

Study, Are You Up For It? What Works and Why?

Your Own Study

What is the Goal? **Building** Knowledge in **Myself**

My Study: Is it efficient ? Does it result in A's ?

Can you remember material from last semester's courses ?

Prerequisite courses that are required before registration to upper level courses. Did you get "shallow" or "deep" knowledge in these?

Success in Upper Division courses ACTUALLY DEPENDS on my knowledge and problem solving ability of the prerequisite courses.

What is *shallow knowledge* or *deep knowledge*?

HAS ANYONE BOTHERED TO STUDY EFFECTIVE
LEARNING? How to get to 100%

What Is the Learning Curve? Forgetting Curve?

A Study of Studying Has Been Done

Experimental Setup: 4 Groups of Students (Purdue University and Washington University) study 40 Swahili/English word pairs with eight rounds of study/testing.

<u>Group</u>	<u>Study / Test Modality</u>
ST	Study all words, Test all words.
S _N T	Study only pairs missed on previous Test, Test all words.
S T _N	Study all words, Test only missed words on previous test.
S _N T _N	Study only pairs missed on previous Test, Test only words missed on the previous Test

Tests given after study session interrupted by a short “distracter task” verifying multiplication problems.

Ref: Karpicke, J and H.L. Roediger III, 2008. The Critical Importance of Retrieval for Learning. *SCIENCE* 319:966-968 (Feb 15, 2008)

The Learning Curve

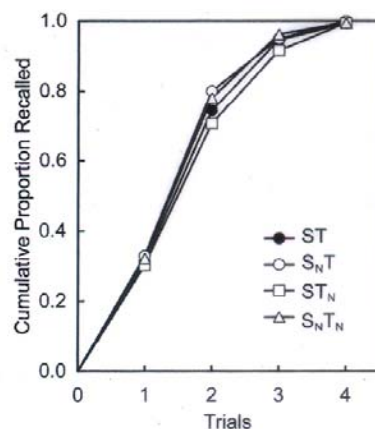


Fig. 1. Cumulative performance during the learning phase.

1. Learning to “A” level takes repeated intervals of studying and testing.
2. Four study/test sessions were required to get to 100%

What about Forgetting?

Forgetting is Affected by Study Mode

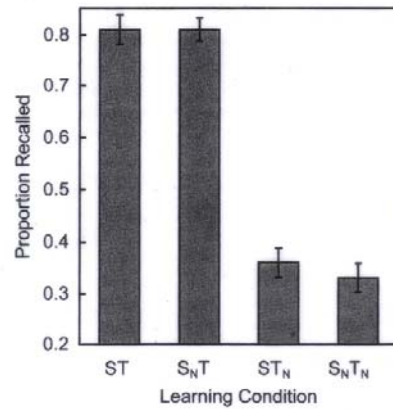


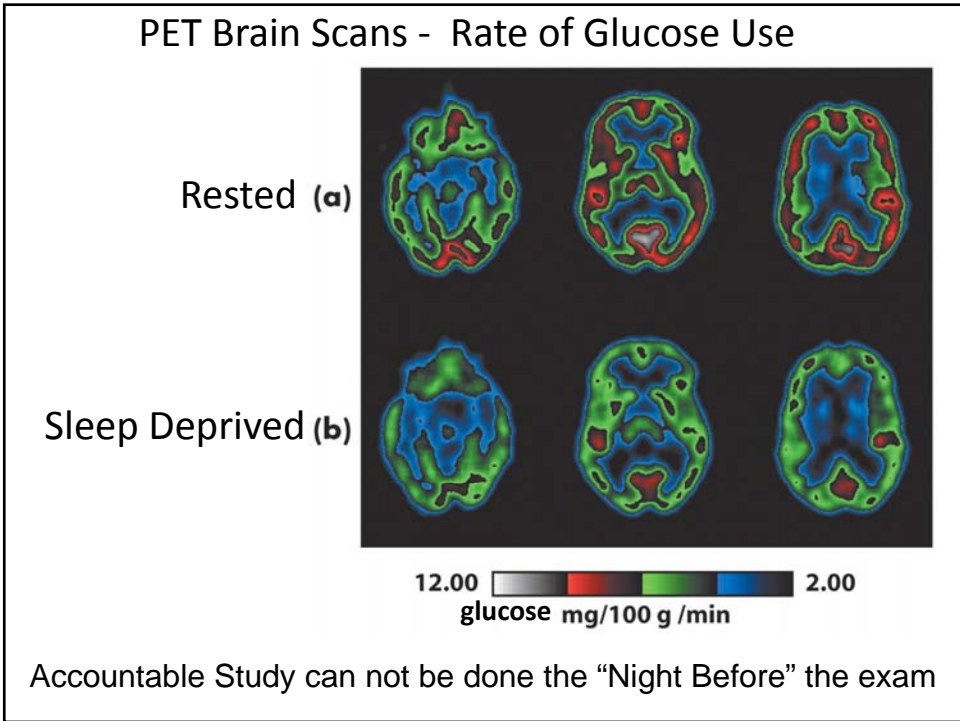
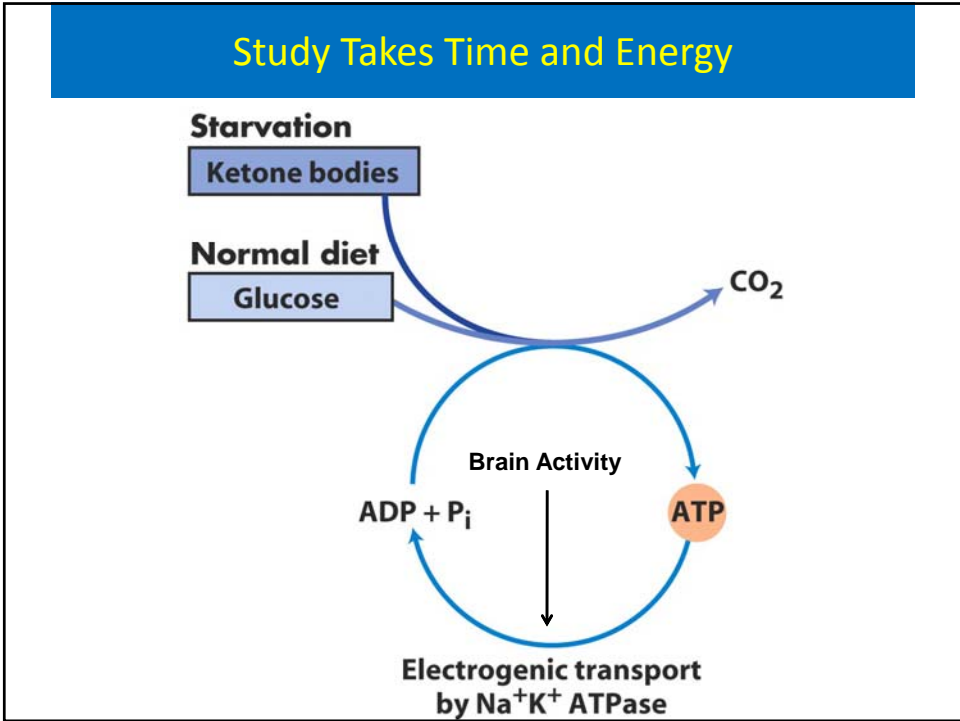
Fig. 2. Proportion recalled on the final test 1 week after learning. Error bars represent standard errors of the mean.

Test Results **a Week after** Study/Testing.

1. Repeated **Testing All** gets **Longer Term Learning**.
2. Studying missed words works as long as **Testing All** was used.
3. The difference is significant !

Testing is Really Studying with the Book Closed

1. Many instructors know that they actually LEARN from testing.
2. Testing is really a form of accountability: does my brain actually know what it has studied?
3. This form of “accountability” can be accomplished at textbook websites with practice tests (as long as they are done with the book closed), end of chapter problem sets, or other serious self tests.
4. Accountable study sets the student up to be a better problem solver. It builds confidence!



Accountable Study Can Get You To Highest Level		
Bloom' sTaxonomy	Learning Skill	Question stems...
KNOWLEDGE	memorization and recall	What is....? Who, what, when, where, how, describe...?
COMPREHENSION	understanding	What would happen if...? What does.. illustrate about....? What is analogous to....?
APPLICATION	using knowledge	How could...be used to...? What is another example of...?
ANALYSIS	taking apart information	How does...affect...? What are differences...similarities...?
SYNTHESIS	reorganizing information	What is the solution of....? Create or design a new....?
EVALUATION	making judgments	Why is....important? What is best for....? Do you agree/disagree that...?

Building Knowledge in You is Like Building a Car

Car manufacturers test and test and test (for years) before they submit cars to the ultimate test = being driven by the public.

They build cars and want them to be perfect.

You are building knowledge that you can use over and over. Do you want just enough to get b ? or get the best possible grade with useful knowledge?

Consider this:

Do you want to be operated on by a physician that "got by" courses or really knows the material?

Levels of Study

Level -100: No prep for lectures (going to lectures dumb). Miss Lectures. No study. Take exams dumb.

Level -10: No prep for lectures (going to lectures dumb). Study just before the Exam.

Level 0: No prep for lectures (going to lectures dumb). Study every week.

Level +50: Read text BEFORE lectures (going to lectures smart). Study thoroughly every week (testing your knowledge each week).

Level +100: Study text before lectures, outline how you would lecture it, then go to lectures prepared to discuss any of the material. Test knowledge each week.

Now, How are you going to Study?

1. Check your schedule - Find out WHEN you can Study.
2. Pencil in times for Group Study, Individual Study (keep in mind: you take the test, not the group = you are the most important person in the group).
3. ACCOUNTABILITY (Testing Yourself Several Times before the Exam) is only important to YOU.
4. If you planned your time well and **studied early** and **often** with the BOOK CLOSED...self testing more than once (4 times for the short Swahili test)...can result in **Deep, Analytical, Problem Solving Knowledge**.

GO FOR IT !!!