

Designing Courses that are Compatible with Current Brain Research

What Students Can Do To Help Themselves

- Get 7-8 hours of sleep each night
- Going to sleep right after a session can improve learning
- Get 40-60 minutes of strenuous aerobic exercise at least 3-4 days/week
- Do 30 minutes of aerobic exercise before school that elevates the heart rate to your target rate; see Ratey's research at Naperville, IL <http://www.learningreadinesspe.com/>. Use a doctor or certified trainer to help you set your target heart rate.
- Take a 25-minute nap in between study sessions if you feel fatigued or stressed (Dement, 2009)
- Take a 30-minute break and do yoga, meditate, dance, jump rope, take a walk, use an elliptical machine
- Stay focused on one task:
 - Multitasking Slows Learning
 - It is **not possible** to multitask when it comes to activities that require the brain's attention (Foerde Knowlton Poldrack, 2006)
 - When trying to do two things at once, the brain temporarily shuts down one task while trying to do the other (3 Dux, P. E., Ivanoff, J., Asplund, C. LO., and Marois, R. 2007)
- Keep a water bottle handy and hydrate often
- Drink moderate amounts of coffee
- Eat snacks such as: Avocados, Dark Chocolate, Nuts and seeds, Beans

Source for these suggestions: *The New Science of Learning: How Brain Research is Revolutionizing the Way We Learn* by Terry Doyle and Todd Zakrajsek.

<http://learnercenteredteaching.wordpress.com/>

What Teachers Can Do to Prepare the Brain for Learning. Designing a Brain Compatible Course

- During long classes of 2 or more hours, take a 10-minute break during class and turn on a Brain Gym Activity (<https://www.youtube.com/watch?v=O5ChXC-rHLE>) or play the SPARK Rap Video at <http://www.johnratey.com/>
- See John Ratey's video, " Exercise and Learning" <http://www.johnratey.com/videos.php>
- See John Ratey's video titled "Exercise and the Brain," "Spark Lecture"

- [See the sample lesson](#) using movement
- More lessons on using movement, see <https://www.teachingchannel.org/videos/dramatic-interpretations-of-poetry>
- Scaffolding Instruction

Robert Bjork (1994) defines learning as "the ability to use information after significant periods of disuse; in addition it is the ability to use the information to solve problems that arise in a context different (if only slightly) from the context in which the information was originally taught." Given this definition we should build courses, which help our students move along this continuum of teacher control to student control.

Teacher Control _____ Student Control

(e.g. Modeling of Skills and Thinking)

(Problem Solving in New Context)

Teachers need to scaffold instruction into course and key course projects so that students learn how to learn in each of our disciplines. All teachers intuitively break down projects and courses into key components and provide appropriate coaching along the way. But sometimes we need reminders and good examples to enrich our good work. This is especially important in conducting research and writing about research in our disciplines. Students who are adept at conducting research in one discipline may not be able to apply those skills to a new discipline.

Teachers enter Dr. Rochio's Action Research For Teachers course with some anxiety when they find out that the end product is a research proposal. This is not the type of writing teachers do on a daily basis as they face 22 first graders eager to learn how to read. Dan begins the course by sharing sample action research proposals along with the opportunity to ask clarifying questions. Dan also explains that the final draft of the proposal due at the end of the course will not be given a grade until a final submission. During each week of the course, each part of the proposal is written and each part receives instructor and peer feedback. The process looks like this:

- Several model proposals presented with appropriate scoring guides and time for questions
- Instructor talks through a model of one section of the proposal
- Instructor teaches a mini-lesson modeling how to write the typically problematic parts of the section
- Students read research related to their topics, talk to peers about their topics of interest and then write a first draft of section one
- Feedback is provided by peers and instructor using scoring guide but no grades are assigned
- Next section is presented in the same fashion
- During 6-7 sessions during the course the instructor has a short 5-15 minute conference with each student about their work: this could be an in-class session, Facetime conference, phone conference, or LMS conference.
- In addition, each teacher seeks the advice of 2-3 critical friends in the teaching community who have a different perspective and more expertise in her area of interest

Of course the key to scaffolding the writing or reading process in any course is knowledge of the students' interests, level of ability, and temperament. We need to first gain the trust of our students. (see the section on [Creating Engaging and Inclusive Classrooms](#) for resources and see the .pdf from Northern Illinois University: [Instructional Scaffolding to Improve Learning](#))

References

Bjork, R.A. (1994). *Memory and metamemory considerations in the training of human beings*. In J. Metcalfe and A. Shimamura (Eds.), *Metacognition: Knowing about knowing* (pp. 185-205). Cambridge, MA: MIT Press.

Dement, W. C. (2000). *The promise of sleep*. Random House.

Dux, P. E., Ivanoff, J., Asplund, C. L. O., & Marois, R. (2006). *Isolation of a central bottleneck of information processing with time-resolved fMRI*. *Neuron*, 52(6), 1109-1120.

Foerde, K., Knowlton, B. J., & Poldrack, R.A. (2006). *Modulation of competing memory systems by distraction*. *PNAS*, 103(31), 11778–11783.

Lipscomb, L., Swanson, J., West, A. (2004). Scaffolding. In M. Orey (Ed.), *Emerging perspectives on learning, teaching, and technology*. Retrieved Dec. 3, 2014, from <http://epltt.coe.uga.edu/>