Leveraging Psychology to Create Compelling Learning Experiences
Part 1: Attention and Memory
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Resources for our workshops are available online:

https://sites.google.com/site/focusremember/
Attention and memory are highly intertwined. Teaching memorably means capturing students’ focus first.

Content knowledge and higher thinking aren’t mutually exclusive. We know a lot about how to build better recall in less study time.

Thinking skills don’t fall out of content knowledge, but sometimes we teach as though they do. The right kind of practice is crucial.
Overview of the principles in action

Demonstration, illustration and examples

Application Work

Share Out and Wrap Up
Attention and Memory

OVERVIEW
Attention

How do we capture student focus and use it as effectively as possible?

Principles to remember:
Attention

How do we capture student focus and use it as effectively as possible?

Principles to remember:
Attention involves the brain’s mechanisms for prioritizing and allocating resources
Attention

How do we capture student focus and use it as effectively as possible?

Principles to remember:
Attention drives memory
Attention

How do we capture student focus and use it as effectively as possible?

What gets in the way:

• Excessive cognitive load

• Poor mastery ("automaticity") of lower-level processes

• Dysfunctional multitasking, mistaken beliefs about attention
Applying the Principles

**Ask Students to Respond**

Nothing focuses us on the task at hand like having to respond. SRS (clicker) systems and phone polls are options for F2F classes; online, alternating text with questions can keep students involved.

**Automate Lower Level Processes**

Ask yourself: What can be mastered to the point of needing less attention? Create assignments that require and reward practice; consider incentivizing speed.

**Address Myths**

Some have been told that they are part of a “digital native” generation with special abilities. Help them question this idea.
Memory

How do we make our material memorable – in less study time?

Principles to remember:
Memory

How do we make our material memorable – in less study time?

Principles to remember:

Goal relevance

• What is memory for?
• Context
• Depth of processing
Memory

How do we make our material memorable – in less study time?

Principles to remember:

Visual superiority (usually)

• But: Don’t worry about “learning styles”
Memory

How do we make our material memorable – in less study time?

Principles to remember:

“Big Three” applied memory findings:

• Testing effect
• Spacing effect
• Interleaving
Would you sequence studying like this:
Or like this:
Applying the Principles

Harness the Testing Effect

Pre-class reading quizzes, repeatable quizzes and self-quizzing tools help build memory faster. Consider spot grading for open-ended questions. Choose tools & resources that feature quizzing; expect to reorient student approaches to this kind of testing.

Space It Out

Use technology to stagger deadlines and encourage shorter, more frequent sessions. Especially if material involves categories or problem types, try interleaving.

Push Powerful Processing

Assign students to synthesize information in discussions; ask students to relate material to themselves. Provide visuals – especially materials such as interactive diagrams or illustrations coupled with audio narration.
Attention and Memory

DEMONSTRATION, ILLUSTRATION, EXAMPLES
Attention Matters!™ is a freestanding module that takes about 1-2 hours for students to complete. It uses interactive activities and video demonstrations to show students the limitations of attention and address common misconceptions about how attention and memory work.

The project is also described in detail in chapter 24 of this free E-book: http://teachpsych.org/ebooks/useoftech

GO TO: Unit One, What do you know about attention?

**Introduction**

We all know what it feels like to paying attention: you’re focused, engaged, and aware, filtering out background stuff and letting through the information you need. Psychologists and brain researchers think about attention in much the same way. It’s what our brain does to prioritize at any given moment what should get through and where to direct your mental resources.

Please note: you will need to click the Mark Reviewed box to see the next item on this page. You should do this until you reach the Quiz.

**Colour Changing Card Trick**

Test your powers of concentration by watching the following video. When you have completed this click on the Mark Reviewed box and go to the next video.

**Sports Focus Test**

Follow the directions in this YouTube video to test your ability to correctly count the number of passes made only by the players in white. When you have completed this click on the Mark Reviewed box and go to the next video.

(If you’ve done this exact test before, skip it by clicking on Mark Reviewed and going directly to What Was That About? link below.)
Overview of the sequence of content and activities within the *Attention Matters!* module, broken down into the three different units. Icons represent different kinds of media and learning activities. Participants completed each one in order before proceeding to the next.

All icons are Creative Commons from The Noun Project, as follows:
- Web Page by Kokota; Video by Xinh Studio; PDF by Alf; Survey by Gregor Cresnar; Document by Bintang Anandhiya; Discussion by BomSymbols; Document Check list by alvianwijaya; Activity by Gregor Cresnar; Web Link by Dinosoft Labs; Certificate by Ralf Schmitzer; Self Reflection by Aenne Brielmann.
Counterproductive Beliefs Survey

We created this 20-question survey based on illusions discussed in Chabris and Simons’ 2010 book *The Invisible Gorilla: And Other Ways Our Intuitions Deceive Us*. These common misconceptions include the *illusion of attention* and the *illusion of memory*. We added another sub-group of items for we termed the *illusion of exceptionalism*. For the illusion of memory, we focused several items specifically on learning, such as the effectiveness of quizzing versus rereading.

All were Likert-style, five-point response scale questions.

Examples include:

1. If something is important, I’ll notice it regardless of what I’m doing or what else is going on around me.
2. I can effectively pay attention to several things at once.
3. I can get what I need out of a class or meeting while doing other things at the same time.
4. Memory works by “recording” information and playing it back later.
5. The best way to get class material to stick in memory is by re-reading it.
6. It’s possible to learn “by osmosis,” in other words, picking up information in the background while you do something else.
7. Some people are naturally able to multitask without any loss to performance.
Findings so far...

• The illusions of attention subscale predicts self-reported multitasking behaviors, in a worldwide community sample of adults recruited via Amazon’s Mechanical Turk (N = 121)
• Counterproductive beliefs were higher in the worldwide community sample versus NAU students
• Among NAU students, counterproductive beliefs scores significantly improve after completing the module
Scores were significantly lower for participants who completed the survey after completing the module, $F$ (1, 270 = 62.99, $p < .001$, $\eta^2 = .189$). The interaction with sub-scale was not significant, $p = .751$. Error bars in the graph represent confidence intervals.
Is student distraction an important issue?

What do you think of this kind of approach for addressing it?
Try this memory exercise...

HOW TO REMEMBER (ALMOST) ANYTHING

1. Quiz, don't reread.
   - Recalling information builds pathways that strengthen recall in the future. Passive exposure rarely makes things stick.

2. Visualize it.
   - Associating information to sensations is memorable, and vision is the strongest sensory cue for most people.

3. Structure it.
   - Break up the information into parts or sub-parts. Put related things together in a meaningful order.

4. Give it meaning.
   - Your brain is set up to capture information that means something to you. Before you try to remember something, be sure you understand it.

5. Relate it to yourself.
   - Personal relevance makes things stick and takes advantage of what you already know.

6. Create a cue.
   - Figure out what is most forgettable about the information and link that to something that's more vivid or easier to recall.

Infographic by Michelle D. Miller, Ph.D., NAU University College
Module 1 - Week 1

Learning Objectives for Module 1
At the end of this module, you will be able to:

- Explain and identify real-life examples of these forms of memory: episodic, semantic, procedural, prospective
- Explain and identify real-life examples of encoding and retrieval
- Explain why cues are important for retrieving information from long-term memory
- Explain what memory scientists mean by sensory memory, short-term memory, working memory, and long-term memory
- Explain how imagery relates to memory, including the memory techniques described in chapters 1-2 of Moonwalking with Einstein
- Explain what the method of loci is and why it works so well
- Use imagery to remember word pairs
- Use the peg word mnemonic to remember a short list of words
- Describe your personal memory challenges and goals for improving your memory
- Summarize why the author of Moonwalking with Einstein became interested in memory championships
- Describe the baker/baker paradox and explain what it tells us about memory

Memory (Encoding, Storage, and Retrieval)
This is an online module from the NOBA Project, a free psychology resource. Read it through at your own pace, paying special attention to points that are in the learning objectives for this module. Then, you can take the self-quiz at the end (optional but strongly recommended).

Assigned Reading
Please read Chapters 1-2 of the Moonwalking with Einstein book. I've posted a PDF of these two chapters to tide you over if you don't have a copy yet - but please note that because of copyright restrictions, no further chapters will be posted here.

Animation: Divisions of Memory
This is a video animation that illustrates concepts we will use throughout the course. Please view it and let me know if you have any questions or comments.

Weekly Walkthrough Module 1 Segment 1
This video introduces you to what we'll learn in the course, and to what concepts are important to helping us learn to improve memory.

Demonstration: Visualize It!
Putting retrieval practice to work

• How are assessments framed within the course?

• Tools and techniques:
  – Repeatable quizzes
  – Personalized quizzes
  – Quizzing apps, e.g. Quizlet
  – Gamifying quizzes
  – See also: retrievalpractice.org
Attention and Memory

APPLICATION
Application

First:
• Review the resource grid sheet.
  – Alternatively, https://sites.google.com/site/focusremember/
  – Is there at least one you would consider using?

Then:
• Review the worksheet titled Applying It, Part 1
• Define a teaching challenge.
• Using concepts from today, articulate a strategy for addressing the challenge.
Thank You – and see you tomorrow!

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