journaling, tests, etc.
- upbeat music for come-in song, fastwriting, etc.

Choose music without lyrics when your students need to concentrate.

- The brain can concentrate on one new thing at a time.
- Lyrics may distract the brain from learning.
- If new information is being processed or learned, music with lyrics may be using valuable space in our working memory.

<p><b>UPBEAT LYRICAL</b></p> <ul style="list-style-type: none"><li>• come-in song</li><li>• moving seats</li><li>• distributing papers/supplies</li><li>• transitions</li></ul>	<p><b>SLOW/MEDIUM LYRICAL</b></p> <ul style="list-style-type: none"><li>• one-song break</li><li>• transition</li><li>• group activity not requiring focused attention</li></ul>
<p><b>UPBEAT NON-LYRICAL</b></p> <ul style="list-style-type: none"><li>• fastwriting</li><li>• group work</li><li>• project creation</li><li>• seat work</li></ul>	<p><b>SLOW/MEDIUM NON-LYRICAL</b></p> <ul style="list-style-type: none"><li>• journaling</li><li>• mind mapping</li><li>• quizzes</li><li>• tests</li></ul>

## *Using Music in the Classroom*

Music has an effect on both the teacher and the students. As the teacher, you can use music to set the mood, change student's state and support your learning environment. Students will not only perform better and remember more, it's highly likely they will love it. Music stimulates, rejuvenates and strengthens learning both consciously and unconsciously.

Research has shown that baroque (Bach, Corelli, Tartini, Vivaldi, Handel, Pachelbel, ...) and classical music (Mozart, Beethoven, Satie, Rachmaninoff, ...) can help stimulate and maintain an optimal learning environment. Baroque's steady 60–80 beats per minute, melodic chord structures and instrumentation help your body access an alert yet relaxed state (the alpha brain-wave state). Mix your baroque selections with classical music to add variety in beat, rhythm, and dynamics.

Upbeat contemporary music is great as students are coming into class and between learning sessions. It stimulates the body toward movement and changes your students' state, allowing you to literally switch gears. Points to consider when selecting: choose from a variety of contemporary artists and select music with a positive message.

Experiment and see how you can utilize music to:

- energize
- stimulate experiences
- induce relaxation
- develop rapport
- set a theme for the day
- inspire and have fun



Music is also a great way to establish traditions and make routine activities such as collecting homework more fun. For example, I use an abridged version of the William Tell Overture as my homework collection song. I play the song at the beginning of class and my students have until the end of the song (which is 1 minute and 17 seconds long) to hand in their homework. Any homework turned in after the song ends is considered late.

## *Teach Like TED*

### ***Secret #1: Unleash the Master Within***

“Science shows that passion is contagious, literally. You cannot inspire others unless you are inspired yourself. You stand a greater chance of persuading and inspiring your listeners if you express an enthusiastic, passionate, and meaningful connection to your topic.”

“How you think -- the confidence you have in your expertise, the passion you have for your topic -- directly impacts your communications presence. Thoughts change your brain chemistry, shaping what you say and how you say it.”

- ✓ *Convey your enthusiasm to your students.*
- ✓ *Give your students the BIG picture and the WHY.*
- ✓ *Consider not covering any content the first day. Get students excited for your class!*
- ✓ *Don't take attendance at the very beginning of class on the first day.*

### ***Secret #2: Master the Art of Storytelling***

“Brain scans reveal that stories stimulate and engage the human brain, helping the speaker connect with the audience and making it much more likely that the audience will agree with the speaker's point of view.”

- ✓ *Tell a personal story to connect with your students.*
- ✓ *Show your class a funny and/or embarrassing picture of you.*



### ***Secret #3: Have a Conversation***

“Practice relentlessly and internalize your content so that you can deliver the presentation as comfortably as having a conversation with a close friend.”

“True persuasion occurs only after you have built an emotional rapport with your listeners and have gained their trust. If your voice, gestures, and body language are incongruent with your words, your listeners will distrust your message.”

- ✓ *Videotape yourself several times throughout the semester.*
- ✓ *Use gestures at key moments to emphasize important information.*

#### **Secret #4: Teach Me Something New**

“The human brain loves novelty. An unfamiliar, unusual, or unexpected event in a presentation intrigues the audience, jolts them out of their preconceived notions, and quickly gives them a new way at looking at the world.”

“Learning something new activates the same reward areas of the brain as do drugs and gambling. A big part of the answer to why some of your students hold onto the information you teach and others do not have to do with the little chemical in the brain that has to be present for a child or an adult to retain information. That chemical is called **dopamine**.”

- ✓ *Increase novelty in the classroom (and you increase students’ dopamine levels).*
- ✓ *Make learning joyful and adventurous.*



#### **Secret #5: Deliver Jaw-Dropping Moments**

“Jaw-dropping moments create what neuroscientists call an emotionally charged event, a heightened state of emotion that makes it more likely your audience will remember your message and act on it.”

“An emotionally charged event is the best-processed kind of external stimulus ever measured ... Emotionally charged events persist longer in our memories and are recalled with greater accuracy than neutral memories.”

- ✓ *Purposefully create emotionally charged events (teachable moments).*
- ✓ *Capture their attention! (Use props and demos, unexpected or shocking statistics, pictures, images, video, memorable headlines, personal stories, ...)*
- ✓ *End each class on a high note.*



**Now What?**

### **Secret #6: Lighten Up**

“The brain loves humor. Give your audience something to smile about ... Humor lowers defenses, making your audience more receptive to your message. It also makes you seem more likable, and people are more willing to do business with or support someone they like.”

- ✓ *Don't take yourself too seriously.*
- ✓ *Add humor into your presentations (anecdotes, observations, stories, analogies, metaphors, quotes, videos, and photos).*

### **Secret #7: Stick to the 18-Minute Rule**

“Eighteen minutes is the ideal length of time for a presentation. If you must create one that's longer, build in soft breaks (stories, videos, demonstrations) every 10 minutes ... Researchers have discovered that cognitive backlog, too much information, prevents successful transmission of ideas.”

“If you're really concentrating, critical listening is a physically exhausting experience. Listening as an audience member is more draining than we give it credit for.”

- ✓ *Break each class into ~20-minute chunks followed by an interactive review.*
- ✓ *The first and last five minutes of class are the most valuable. Use them wisely!*
- ✓ *Apply the rule of three.*

### **Secret #8: Paint a Mental Picture with Multisensory Experiences**

“Deliver presentations with components that touch more than one of the senses: sight, sound, touch, taste, and smell.”

“Remember, the brain does not pay attention to boring things. It's nearly impossible to be bored if you're exposed to mesmerizing images, captivating videos, intriguing props, beautiful words, and more than one voice bringing the story to life ... The brain craves multisensory experiences.”

- ✓ *Incorporate VAK teaching strategies into **every** lesson.*
- ✓ *Help the audience to feel your presentation.*
- ✓ *In your presentation slides, use pictures instead of text whenever possible.*



## **Secret #9: Stay in Your Lane**

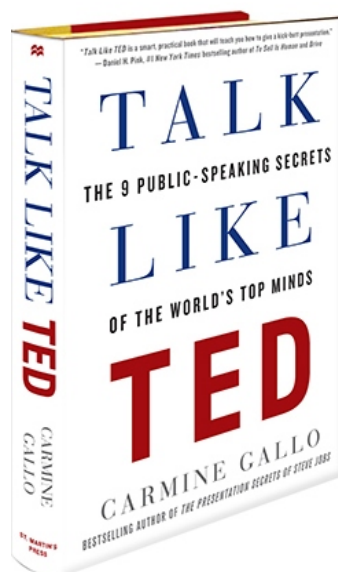
“Be authentic, open, and transparent. Most people can spot a phony ... If you try to be something you're not, you'll fail to gain the trust of your audience.”

“When you deliver a presentation, your goal should not be to ‘deliver’ a presentation. It should be to inspire your audience, to move them, and encourage them to dream bigger.”

“Put in time ... You don't want to be the dancer counting the steps out loud. Repetition frees your mind to tell your ‘story’ in a way that is interesting, dynamic, and more important - authentic.”

- ✓ *Know the content you are teaching like the back of your hand.*
- ✓ *Practice delivering your content – especially the first 15 minutes of class.*
- ✓ *Inspire your students!*

*Now What?*





# Five Precepts of Mindful Teaching

**Everything**

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*Everything from our environment to our body language sends a message.*

**Everything is on**

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*Everything that happens under our orchestration has an intended purpose.*

**Before Label**

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*Learning happens best when we experience the information before acquiring labels for what we've learned.*

**Every Effort**

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*Learning requires work. Acknowledgment for our efforts is essential.*

**If It's Worth It's Worth**

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*Celebration provides feedback regarding progress and increases positive associations with learning.*

**Now What?**

## *Memory Test*

## *Using Technology in the Classroom*



*Now What?*

## *Clicker Systems*

### **Recommended System:**

i-Clicker: <http://www.iclicker.com/>



### **Benefits of Clicker Systems:**

- Actively engages all students
- Improves class attendance
- Encourages peer interactions and bonding
- Allows shy students to participate without fear
- Encourages student reading prior to class
- Provides students with immediate feedback about their and others' understanding
- Provides instructor with immediate feedback of students' understanding
- Provides instructors with opportunities to customize instruction based on student responses
- Provides instructors with opportunities to observe peer discussions during responses
- Increases student morale

### **Best Tips:**

- Check out your proposed location in order to identify any potential technical problems.
- Allow plenty of time to set up and try out the system before the semester begins.
- Provide clear instruction to your students.
- Encourage active discussion by everyone, especially the first couple weeks.
- Keep questions short to optimize legibility.
- Do not make your questions overly complex.
- Have no more than five answers and keep voting straightforward.

## *Clicker Systems*

### **Best Tips (cont.):**

- Do not ask too many questions - use them sparingly to highlight important points.
- Allow time for discussion when designing your presentation.
- Make sure there is a pedagogical reason for asking each question. *What is your objective?*
- Include “I don’t know” as an answer choice to prevent guessing.
- Create wrong answers (distractors) that seem logical and/or plausible.

### **Best Practices:**

- You need to significantly redesign your course to accommodate clickers. You must make adequate time in class for clickers. They cannot be seen as an add-on.
- From the very beginning, explain to your class the pedagogic benefits of class participation (student engagement, collaborative learning, instant feedback, etc.) using clickers.
- Be prepared! Have a back up plan if the hardware and/or software don't work.
- Learn how to perform basic troubleshooting of your students' clickers and the software.
- Make clear to your students how you will handle technical glitches and how they should deal with individual clicker problems. Plan in advance for how to deal with students whose clickers are forgotten, need batteries, or are broken.
- Remember to keep the students perspective in mind (clicker purchase, registration process, clicker programming).
- Be flexible in planning for the semester. You will not be able to cover as much material as you used to.
- Do not use clickers mainly for taking attendance and quizzing.
- Assign course credit for clicker use. I strongly recommend that you give students credit for answering all questions, regardless of whether their answer was correct or not.
- Use clickers for low-stakes assessments only.
- When "too many" students answer a question incorrectly, go over the material again. Have students discuss the question and answers among themselves.

## *Teaching Students How To Succeed*

- ✓ Most students have never really been taught how to learn or how to succeed in school.
- ✓ Your students may not know how to succeed in your classes; it is up to you to teach them.

*What are your top 5 tips for how to succeed in your classes?*

### *10 Rules of Good Studying*

© Barbara Oakley 2014, excerpted from *A Mind for Numbers: How to Excel in Math and Science (Even if You Flunked Algebra)*, Penguin, July, 2014

- 1. Use recall.** After you read a page, look away and recall the main ideas. Highlight very little, and never highlight anything you haven't put in your mind first by recalling. Try recalling main ideas when you are walking to class or in a different room from where you originally learned it. An ability to recall—to generate the ideas from inside yourself—is one of the key indicators of good learning.
- 2. Test yourself.** On everything. All the time. Flash cards are your friend.
- 3. Chunk your problems.** Chunking is understanding and practicing with a problem solution so that it can all come to mind in a flash. After you solve a problem, rehearse it. Make sure you can solve it cold—every step. Pretend it's a song and learn to play it over and over again in your mind, so the information combines into one smooth chunk you can pull up whenever you want.
- 4. Space your repetition.** Spread out your learning in any subject a little every day, just like an athlete. Your brain is like a muscle—it can handle only a limited amount of exercise on one subject at a time.
- 5. Alternate different problem-solving techniques during your practice.** Never practice too long at any one session using only one problem-solving technique—after a while, you are just mimicking what you did on the previous problem. Mix it up and work on different types of problems. This teaches you both *how* and *when* to use a technique. (Books generally are not set up this way, so you'll need to do this on your own.) After every assignment and test, go over your errors, make sure you

understand why you made them, and then rework your solutions. To study most effectively, **handwrite** (don't type) a problem on one side of a flash card and the solution on the other. (Handwriting builds stronger neural structures in memory than typing.) You might also photograph the card if you want to load it into a study app on your smartphone. Quiz yourself randomly on different types of problems. Another way to do this is to randomly flip through your book, pick out a problem, and see whether you can solve it cold.

**6. Take breaks.** It is common to be unable to solve problems or figure out concepts in math or science the first time you encounter them. This is why a little study every day is much better than a lot of studying all at once. When you get frustrated with a math or science problem, take a break so that another part of your mind can take over and work in the background.

**7. Use explanatory questioning and simple analogies.** Whenever you are struggling with a concept, think to yourself, *How can I explain this so that a ten-year-old could understand it?* Using an analogy really helps, like saying that the flow of electricity is like the flow of water. Don't just think your explanation—say it out loud or put it in writing. The additional effort of speaking and writing allows you to more deeply encode (that is, convert into neural memory structures) what you are learning.

**8. Focus.** Turn off all interrupting beeps and alarms on your phone and computer, and then turn on a timer for twenty-five minutes. Focus intently for those twenty-five minutes and try to work as diligently as you can. After the timer goes off, give yourself a small, fun reward. A few of these sessions in a day can really move your studies forward. Try to set up times and places where studying—not glancing at your computer or phone—is just something you naturally do.

**9. Eat your frogs first.** Do the hardest thing earliest in the day, when you are fresh.

**10. Make a mental contrast.** Imagine where you've come from and contrast that with the dream of where your studies will take you. Post a picture or words in your workspace to remind you of your dream. Look at that when you find your motivation lagging. This work will pay off both for you and those you love!

*Now What?*

# *Designing Lessons Using Accelerated Teaching Techniques*

## **1) Prepare the Learner**

Enroll all of your students.

Provide a shared experience to create a common SCHEMA.

## **2) Teach with Purpose**

Everything is on purpose. (*Why am I doing what I'm doing?*)

Incorporate different brain-based teaching techniques into every lesson.

## **3) Cement the Learning**

Provide an opportunity for students to review. (Neurons that fire together, ...)

Celebrate the learning. (emotional cement)

*Now What?*


*Now What?*

## *Excerpts from my Syllabus:*


### **Policy on Cell Phone Usage:**

There is a strict no cell phone policy during lectures and labs. If you chose to violate this policy by using your cell phone to text, check email, and/or surf the web, you will receive a slip of paper similar to the one below. You will then have a choice of either leaving class for the day or losing 20% off of your class participation grade at the end of the semester.

***Violation of Cell Phone Policy***



You are receiving this paper because you have chosen to violate the No Cell Phone Policy by using your cell phone during class or lab.



If you are receiving this during lecture, you have the choice of either leaving class immediately for the day or losing 20% off of your class participation grade at the end of the semester.

If you are receiving this during lab, you will lose 20% off of your grade for this lab.

### **Policy on Late Assignments:**

Assignments (HW, lab reports, ...) must be turned in by the beginning of class on the day they are due. Any assignment turned in after that time is considered late and will be marked down 50%. Late assignments must be turned in by the next class meeting. After that, no late assignments will be accepted.

You will get two NQA (No Questions Asked) coupons similar to the one below that you may use at any time during the semester. These coupons will allow you to turn in a HW assignment or lab report up to one day late without penalty.


**NQA Coupon 1**  
**No Questions Asked**

This coupon entitles you to turn in one assignment up to one meeting day late without penalties. May be used for homework or lab reports.

Print name \_\_\_\_\_

Assignment \_\_\_\_\_

Sign here \_\_\_\_\_





## *Additional Resources*

### ***Recommended Books:***

Ambrose, Susan et al. *How Learning Works: 7 Research-Based Principles for Smart Teaching*. San Francisco: Wiley and Sons, 2010

Churches, Richard and Terry, Roger. *NLP for Teachers: How to be a Highly Effective Teacher*. Bethel, CT: Crown House Publishing, 2007

DePorter, Bobbi, Reardon, Mark and Singer-Nourie, Sara. *Quantum Teaching: Orchestrating Student Success*. Boston: Allyn & Bacon, 1999

Doidge, Norman. *The Brain that Changes Itself*. London: Penguin Books, 2007

Dweck, Carol. *Mindset: The New Psychology of Success*. New York: Ballantine Books, 2006.

Medina, John. *Brain Rules*. Seattle: Pear Press, 2009

Meier, Dave. *The Accelerated Learning Handbook*. New York: McGraw-Hill, 2000

Rose, Colin and Nichol, Malcolm. *Accelerated Learning for the 21st Century*. New York: Dell Publishing, 1997.

Sousa, David. *How the Brain Learns*. Thousand Oaks, CA: Corwin Press, 2001

Willis, Judy. *Research-Based Strategies to Ignite Student Learning*. Alexandria: ASCD, 2006

### ***Recommended Websites:***

[www.acceleratedlearning.com](http://www.acceleratedlearning.com) (for information on accelerated learning)

[www.wholebrainteaching.com](http://www.wholebrainteaching.com) (for information about whole-brain teaching)

[www.aan.com](http://www.aan.com) (American Academy of Neurology, very technical)

[www.dana.org](http://www.dana.org) (Dana Alliance for Brain Initiatives, very technical)

[www.sfn.org](http://www.sfn.org) (Society for Neuroscience)

[www.brainconnection.com](http://www.brainconnection.com) (for articles)

[www.brainplace.com](http://www.brainplace.com) (for cool images of the brain)

[www.brainresearch.com](http://www.brainresearch.com) (for research)

[www.neurosci.nature.com](http://www.neurosci.nature.com) (for technical articles)

[www.mindtools.com](http://www.mindtools.com) (for articles)

[www.joe-mccullough.com](http://www.joe-mccullough.com) (accelerated learning and life skills)

