

What Educational Psychology Tells Us About Student Success

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A few (perhaps) mind-blowing ideas...

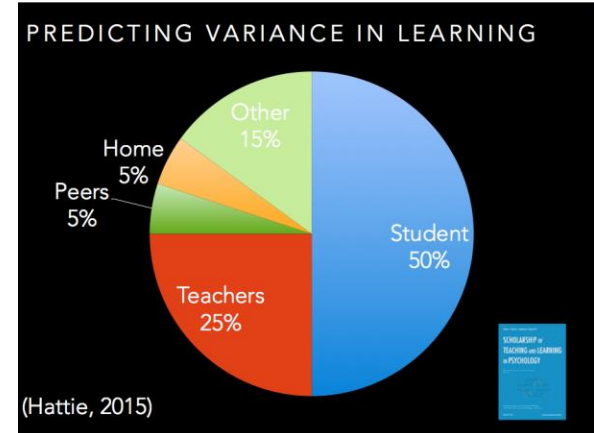


Image from regangurung.com

Three Recommendations from Educational Psychology For Student Success:



BE STRATEGIC TO
AMPLIFY **MEMORY**



BE REFLECTIVE AND
GOAL-DIRECTED ABOUT
LEARNING
(**METACOGNITION**)



BE MINDFUL OF
MOTIVATION

How can we help students to
be strategic to amplify
memory?



What strategies *do* our students use to learn, and do they work?

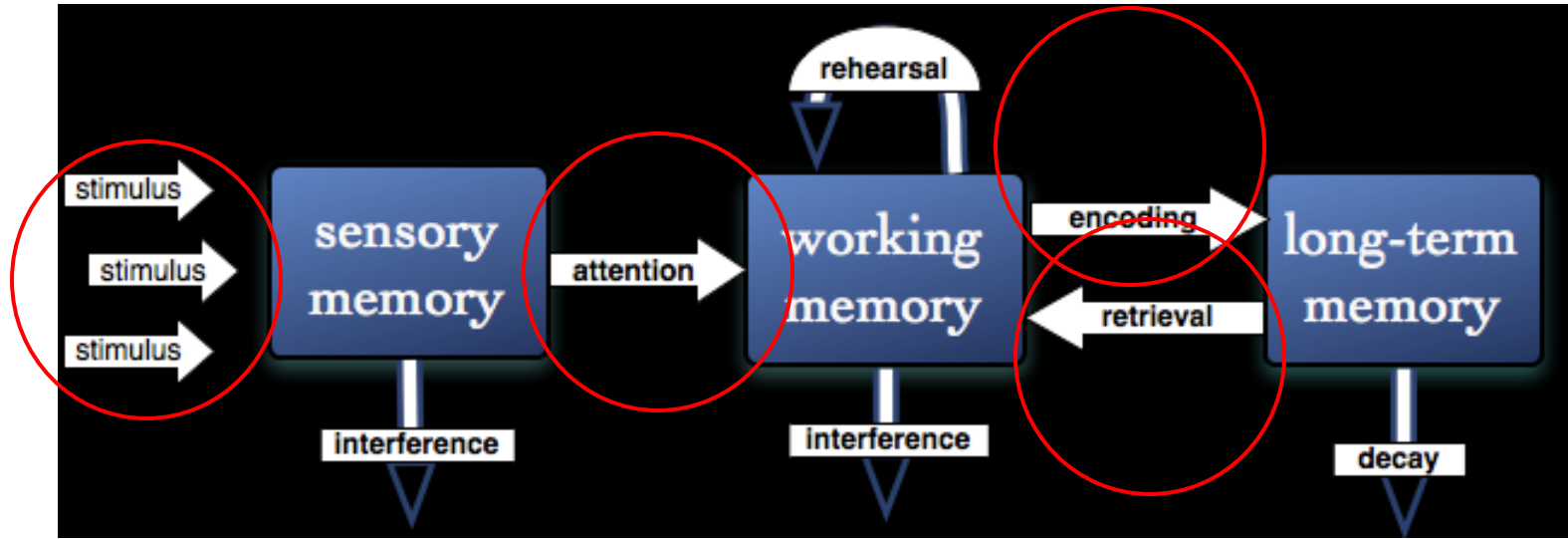
Technique	Utility
Elaborative interrogation	Moderate
Self-explanation	Moderate
Summarization	Low
Highlighting	Low
The keyword mnemonic	Low
Imagery use for text learning	Low
Rereading	Low
Practice testing (retrieval practice)	High
Distributed practice (spaced practice)	High
Interleaved practice	Moderate

Dunlosky, et al. (2013)

“Although individual differences occur in effective strategy use, with some students using effective strategies that contribute to their achievement, **many students not only use relatively ineffective strategies (e.g., rereading), but believe that they are relatively effective.**” (Bjork, Dunlosky, & Kornell, 2013, p. 423)

This hasn't changed in recent years (Rinella & Putnam, 2022).

Help students understand (and overcome) the **choke points** of the memory system (Chew, 2021).



Good learning happens when we
practice retrieving information from long-term memory (Karpicke, 2012)

A few ways to encourage this:

- Low-stakes quizzes (Atabek Yigit, Balkan Kiyici, & Çetinkaya, 2014)
- Student-generated test questions (Doyle, Buckley, & McCarthy, 2020)
- Online lecture mini-quizzes (Szpunar, et al., 2013)
- Teaching others without the use of notes (Koh, et al., 2018)



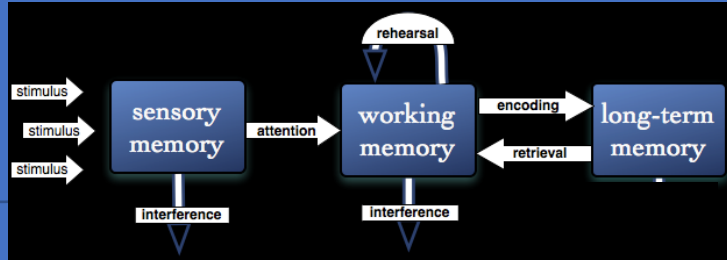
Pause and Reflect:

What is one way you could encourage students to be strategic to maximize memory in your course?



How can we help students to
be reflective and goal-
directed about their
learning?





Metacognition

(Flavell, 1979; Schraw, 1996)

“Thinking about your thinking”



- Planning your learning strategies
- Monitoring how your learning is going
- Evaluating how you did and what you'll do next time



Metacognitive learners...

- Are able to accurately assess what they already know and what needs further review
- Have an accurate sense of their chance for success
- Choose and use appropriate learning strategies for the task, often based on prior experience
- Reflect on their thinking *before, during, and after* the task

Unlike someone who is wedded to their “learning style,” a metacognitive learner is flexible!

Examples of Metacognition Activities



Give a **pre-assessment** tied to learning outcomes so students are aware of what they don't know (Nilson, 2013)



Assign **muddiest point papers** (Tanner, 2012), where students write a quick reflection on the item from class they least understand.



Ask for a **judgement of their confidence** in the answers they choose. When the test is returned, have them reflect on how their confidence judgements are related to their performance (Couchman et al., 2016).



Have students complete an **exam/assignment/paper wrapper**, where they reflect on their performance, analyzing how they'll change their strategies next time (Lovett, 2013)

See more ideas here:



Metacognition

Your Life Hack for Success in College

Have you ever been reading a textbook and suddenly realized you have no idea what you read? Have you ever received a test back and realized that you should have used a different strategy for studying? If so, you're already practicing metacognition.

Metacognition involves being aware of your own thought processes—things like:

- Planning and controlling which strategies you use to learn,
- Monitoring what you do and don't know (and what to do about it), and
- Reflecting on which learning strategies worked for you, and which didn't.

Dr. Saundra McGuire, who has written about this topic, describes metacognition like a brain outside of your real brain that's looking in to see what your real brain is doing and how well it's doing it. Some students do this naturally, but for those who don't, it can be learned. So, how can you learn to be more metacognitive? By practicing the art of *thinking about your thinking*.



Flip this page over to discover some metacognitive strategies that are used by successful college students. As you practice these strategies, do some *thinking about your own thinking* by reading more about why these strategies work. Gaining knowledge about how you learn and learning to control your own thinking is powerfully motivating... and may just be your best life hack for succeeding in college.

Want to know more? Check out these resources:

Chew, S. (2011). *How to get the most out of studying: A video series*. [<http://www.samford.edu/how-to-study>].

McGuire, S.Y. (2018). *Teach yourself how to learn: Strategies you can use to ace any course at any level*. Sterling, VA: Stylus.

Putnam, A.L., Sungkhasettee, V.W., & Roediger, H.L. (2016). Optimizing learning in college: Tips from cognitive psychology.

Perspectives on Psychological Science 11(5), 652-660.

Sample Metacognitive Strategies

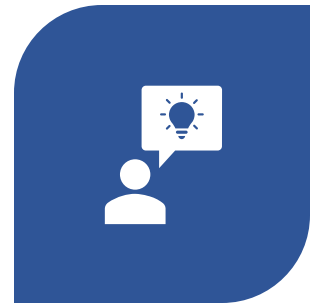
	What To Do	Why It Works
Strategies for Reading	Spent five minutes <u>skimming the reading</u> , looking at the headings and subheadings. If there are questions at the end of the chapter, see if you can answer them.	It activates your prior knowledge and helps you connect new knowledge to what you already know.
	Write <u>notes in the margins of the text</u> , noting connections with things you've learned before; summaries, diagrams, or pictures of key points in your own words; and questions you still have. Use sticky notes if you prefer not to write on your text.	It keeps you on task, and ensures that you're accessing your own understanding, rather than memorizing.
	<u>Teach someone else</u> the material in your own words.	It forces you to consider what's important, and to explain things as if the topic was new to you.
Strategies for Note-Taking	<u>Print your instructor's slides or notes</u> , if provided, and bring them to class. Take your own notes, by hand and in your own words, alongside your instructor's. Abbreviate and <u>paraphrase!</u>	It enables you to focus on your own thinking, rather than writing down everything your instructor is saying.
	Any time you encounter something you're not sure you understand, <u>star it and come back to it later</u> . If you need help understanding it, visit your instructor during office hours.	It ensures you're monitoring whether or not you understand the material, and prevents you from missing anything important.
Strategies for Test Preparation	<u>Space out your studying</u> over several days. Replace cramming sessions with short, more frequent study sessions.	It requires you to think about the information frequently, and in different ways, which makes it stick.
	<u>Use aids like flashcards wisely</u> . Don't copy definitions from the text—write them in your own words and include real-life examples.	It ensures you're not merely memorizing, and that you're thinking about how the information can be applied.
	<u>Quiz yourself</u> by predicting the questions that will occur on the test. Create a practice test, and answer your own questions (or trade with a friend).	Creating questions requires deeper thinking, and answering the questions checks your knowledge.
	<u>Re-organize and synthesize your notes</u> , combining textbook and class notes, and organizing them into charts or concept maps. Do not simply re-copy your notes!	It requires you to compare and combine information, which enables you to make connections.
Strategies for Test-Taking	<u>Make a judgement call</u> on each question. How confident are you in your answer? Star the questions that worry you, and revisit them before you submit your test.	It requires you to evaluate what you know and don't know, and gives you a record of your pattern of answers.
	<u>Predict your grade</u> before you receive your test back, then compare your prediction with the grade you receive.	It requires you to evaluate your accuracy in predicting what information is important, and which strategies will enable you to learn best.
	When your test is returned to you, spend a few minutes <u>reflecting on your performance</u> . Are there patterns to your mistakes? Which strategies worked for you? Which didn't?	Critiquing your own learning strategies enables you to plan for future changes in your study habits.

This **metacognition menu** offers suggestions for instructors seeking to embed metacognition into their courses. Note that some activities are linked to additional information about the activity.

What?	When?	Where?	How?
Pre-Assessment	Beginning of semester	Courses that build on previous courses	Create a no-stakes pre-test tied to learning outcomes so students are aware of what they don't know.
Strategy Reflection	Beginning of semester	Any course	Ask students to reflect on the strategies they've used in the past to learn similar material. Were those strategies effective? How might they be adapted for the current course?
Student Testimonial	Beginning of semester	Any course	Invite a former student who was successful in the course to share their metacognitive strategies.
Introduce Metacognition	Beginning of semester	Any course	Use a handout like the one linked here to explain metacognition and offer examples of metacognitive behaviors. If you have more time, assign Stephen Chew's " How to Study " video series for discussion and reflection.
Participatory Pedagogy (also known as Students-as-Partners)	Throughout semester	Any course, but easier to implement in small courses	Actively involve students in contributing to the curriculum, integrating and articulating their own goals
Specifications Grading	Throughout semester	Any course	Use this grading system to encourage students to plan and self-direct their

Pause and Reflect:

What is one way you could encourage students to be **reflective** and **goal-directed** about their learning in your course?

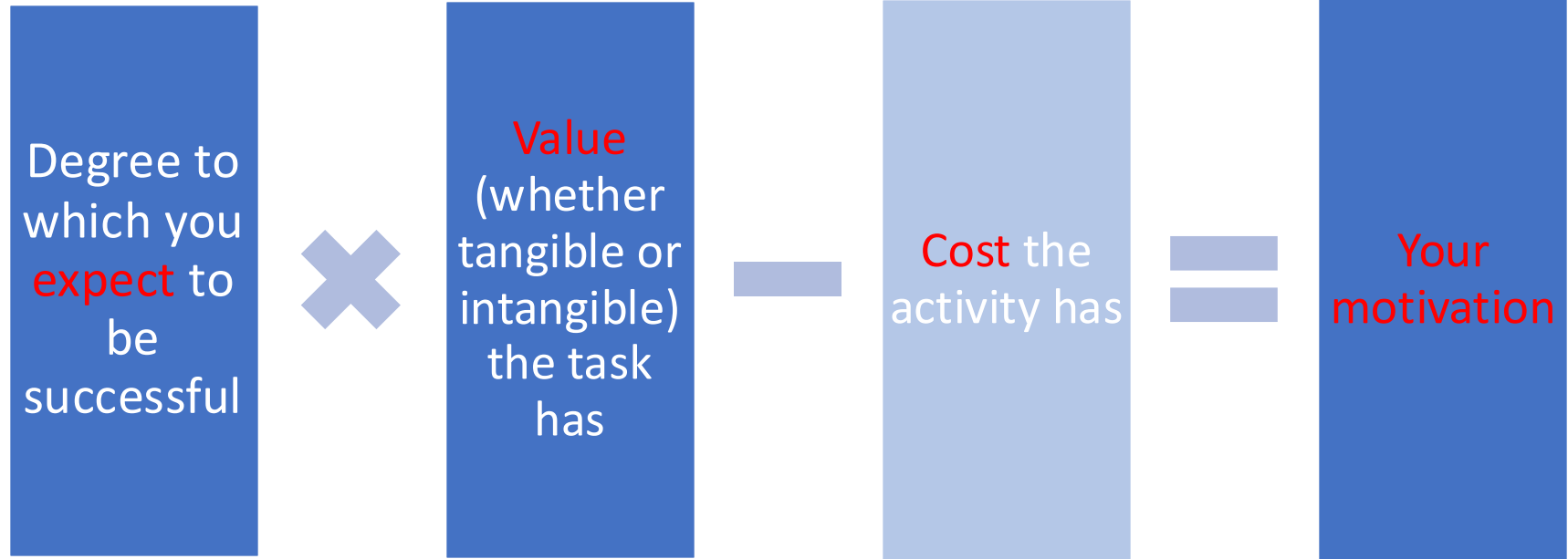


How can we help students
be mindful of their
motivation?



Expectancy-Value Approach to Understanding Motivation

(e.g., Wigfield, 1994; Flake, et al., 2015)





Examples of Ways to Increase Motivation

- Provide **mastery activities** that allow students to build up small “wins” (Betz & Schifano, 2000)
- Provide ample and specific positive **feedback** and encouragement (Vogt, 2008)
- Create **utility value assignments** that directly relate the course content to something of value to the student (Canning, et al., 2018; Soicher & Becker-Blease, 2020)
- Ask students to **reflect** on how they’ve overcome challenges, and share these reflections with future classes (Rosenzweig, et al., 2020)
- Prevent undue cost by making assignments **very clear** (TILT is a wonderful model)!



Pause and Reflect:

What is one way you could increase **expectancy** and/or **value**, or decrease the **cost** of activities in your course to increase overall **motivation**?



Science of Learning

Many teaching recommendations are based on findings from the science of learning, which has its basis in educational and cognitive psychology. [The Scholarship of Teaching and Learning \(SoTL\)](#) also often draws from and is framed by key concepts in these fields, yet for teachers and researchers outside these disciplines, the search for appropriate literature can seem very time-consuming.

If you are new to this literature, the following secondary sources may be helpful as "entry points." Scroll to the accordion list for research and meta-analyses on common topics of interest for faculty. To improve your teaching, consider introducing your students to concepts like metacognition with help from this [student handout](#), and discover ideas for incorporating it into your teaching through this [metacognition menu](#). For more information about how the science of learning can inform your teaching or SoTL projects, please contact Hillary Steiner, Associate Director for SoTL and Professor of Psychological Science.

Books and Articles:

- Ambrose, S.A., Bridges, M.W., DiPietro, M., Lovett, M.C., & Norman, M.K. (2010). *How learning works: Seven research-based principles for smart teaching*. John Wiley & Sons.
- Brown, P.C., Roediger, H.L., & McDaniel, M.A. (2014). *Make it stick*. Harvard University Press.
- Chew, S.L., & Cerbin, W.J. (2020). The cognitive challenges of effective teaching. *The Journal of Economic Education*. DOI: 10.1080/00220485.2020.1845266
- Darby, F., & Lang, J.M. (2019). *Small teaching online: Applying learning science in online classes*. John Wiley & Sons.
- Eyler, J.R. (2018). *How humans learn: The science and stories behind effective college teaching*. West Virginia University Press.
- Lang, J.M. (2016). *Small teaching: Everyday lessons from the science of learning*. John Wiley & Sons.

E-Books and Websites:

- [SoTL Annotations](#) provides a crowdsourced annotated bibliography on dozens of teaching and learning topics.
- Benassi, Overson, and Hakala's (2014) [ebook on applying the science of learning](#) offers a useful collection of chapters on a variety of topics.
- [Improve with Metacognition](#) offers information and commentary about using the principles of metacognition in the classroom.
- [RetrievalPractice.org](#) explains and promotes retrieval practice as a key aspect of learning.
- [The Learning Scientists](#) are a group of cognitive psychologists who share their insights on learning through blogs, books, podcasts, and downloadable materials.
- [Taking Learning Seriously](#) includes information, learning guides and teaching tools focused on translating cognitive science into practice.
- Elizabeth and Robert Bjork's [Learning and Forgetting Lab](#) at UCLA has a collection of excellent primary sources on learning, memory, metacognition, and more.

For a deeper dive into the science of learning literature, consider these recommended articles and books:

Learning and Studying (General)	+
Self-Regulated Learning and Metacognition	+
Attention and Multitasking	+
Learning from Mistakes and Failure	+
Retrieval Practice, Self-Quizzing and Learning-by-Teaching	+
Mindset and Motivation	+

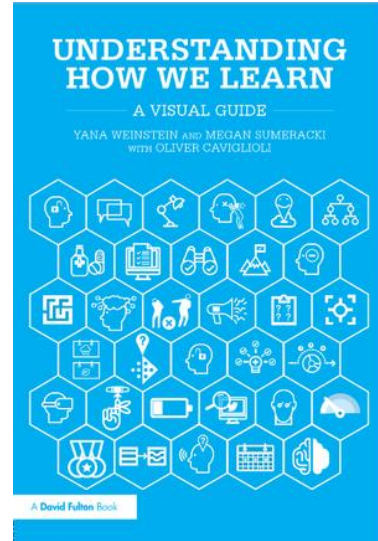
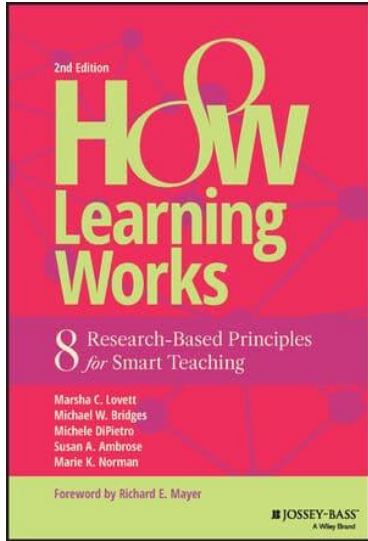
Want to learn more?



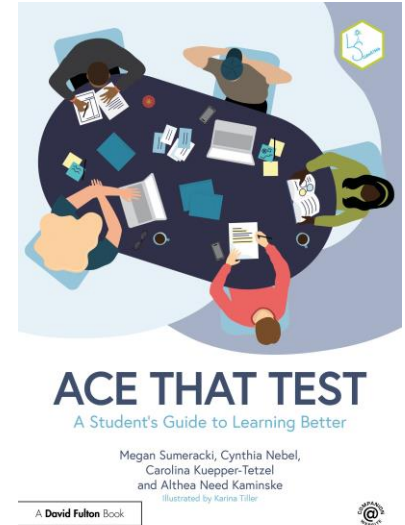
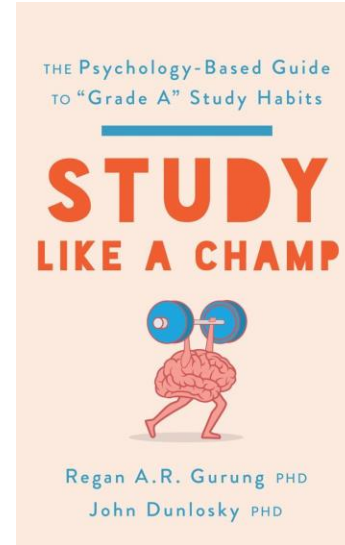
Visit CETL's [Science of Learning](#) page!

Other recommended reading:

For you:



For your students:



What will you do to encourage student success in your course?
Share one takeaway from one of the three areas:



BE STRATEGIC TO
AMPLIFY **MEMORY**



BE REFLECTIVE AND
GOAL-DIRECTED ABOUT
LEARNING
(**METACOGNITION**)



BE MINDFUL OF
MOTIVATION

Could your teaching be a potential area of scholarly inquiry?

CETL SUPPORTS FACULTY MEMBERS CONDUCTING SOTL RESEARCH IN THE FOLLOWING WAYS:

SoTL Manuscript Completion Program	Hybrid program that provides funding for participants to complete writing goals in consultation with peers and CETL staff.
SoTL Conference Presentation Funds	Competitive travel funding program for faculty whose SoTL work has been accepted for presentation at a conference.
SoTL Micro-Credentials	Digital badges that can be earned by KSU faculty, staff, and students, demonstrating varying levels of SoTL knowledge and skills.
Hopscotch 4-SoTL	A web tool that assists users in developing a well-informed SoTL research design.
SoTL Summit	An annual international SoTL conference coordinated by KSU CETL.
SoTL Listserv	A SoTL Listserv for the KSU community that provides updates on SoTL opportunities at KSU and beyond.
Directory of Journals	A directory of journals that publish SoTL research focused on college/university teaching.
Directory of Conferences	A directory of conferences that focus on college/university teaching.
SoTL Consultations	Individual and group consultations with faculty concerning any step of the SoTL process.

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