Beliefs about Learning that Make You Stupid

• Learning is fast
  – For example, “One good reading is enough”
  – You learn more during review than you do at initial reading
  – Students, especially weak students, grossly underestimate the time required to complete assignments

• Being good at a subject is a matter of inborn talent rather than hard work,
  – “I’m bad at math.” vs. “I have to work especially hard at math.”

• Knowledge is composed of isolated facts
  – Study by memorizing facts in isolation of each other

• I’m really good at multi-tasking, especially during class or studying

Metacognition

• A student’s awareness of their level of understanding of a topic
• Metacognition distinguishes between stronger and weaker students
• One of the major tasks for a freshman is developing good metacognition
  – In high school, they spent years developing a metacognitive sense that is likely inadequate or even counterproductive for college.

Which of the following is the MOST important ingredient for successful learning?
1. The intention and desire to learn
2. Paying close attention to the material as you study
3. Learning in a way that matches your personal Learning Style?
4. The time you spend studying
5. What you think about while studying
Achieving Deeper Processing

As you study, follow these principles:
- **Elaboration**: How does this concept relate to other concepts? Is it a story?
- **Distinctiveness**: How is this concept different from other concepts?
- **Personal**: How can I relate this to my own personal experience?
- **Appropriate to Retrieval and Application**: How am I expected to use or apply this?

Things That Do and Do Not Help Learning

**What Doesn’t Help**
- Motivation to learn (necessary, but not sufficient)
- Amount of time studied (necessary, but not sufficient)
- Memorization of isolated facts (usually counterproductive)
- Learning styles (completely irrelevant)
- Multi-tasking (always counterproductive)
- Pseudo-study or shallow study (waste of valuable time)

**What Does Help**
- Developing metacognition
- Deep, appropriate processing of critical concepts
- Connected understanding
- Minimize distractions; Maximize focus
- Practicing retrieval and application

Cognitive Load Theory (e.g. van Merrienboer & Sweller, 2005)

- Mental effort is the amount of concentration that a person has available to devote to tasks
- Mental effort is always a limited resource
- Cognitive Load is the total amount of mental effort a task requires to complete it
  - A person can do multiple tasks at once as long as the total cognitive load does not exceed available mental effort
- If cognitive load exceeds available mental effort, then performance suffers

Implications of Cognitive Load Theory

- If the cognitive load demanded of students exceeds their available mental effort, then learning will not occur
- If the cognitive load demanded of students takes up most or all of available cognitive effort, then there will not be enough mental effort available for learning or schema formation
- Teachers must monitor, manage and minimize cognitive load to allow schema development as well as design activities to promote schema development
How to Get the Most Out of Studying: A Video Series

I’ve created a unique series of videos to help students make the transition to college level studying. They are based on cognitive research on how people learn. The webpage for the videos is http://www.samford.edu/how-to-study/. The overall theme of the videos is that if students use ineffective or inefficient ways of studying, they can study long and hard and still fail; but if they use effective strategies, they will get the most learning out of their study time and be more likely to succeed. Each video lasts 7-8 minutes.

**Video 1: Beliefs That Make You Fail…Or Succeed**
This video identifies and corrects common mistaken beliefs students often possess that undermine their learning.

**Video 2: What Students Should Understand About How People Learn**
The second video introduces a simple but powerful theory of memory, Levels of Processing, which can help students improve their study.

**Video 3: Cognitive Principles for Optimizing Learning**
The third video operationalizes the concept of level of processing into four principles that students can use to develop effective study strategies.

**Video 4: Putting the Principles for Optimizing Learning into Practice**
The fourth video applies the principles of deep processing to common study situations, including note taking and highlighting while reading.

**Video 5: I Blew the Exam, Now What?**
This video addresses what students should and should not do when they earn a bad grade on an exam.
1) Videos on How to Get the Most out of Studying: [www.samford.edu/how-to-study](http://www.samford.edu/how-to-study)

2) APS Observer article on my presentation to freshmen on how to study effectively: [https://dl.dropboxusercontent.com/u/22761776/Chew%20APS%20Observer%202010.pdf](https://dl.dropboxusercontent.com/u/22761776/Chew%20APS%20Observer%202010.pdf) or [http://bit.ly/1o73gFU](http://bit.ly/1o73gFU)


11) A video of a presentation I gave the New American Colleges and Universities (NAC&U) on improving student learning correcting student and teacher misconceptions can be found at: [http://goo.gl/4GptWz](http://goo.gl/4GptWz)
For Further Reading

Blogs on Teaching and Learning:

Daniel Willingham Science and Education Resources and Blog: Daniel Willingham is a cognitive neuroscientist who maintains a website on current research applied to education. While the focus is on K-12, there is much that applies to higher education as well. He has two books out, but you can learn a lot just by reading the resources here, especially his blog. http://www.danielwillingham.com/index.html

Annie Murphy Paul writes the Brilliant Blog on student learning. A terrific blog that follows the latest in research that is relevant to teachers. www.anniemurphypaul.com

The Teaching Professor Blog is written by Maryellen Weimer, a pioneer in pedagogical research. She is able to bring together pedagogical research from across many fields. http://www.facultyfocus.com/topic/articles/teaching-professor-blog/

Books on cognitive research applied to teaching:


Mental Mindset and Education:

Carol Dweck conducted the groundbreaking work on mental mindset, such as beliefs about fixed versus fluid intelligence, affects academic success. There is plenty about her work on the Internet, but the best way to find out more about applying her work to teaching is to look at the PERTS website.

“ERTS is an applied research center at Stanford University. We work with leading experts on academic motivation to raise student achievement on a large scale. In the process, we conduct research that enables us to improve our programs and to expand what is known about academic motivation.” http://www.perts.net/home/PERTS.php

Miscommunication and conflicting expectations between teacher and student can undermine instruction even when both the student and teacher are motivated to succeed. Cox makes this point in her book:


The Carnegie Foundation for the Advancement of Teaching has an excellent summary of mental mindset as it applies to productive persistence, especially as it relates to developmental math. Although focused on math, the general principles discussed apply to all areas.


**Formative Assessment**


There are many good resources on formative assessment both online and in published books. Here is one book I have seen that is geared to K-12 but is also applicable to college level teaching.