

## Knowledge Base Document: Debunking Common Study and Productivity Myths

This document synthesizes research-backed evidence to debunk widely accepted, yet ineffective, study and productivity practices.

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### Core Myth 1: The Myth of Learning Styles

**Claim:** Students learn best when instruction is tailored to their specific "learning style" (e.g., visual, auditory, or kinesthetic learners).

**Debunking Evidence:**

- The belief that individuals have specific learning styles, such as auditory or kinesthetic, is characterized as a "pernicious myth" and a concept that, while intuitive, is fundamentally incorrect.
- Research indicates that the concept of learning styles is deeply flawed and has little empirical support.
- A major review of research on this topic found "virtually no evidence" for the idea that matching instructional modality to a student's self-identified style is critical to success.
- No study has shown that teaching to an identified learning style results in improved student success, retention, or learning outcomes. In fact, some research suggests that students performed better when taught using a different modality than their self-identified style.
- Learning styles are often unstable, relying on self-reports which measure "learner preference" rather than objective style, as humans are generally poor judges of their own learning.
- The human brain is designed to synthesize data *from lots of sources*, not specialize in just one. Teaching in multiple methods (multi-modal learning) enhances achievement because it maintains sustained attention, requires learners to integrate knowledge in new ways, and makes the content more interesting.

**Critical Citation:**

- **Roundup on Research: The Myth of 'Learning Styles' | Online Teaching**
  - **Learning Myths And Realities From Brain Science : NPR Ed : NPR**
  - **Visual, Auditory, And Kinesthetic Learning Is a Lie — Learn to Scale**
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### Core Myth 2: Passive Review Strategies (Rereading and Highlighting) are Effective

**Claim A: Rereading texts and notes is a highly effective way to learn material.**

**Debunking Evidence (Rereading):**

- Although rereading is one of the most common study strategies, it has been assigned a rating of **low utility** in cognitive and educational psychology reviews.
- Simply rereading texts or notes is not considered actively engaging with the material, and it tends to lead to quick forgetting.
- The small gains in retention resulting from rereading make it "much less effective" than other techniques.
- The primary danger of rereading is that it leads to the "**illusion of mastery**" or "illusion of competence". As students review the text multiple times, the material becomes familiar, prompting them to falsely believe they have achieved a deeper understanding when they have not. Effective learning requires students to "get into" the reading or notes rather than simply "going over" them.

**Claim B: Highlighting or underlining material helps students retain information.**

### **Debunking Evidence (Highlighting):**

- Highlighting and underlining are not considered active studying techniques.
- Most studies have shown **no benefit of highlighting** (as typically used by students) over and above the benefit achieved from simply reading the text.
- The belief that highlighting helps retention is based on the rationale that decision-making improves memory; however, this effect is negated because students are often unable to correctly identify the most important parts of the text to highlight.
- Students often highlight so much material that the highlighting fails to prioritize content or establish relationships between pieces of information.

### **Critical Citations:**

- **I've Been Studying All Wrong: Highlighting and Rereading – Teaching Among Trees**
  - **Rethinking Rereading | Faculty Focus**
  - **Studying 101: Study Smarter Not Harder – Learning Center**
  - **Learning Myths And Realities From Brain Science : NPR Ed : NPR**
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Core Myth 3: Cramming is the Best Way to Prepare for an Exam

**Claim A: Cramming (massed practice) maximizes study benefits, especially right before a test.**

### **Debunking Evidence (Retention):**

- Cramming may appear to "work" because it allows a student to perform adequately on a test in the immediate present, achieving similar scores to distributed practice in the short term (e.g., scoring about 70% one week later in a math study).
- However, if learning is defined as achieving **long-term retention**, cramming is ineffective. In one study, students who crammed scored only **~32%** when re-tested three weeks later, whereas those who spaced out their practice (distributed practice) scored **~64%**, having retained approximately 67% more information despite spending the exact same total amount of time studying.
- Cramming involves massed practice, where the neurological changes needed for learning occur **much more slowly** (over about five days), resulting in weaker, less stable long-term memories vulnerable to decay. Distributed practice, conversely, produces observable structural changes in the brain rapidly (within four hours), leading to more efficient memory consolidation and more durable memories.

**Claim B: Sacrificing sleep to cram is beneficial for grades.**

### **Debunking Evidence (Sleep):**

- Sacrificing sleep for extra study time is **counterproductive** and increases academic problems the following day. Adequate sleep is considered critical for academic success, as sleep deprivation impedes learning.
- The majority of college students delay their bedtime and reduce their sleep duration the night before a test, with more than 10% of students reporting no sleep at all (all-nighters).
- Research confirmed that **sleep duration was positively correlated with test performance** in two separate student samples. An increase of one hour of sleep duration the night before a test was associated with a 15.0% increase in the odds ratio of correct answers in one sample and a 3.8% increase in another.

### **Critical Citations:**

- **The Truth About Cramming: Why Your Brain Needs Breaks | Bulletproof Musician**

- Cramming for a test? Don't do it, say UCLA researchers | UCLA Health
  - Should I study or should I go (to sleep)? The influence of test schedule on the sleep behavior of undergraduates and its association with performance - PMC
  - Studying 101: Study Smarter Not Harder – Learning Center
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#### Core Myth 4: Multitasking Increases Productivity and Efficiency

**Claim: Multitasking allows individuals to handle multiple complex tasks simultaneously, improving efficiency.**

**Debunking Evidence:**

- Neuroscience research largely suggests that multitasking is a myth. When attempting to multitask on complex tasks, the brain engages in rapid **"task switching"** (or serial tasking) rather than simultaneous processing.
- This switching creates a **"switching cost"**—cognitive effort used to rapidly shift attention—which leads to decreased accuracy, slower reaction times, and increased mental fatigue.
- A significant amount of research confirms that multitasking does not improve efficiency and negatively affects results.
- Divided attention interferes with the encoding process, disrupting memory formation and leading to weaker retention and recall of new information.
- Studies show that getting sidetracked by other tasks costs, on average, **25 minutes** before a person returns to the original task, and they often switch to an average of 2.3 other tasks before getting back to the first one.
- Frequent multitaskers are actually worse at key cognitive functions, including filtering out distractions and switching tasks efficiently, suggesting that multitasking trains the brain to be more distractible, not more efficient.

**Critical Citations:**

- **The Myth of Multitasking: How the Brain Handles Focus and Attention — Dendrite Learning**
  - **How Much Time Do We Lose Task-Switching? – PRODUCTIVITY REPORT**
  - **Studying 101: Study Smarter Not Harder – Learning Center** (Multiple instances:)
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#### Core Myth 5: Praising Innate Intelligence (Fixed Mindset) Motivates Achievement

**Claim: Telling students they are "smart" is the best way to motivate them to succeed.**

**Debunking Evidence:**

- Praising intelligence (known as "intelligence praise") is countereffective. Studies indicate that children who receive copious praise for their intelligence are **more likely to adopt a fixed-mindset orientation** later in life.
- A **fixed mindset** is the implicit belief that intelligence and abilities are largely fixed and unchangeable. Individuals with this mindset tend to see effort as a sign of weakness and failure as an inherent inability to improve. They respond to academic challenges by withdrawing, disengaging, or repeating ineffective strategies.
- The research suggests that teachers should motivate students by praising their effort and strategy use ("process praise") instead of praising their ability.

- The alternative, a **growth mindset**, is the belief that intellectual ability can be substantially increased through experience and effort. Students with a growth mindset view effort as an integral component of learning and respond to setbacks by allocating more effort, seeking feedback, and experimenting with new approaches.

#### **Critical Citations:**

- **Growth Mindset | Teaching + Learning Lab**
- **Learning Myths And Realities From Brain Science : NPR Ed : NPR**
- **What Can Be Learned from Growth Mindset Controversies? - PMC**

#### **APA Citations:**

1. **"Cramming for a test? Don't do it, say UCLA researchers | UCLA Health"**
  - UCLA Health. (2012, August 22). *Cramming for a test? Don't do it, say UCLA researchers*. [Source 1–13]
2. **"Education Vs Talent: Which is More Important for a Better Career - K12 Digest"**
  - Husain, S. (2021, December 14). *Education Vs Talent: Which is More Important for a Better Career*. K12 Digest. [Source 14–29]
3. **"Growth Mindset | Teaching + Learning Lab"**
  - Teaching + Learning Lab. (n.d.). *Growth Mindset*. Massachusetts Institute of Technology. [Source 30–62]
4. **"How Much Time Do We Lose Task-Switching? – PRODUCTIVITY REPORT"**
  - Duffy, J. (2022, February 2). *How Much Time Do We Lose Task-Switching?*. PRODUCTIVITY REPORT. [Source 63–80]
5. **"How to Study – Learning Strategies Center"**
  - Learning Strategies Center. (n.d.). *How to Study*. Cornell University. [Source 81–85]
6. **"I've Been Studying All Wrong: Highlighting and Rereading – Teaching Among Trees"**
  - Teaching Among Trees. (n.d.). *I've Been Studying All Wrong: Highlighting and Rereading*. [Source 86–93]
7. **"Learning Myths And Realities From Brain Science : NPR Ed : NPR"**
  - Kamenetz, A. (2017, March 22). *Learning Myths And Realities From Brain Science: NPR Ed*. NPR. [Source 94–101]
8. **"Rethinking Rereading | Faculty Focus"**
  - Weimer, M. (2018, May 23). *Rethinking Rereading*. Faculty Focus. [Source 103–109]
9. **"Roundup on Research: The Myth of 'Learning Styles' | Online Teaching"**
  - Straub, E. O. (2024, January 10). *Roundup on Research: The Myth of 'Learning Styles'*. Online Teaching. [Source 110–126]
10. **"Should I study or should I go (to sleep)? The influence of test schedule on the sleep behavior of undergraduates and its association with performance - PMC"**
  - Estevan, I., Sardi, R., Tejera, A. C., Silva, A., & Tassinio, B. (2021, March 10). *Should I study or should I go (to sleep)? The influence of test schedule on the sleep behavior of undergraduates and its association with performance*. *PLoS One*, 16(3), e0247104. [Source 127–194, 171–193]
11. **"Studying 101: Study Smarter Not Harder – Learning Center"**
  - Learning Center. (n.d.). *Studying 101: Study Smarter Not Harder*. University of North Carolina at Chapel Hill. [Source 195–217, 218–240, 241–263]
  - (Note: These three sources appear to be excerpts from the same handout, thus they are grouped under one title, but cover ranges,, and.)

**12. "The Myth of Multitasking: How the Brain Handles Focus and Attention — Dendrite Learning"**

◦ Smart, D. (2025, March 12). *The Myth of Multitasking: How the Brain Handles Focus and Attention*. Dendrite Learning. [Source 264–276]

**13. "The Truth About Cramming: Why Your Brain Needs Breaks | Bulletproof Musician"**

◦ Kageyama, N. (2016, January 10). *The Truth About Cramming: Why Your Brain Needs Breaks*. Bulletproof Musician. [Source 277–305]

**14. "Visual, Auditory, And Kinesthetic Learning Is a Lie — Learn to Scale"**

◦ Newman, D. (2026, April 26). *Visual, Auditory, And Kinesthetic Learning Is a Lie — Learn to Scale*. Learn to Scale. [Source 306–317]

**15. "What Can Be Learned from Growth Mindset Controversies? - PMC"**

◦ Yeager, D. S., & Dweck, C. S. (2020, December). *What Can Be Learned from Growth Mindset Controversies?*. *American Psychologist*, 75(9), 1269–1284. [Source 318–391]