

How Long Should You Study?

Samantha KBrooks

Department of Psychological Medicine, King's College London, London, UK

Rebecca KWebster

Department of Psychological Medicine, King's College London, London, UK

Louise ESmith

Department of Psychological Medicine, King's College London, London, UK

A study was done, believe the University of Michigan, they asked students to do the following thing. When you're ready to study, you've got all your materials, you're back in your little dorm room or your place you live. Check your watch, start working, the moment you feel that sense of I've read it but it's not coming through, and it's like eh I'm wasting my time, we all get that feeling, note what time it is. Record that, bring it back. And they had many, many hundreds of freshman and sophomores do this and then somebody took the time to compile it. And typically, right about 25 to 30 minutes. By the way, it's also true of lectures and you've all proved it to yourself. You come in to a lecture, you're really alert, check the clock at about 25 after it's like...yeah. And I see it in every class I teach but how long do we teach? 50 minutes. And yet probably most of learning, if it's gonna happen, is in the first 25-30. Okay. I'm gonna talk about a person cause I also like to teach by anecdote. Woman named Janette. I was a junior at Western, she was a freshman, because I was a junior I could live off campus, those days, colleges where your parents had abstentia.

She had to live in a dorm cause she didn't have a relative in town. We were dating. She got her first quarter at Western a D average, 1.0, 15 credits of D. She decided she really needed to buckle down, plus the school said if you don't make it up you're gonna be kicked out. So the second quarter of her freshman year, she set the following goal, to study for 6 hours a night, non-stop, 6-midnight, Sunday night through Thursday night. Friday, Saturday she could party, rest of the week she was gonna study. Now one would assume, my gosh going from little study to 6 hours a night, 5 nights of the week, she should've aced everything. Want to guess her grade point second quarter? 0.0, she failed every class. This is why telling people to study more is not necessarily help. In some cases it might actually worsen their performance. What I want to do is show you graphically what I'm talking about. Let's say this is efficient studying, and I know there are no numbers there but higher means more efficient, lower means low or no efficiency. And this axis we're looking at time. Here's what happens for the average student. For her, 6 o' clock in the evening, after her supper at the residency dining hall, she plopped herself down at her little study area and started studying. Here's what happened. By about 6:30, she was in a major slump. But what was her goal? To

study 6 hours, so she continued to sit at her little desk and stare at pages until midnight. She was at her desk 6 hours. How long did she actually study? About 20, 30 minutes. Now, there's a simple concept in psychology all of you are aware of, things that are reinforced we tend to do more of. Things that are punished or ignored, we tend to do less of, and we operate by those principles to a large degree. If you are sitting there for 6 hours, are you feeling good? No. Once you get here, you're looking at your book going I hate geography, I hate literature, I hate psychology, all the things we're trying to get you to fall in love with, you're hating it.

And so her actual good studying was followed by 5 and a half hours of pain and misery. I would bet you, I don't know for a fact, that as the quarter progressed she sat down and finally she was done before she even started. She sat down and just stared at a book and she flunked every class. Now, had she taken this little seminar or had figured things out on her own, she'd know what to do. First rule, the moment you start to slide, you're shoveling against the tide. What you need to do is what? Take a break. Here's what's cool about it. You can study for a half hour. It doesn't take a half hour break to recharge your batteries. For most people about 5 minutes. This is where you go away, do something fun for 5 minutes. Call a friend, talk to a child, talk to a parent, a roommate, enjoy some music, do something you enjoy and actually say this is my treat for having studied for 30 minutes effectively. Go back, and here's what happens. Your efficiency is nearly 100%. Study a half hour, take a break, study a half hour. Had she done that over a course of 6 hours, she would have got about 5 and a half hours of serious studying and about a half hour of total break time. I really don't believe she would've flunked out. Now I get students complaining I don't have enough time to study. Look for a break at work. Look for a break at home. Those little 15-20 minutes can be very efficient if you apply them efficiently. Unfortunately, sometimes it's really tough to get those moments but you need to build them in somehow. You gotta have at least sometime to study. It's not gonna happen through osmosis. I'm gonna ask you a final question. Lets say you've studied till midnight, what do you want to do after your last study 20-30 minutes? No, not yet. You want to give yourself a big treat, okay. Whenever you're studying time is done, plan something special. Now for most women, especially with kids, it's a calgon bath with candles and the bathroom door locked and the statement if you bother me I will take your head off.

This is where guys go "what?" Yeah, moms have no privacy, kids walk in while you're using the toilet, while you're in the tub, they'll bring their friends with them, won't they? Dads don't put up with that. When dads are in the bathroom it's lock the door, tough luck, go elsewhere. For you guys, I'll give you mine. This is politically incorrect. I liked beer, kay. My goal was to knock out all my studying, go to the Iron Bull Tavern in Bellingham, knock down a couple beers for my treat. Now my buddies they'd say Lobdell how're you getting straight A's? Well I'd studied starting about 3 in the afternoon. By 9 o' clock at night, when pitchers went on cheap, I'd done all my studying. I went and enjoyed my beer. These yahoos started drinking in the afternoon, then went to the tavern planning to go home and study. You know that's not gonna happen. You're not gonna study, and even if you do, what's called state dependent memory you'll typically only remember if you're intoxicated and I don't recommend getting drunk before a test. It's kind of a stupid thing. If you plan your day right,

you can have those little study breaks but the coolest part is this. Because you're now reinforcing it with those little breaks and something fun, you extended. And you'll find you can go 30, 40, 50, an hour, an hour and a half. This is training. Those of you who go on to advanced degrees, you're gonna have to study incredible lengths of time without taking a break cause you've gotta get it done like my daughter in med school. Just amazing, I've told her I couldn't do it now, or actually I wouldn't do it. You're training yourself and if you do it right it becomes progressively easier, okay next question. How many of you have a study or library in your place of residence? Okay. 2, 2 of you if I'm seeing correctly. I've always envied that.

A quiet place to actually do reading or studying, kay. I'm gonna make a prediction. Many of you study in your bedroom. Okay, how many of you study in your bedroom? We'll raise high so everybody can see. Mmhmm, that's where I studied a lot, especially when I did go to community college. If you don't study in your bedroom hmm...I bet some of you study at the dining room table/kitchen table or bar. How many of you study at the dining/kitchen/bar? Okay. Now if you don't study in those 2 places and you don't have a study or library, study in the family room/rec room/living room...the place where your TV and stereo is, your couch, easy chair. How many of you study there? Okay. Now some of you might actually might drive to a school or library, any do that? Go to a...okay. A few of you do. I still remember living at home going to Highline Community College, my folks bought me a little desk. I still have it. Little desk, I'd come home cause I did work then at Albertsons, typically got off at 9, home about 10 and I'd start studying. I still remember reading Billy Bud Melville. I lie there sitting there studying and my eyes are just...and then the bed started calling to me. "Marty, come lie upon me." Now those of you who've studied Greek, the idea of Sirens calling sailors to the rocks, oh it's real. I'd hear the bed call me and I'd finally go oh I'll just lie down for a moment. Next thing my mom to be yelling "Marty you're late for your English class" I was like "Oh god. I didn't read Billy Bud and I'm screwed." Let me ask you, what's the primary function of a bedroom? What's the secondary function? Good. Most groups go...and I go take psych 20..or 225 and learn about it. It's functional, okay. Primary function of a dining table, eating. Primary function of a living area... Recreation, socializing, right? Now, a lot of students don't realize how much we're controlled by environmental cues. How many of you have been to the Tacoma Mall? Funny, isn't it? Why do you raise your hand? Have you ever been to Tacoma? You answered, why didn't you go like this? Why? Cause if I'm asking the entire class, you've been trained to do what? And you don't even think about it.

How many of you been Tacoma Mall? Hands go up. But if I walked up to you, Chris you ever been to Seattle? Totally stupid right? When you're talking face to face you respond verbally. When you ask a group, hands come up. Now, here's what's bad...now that I've tricked you, you won't raise your hands. I'm not gonna raise my hand. But can you see how powerful it is? Without thinking cause we're in a classroom, how many of you have been to Tacoma Mall, hands shoot up. Same is true of going in your bedroom and trying to study. You're in the bedroom. Now, piece of research done in University of Hawaii. Researchers asked the students what's the biggest problem with studying, they said we can't get into it. The university in question had primarily dorm rooms. Very few commuter students to the university. Most of you have seen a dorm room. Oh okay. Most of you have seen a dorm

room. They're usually rectangular if it's a 2 plex. One side bed, other side a bed, everything kinda mirror imaged, study area, study area, right...You've got a closet or wardrobe so it's real interesting. In one room you sleep, you groom, talk with people, you socialize, you study, you snack, you're all in 1 room. It's a multi-purpose room and yet you're supposed to study. If your door's open, what happens? Everybody "Hey Lobdell what's up?!" You know and then they got to come in and talk to very quickly you can't get to study. Well the professors heard that the students couldn't get into studying. But they knew what the dorms looked like and the Hawaiiin dorms, all of the rooms had a goose neck lamp, so the professors said we're gonna try a little experiment. Take that lamp, make a little sign and put it on it, "Study Lamp". Use it only for studying, you don't dress by it, you don't have bs sessions by it, you don't snack by it, you don't clean the room by it, nothing.

You use the other lights for all other functions. Here's the way it works and it's so easy. Every one of you can do this. Get a little lamp, probably have one already, if you don't my gosh. Yard sale, garage sale, you can pick 'em up for nothing. Get that lamp and it becomes your study lamp, so if you have to study in your bedroom, turn your desk away from the bed. That's the like how many of you been to the mall, it makes you want to go to sleep. By the way, you can't study in the bed, it's also bad for your back if you know about posture. Turn your back to the bed, have a blank wall, have your lamp, have your books ready to go cause you could futz away a lot of time getting ready, can't you? How many of can futz and futz yeah? You're ready to go, turn on the lamp and start studying. The moment you lose your edge, 15 20 30 minutes later, turn the lamp off, get up and leave the desk. What you're training yourself to study while seated there, and it becomes increasingly automatic as did the raising of the hand. You sit, turn the lamp on and you're ready to go. It's like magic. The students who did that were 1 grade point higher the next term compared to the controlled group that didn't do it. 1 grade point simply by creating a study area. Now if you study in the kitchen/dining, remove all food cues cause I know what happens there. You start thinking turkey in the fridge, yeah swiss cheese in the fridge, oh yeah sandwich time. How many of you have studied and created sandwiches, takes about a half hour to make a really good one. So damn good, what do you do? Make another one! And pretty soon not only are you not studying, but you're getting the spread going, okay. You're really frustrated then. The living area, I'm gonna tell you, you can do this experiment. You try to study in the living room and you're focused, and other people are listening to music, watching a movie, watching TV, they won't leave you alone.

"Hey Marty. Marty look, look look it's really good." "Excuse me I'm studying." And then they get angry at you. "Well boo on you too." You can't study in the living area. It's not designed for that unless you're all by yourself, and you turn off the TV, turn down the stereo so it's truly background. If you're singing along to your favorite song, you're not studying. You're singing along to a song. Your brain has to be focused to be really studying, not time sharing back and forth between singing and studying. So living areas, very tough to create but if that's what you have to do it bring your little study lamp in, everything else off, turn on your study lamp, create a study there. Are you getting the idea? Now, I'm gonna go through a lot of suggestions. Break it up into chunks, reinforce it, simple to do. Create a study area, simple to do. And you'll be amazed if you take these ideas and do them. I'm gonna make a

challenge to all of you. It's so easy to sit through a presentation, say yeah yeah that sounds good and then walk away and do nothing. Technically as a psychologist, if it doesn't change your behavior you haven't learned it. It's just in your head. To be a true learning experience you have to behave differently. So my hope is you all make a promise I'll try at least one or 2 of what I talk about today, and when you find out it works, say gosh I'll try a 3rd one, maybe a 4th. I went back to grad school in the mid-80s, second time around, I actually aced every class. PLU gives pluses, I got pluses in all but one class. I didn't do that first time, okay. I was a good student but not that good. I used the principles I learned about in teaching psych to become a student. I wish somebody had told me these things when I was a student the first time. It would have been a lot easier. So we got 2 things going. Break your study up into little pieces with reinforcement. Create a study area, if you don't have one. I think you said you do have a study. There you go.

Okay. Next thing. The more active you are in your learning, your're more effective. And yet increasingly I have students who think studying is reading it over and over and they're gonna have some magical thing where they suddenly understand it and remember it well. When your reading it over and over, or saying it over and over, the term for that is rote memorization. Spelled r-o-t-e. It can work. It is the way most of us were taught in elementary school. The way I understand it, a lot of Asian schools depend heavily on rote. Some of you may be darn good at it and if you can memorize and actually understand by repetition and its effective for you, don't change. But for most of us it's not the most efficient or effective way. The way to learn efficiently in college, first you have to decide what am I learning. Is it a concept or a fact? A fact is the discreet little piece of information, Sigmund Freud is the father of psychoanalysis, that's a fact. Okay, but understanding what psychoanalysis is is a concept. Okay. Understanding the name of a bone is a fact. Understanding what it does in the body gets into a concept, okay. So, in studying, sometimes there are a lot of facts. In fact, I use anatomy as a good example. You gotta memorize bones, muscles, organs, tissues, a lot of it. But if you simply memorize and don't understand the function of it. The comprehension of the actual concepts, it's a lot of wasted learning, really. Just to know a name of a bone is like yeah, so what. Okay. What does it do? How does it function? So, if it's a fact or a factoid, you have to approach it one way and I'll talk about how you do that. But in most college classes, what we as professors are most concerned about is that you grasp the concept. Because concepts, once grasped, will stay with you a lifetime. Facts can easily get confused, but that's why we have Google, why we have reference books. If you know the concept, you can quickly look up the fact if you have to know that for a particular fact.

Neat thing is, I get questions who has more advantage, younger students or older students? Depends on what you're talking about. Most of us as we get older realize concepts are what are really important to make our lives better, to be effective in our work, effective in our personal lives. Facts though, we realize we can lookup. We can get those if we need them. Young people actually often learn facts very quickly but they never think about the concept. I'll give you a simple example, I'm an old guy, when I was a bit younger, I would sing along with the radio with my adolescent daughter in the car. Oh Dad, if you don't know the words don't sing the song. I'd say okay Beth, you're right. I'm not singing exactly what he or she is

singing, but it's conceptually the same. What? I'd say what's the song about? I don't know. She couldn't tell me what the song was about but she could tell me every word in the song. That's earning or learning facts and not seeing the concept. I as an adult, I know the concept, I just make up my own lyrics, okay. Because I don't worry about the factual. Now, some of you are going yeah but my teacher does. I got to know the facts as well as the concepts, so we'll first deal with concepts. Here's the question, can you put the concept in your own words. If you can't, you don't really understand it. It's not meaningful to you. To make it meaningful is a struggle. It's probably the biggest struggle you have as a student. But it's a struggle you need to do or you're wasting your study time. Now I'm gonna give you an example. Only 1 of you probably in this room will understand what I just say or what we say. Ontogeny recapitulates phylogeny. I knew she would get that. How many of you know exactly what I'm talking about? Rog, you do? Cool. 2 of you. Ontogeny recapitulates phylogeny. Most of you are going it's all Greek to me, it's actually probably more Latin but I'm not certain of that. When I was a biology student, I learned about the ontogeny recapitulates phylogeny and if you try to learn that and you don't understand it, it's gonna go in one ear and out the other.

You can't hold onto it. But if I take a moment to break it down, ontogeny means your own development as a being. You as a human for example. Recapitulates means goes back through or recaptures, retraces. Phylogeny, which is the development all the way from single cell to complex mammal. Now to make sense of that, how did all of you start in utero? A single fertilized cell. An ovum that's fertilized and then it starts dividing and you get all that. But you get a little peer and this is what they first looked at embryos, where we look like a little thing that looks like a tadpole. Right? Yeah, tadpoleish. So we start with a single egg that's fertilized and then we get this little thing that looks kinda like a tadpole and they thought these were gill slits. They're not, they're just what becomes the pharisaic area. But there's no legs it looks like a little tail. We had a tail! Got the idea? Well then we get our arm buds and we get them growing you know, so we now get arms and legs and gradually we start looking more like a human being but we take an embryo of every mammal, you probably couldn't tell one from the other. Human, pig, doesn't matter, they all look very much alike don't they? Now, you understand ontogeny recapitulates phylogeny, but if the instructor doesn't take the time to tell you that and you just read it and eh whatever I'll memorize it, you would forget it about as quickly get through it. I'm not gonna prove this, you all get to do a little memory task. Gotta find where...here we go! I'm gonna read to you 13 letters from our alphabet, you all know the alphabet right? Should be meaningful. As soon as I finish I want you to say them back to me in the same sequence that I give them to you. So I'll say them and then I'll go like that, you say 'em back. Y-T-R-H, don't write 'em, A-U-S-P-D-P-A-Y-H...Boy, somebody sounded like they got quite a few but did any of you get all 13? By the way, the fact that you took notes is a good thing.

It's one of the best things to help you remember, and I sit in front of classes where they just go...for 50 minutes. I'm givin' them wisdom and they're not taking a damn note, and then they wonder why they don't remember. You can't remember everything in a lecture. I'm gonna rearrange the letters a little bit, see if you do any better. H-A-P-P-Y-T-H-U-R-S-D-A-Y. The letters in sequence. Shh... letters. Most of you got all 13, and you thought coming to

this lecture might be nothing. I've just taken your short term memory span, which is usually 5 to about 9 letters and expanded 13. Can you give 'em again? What are they? Damn you're good. Or I'm good. Now, obviously it was a little easier. Those were the same 13 letters, same ones. If you're studying anything conceptual, and you're trying to memorize it, it's like Y-T-R...it doesn't make any sense. It's in one eye out the other, if it's out loud one ear out the other. But if you take the time discover the meaning, suddenly it clicks. And I could probably ask you next week what were those 13 letters and most of you tell me. At the end of the quarter I could ask you and most of you could tell me. You might be confused was it happy wednesday or thursday but you'd guess probably thursday. Now, some of you are in my intro class this quarter. I do something that I wish I had time to do. I divide the class in 2, using a card so half reads 1, the other half reads another card. I have one group try to estimate the number of vowels in a series of words that I read to them. So they're thinking about the words, we'd say that's superficial thinking. How many vowels in mosquito? How many vowels in bottle? How many vowels in elephant? And they get to write down what they think is the number of vowels. The second group are instructed, they're told you need to think about how valuable this item would be. If you were stranded on a deserted island, and you then rate its value on 5 point scale, 1 being no value, 5 being highly valuable, that's called deeper processing.

You're now thinking about it in terms of its application or use. By the way, I think elephant is a fun one, I'd give it a 5. Not really company but if you got really hungry you got a lot of food there right? I then read, I think it's about 30 words, everybody's writing down their numbers. I then have them do a stalling exercise where they write their name phone number and address, that's to dump short term memory cause they might be thinking about the words I just read. If you're now writing your name and address, it changes your focus. Short term memory only lasts about 20-30 seconds, its pretty brief. So I counted on the clock, after 30 seconds I say now write down as many words that you can recall. This one is so powerful, the group that's counting vowels on average remembers out of about 30 words. Time and time again. The group that's thinking about usefulness on a deserted island remembers 10. It's slightly more 5/5, 5.5 vs 10.5 but very close to it doubling without doing any more effort, simply by thinking about it instead of just trying to superficially think about it. And this is where, as a student, the more you get into the understanding the better. Now this then raises a fun question, what is the meaning? If I say something is meaningful or meaningless, what am I really saying? Now I'm not gonna through a big drill which is kind of fun of teasing it out of you, but a meaningful piece is a piece that relates to something you already know, and the best little analogy is its like a file system that you've already got established, you add a new entry to it so its all neatly organized and its very easy if you got a file system to add a new entry. We do it with computers also. The other way, meaningless. It's where something new doesn't fit with something already established and so its Greek to you. Its ontogeny recapitulates phylogeny.

What did you say? If its something brand new, you can't relate it. You have to create a new entry, so you have to grapple with it saying what does that mean? But as I broke it down, I bet you could associate it with something you already understood. You've probably all seen little embryos, you got the idea of an egg, the idea that it kinda recaptures our development

from a primitive one cell to a very complex mammal, get that idea. That's the meaning of meaningfulness. Now as a teacher, I think all of us, as we are teachers we all try to make things meaningful in our classes. So we give stories, we give examples, but sometimes our examples don't work for you. This is where you have to tease it out. So I'm gonna go to a couple things to help you there. First, study groups. We underutilize them, especially in community college. Would people get through med school without study groups. Not very many. Do we have vet tech back there? Dental hygiene, vet tech, pretty sophisticated stuff they have to learn, right? Do they do study groups? No? Oh my...I would hope they do. I would encourage them to do it. Where I've got students to form study groups, performance of the groups go up dramatically. Now, part of it is probably because they're motivated to do that so its a bit confounding but I'm convinced there's also the power of studying with other people. I know these concepts its like so well I can't see how they're confusing, but another student who's just found the answer can sometimes turn and say Thursday, here's what its about. They go ah is that what Mr. Lobdell was saying, god. So easy. But I can't do that because I don't see where the problems lie in that particular concept. Study groups are great. I'm not gonna tell you how many of you totally hurt yourself in studying. How many of you magic mark, highlight, whatever you call it, textbooks. A little yellow, pink, green, glow in the dark sort of thing? How many of you use the markers? Those were invented '65, year I started college.

So I bought one. I turned entire books ugly orange. Then I figured it out. If you color your page solid orange, you've actually highlighted nothing. Yeah, by highlighting everything you've really highlighted zip. So I did the clever thing and you guys are way ahead of me. What do you highlight folks? The most important thing. When do you do it? When you first read the book right? Or the chapter. So you read through, are you studying? No, I'm reading for the most important things. Zip, zip, zip...some of you get out rulers to make it really neat, take hours to make pretty little...then you go back to the start of the chapter, you read the first thing you underlined and you go I remember that. No you don't. You recognize it. People are incredible at confusing recognition with recollection. Your visual recognition threshold is so great, you can see a person once see 'em years later and go I know you. Were you a student at Pierce College? Yeah. Did you take psych? Yeah. From Lobdell? Yeah. 36 years I run into that. Okay. Proof of this, grab a magazine in your house that you haven't looked at for a while, leaf through it, You will get the illusion of remembering virtually every advertisement and article but to prove that its not recollection, its actually recognition, before you turn to the next page predict what's on it. There's no way you're gonna be right. But as soon as you turn you go Oh! I remember that. No you don't, you recognize it. Now, going back to your book, you've highlighted the most important stuff. You now go back to study it and you say oh I remember it. So do you study it? No. So what don't you learn? The most important part of the chapter. Then they come in the next day all ready for the quiz. Oh I studied hard last night Mr. Lobdell. Here's your quiz. I don't believe it, I can't remember a thing. How many of you have heard that? Those of you teach, I could retire now if I had a buck for every one of those comments.

I don't correct 'em. I shake my head and think poor baby, you think you knew it but in fact you recognized it. You didn't know it. Now back to this active learning. How do you know

you know it? If you can look at it, go to the next one, read it, and then stop and go back to the one before, look up in the sky and in your own words say what that was about. Yeah, you know it. You will not forget it overnight unless you suffer a pretty major cerebral accident. Just doesn't happen. But while we're talking about this, most of you undo good studying by not sleeping adequate. Some of the latest work on remming, we're not sure exactly how but there's something going on that involves the hippocampus, involves the storage from a transitory long term memory to a permanent, what we call consolidation. That just labels it, doesn't really say what's happening. But we're getting increasing evidence that that consolidation process is dependent on rapid eye movement sleep, which if you're an adult happens about every hour and a half once you fall asleep. If you're not getting a good night, typically around 8 hours, you're not getting enough rem, what you've studied doesn't become permanent. I can tell you there are studies that show simply by getting better rest some students improve markedly in their performance because their brain now stores it a lot more efficiently. By the way if you know anybody with sleep apnea, biggest thing they'll tell you is I can't remember anything, my brain's shot. It's like my memory's gone. Yeah it is cause your remming isn't happening cause you wake up so often, you can't consolidate and store permanent memories. Here's the funny thing, there's no money to be made by telling people to get more sleep. So you don't hear about it on TV. Sylvian isn't telling you to get better sleep cause they don't make any money. I tell students and they go yeah that's nice but they continue to use their time for other things. It's kind of interesting, isn't it? The best advice, sleep better and most of you will do better.

Most of you won't even begin to take it. I know why. You got so many other things to do. I'd ask you this, are they important? Is studying and learning the most important thing you're doing as a student? If so, maybe you need to give up some of the other activities. I have students tell me, I don't have enough time. There's 2 what, 162 hours in a week, we all have the amount of time. Marty has no more nor less than anybody in this room. The real question is what do I do with my 162 hours. Am I gonna use it well or use it not so well? I'm gonna give you a couple other tips here. Taking notes, so vital, but most students who do it haven't learned a very simple rule. The first moment you get after a class, ideally right after the class, you should sit down with your notes, and expand on everything you jotted down. Give it depth. Flesh it out. If you even wait to go home and do it a couple hours later, you'll have forgotten some of your own notes. How many of you have done that? You've written beautiful notes, you get 'em home, you don't know what the hell you wrote. It's like what is this? Well that's a wasted note. But if you take the moment right after class to flush it out, you now have a little more detail. Odds are at night, you can still recollect it. That will be a powerful addition with only about a 5 minute time investment per class. That is a good trade off. Now, the next piece, lets say you're trying to flesh out your notes. It's like tsss...I remember they said it or he said it but I don't know what it was about. Look for a classmate, they're usually hanging around. Go up to somebody and say hey what was that about and they can tell you, or flatter the heck out of us. Teachers want students to succeed. Sometimes it isn't perceived that way. We want you to do well. Makes us happy. And any time a student comes up in the lunchroom where I always try to have my lunch and says Marty I didn't quite understand this can you give me another example.

I love it. I'm important. It's like yeah. You come to my office, not just with I'm not getting anything but what was that about when you talk about rem sleep, you know. I start explaining. That's what my life's about here okay we love it. That's a legitimate thing. Or if you don't want to go to the instructor's office, most of us start up a class, any questions? Yeah, yesterday I didn't quite understand this piece about ontogeny recapitulating phylogeny. Okay, we'll go through that quickly. Once again we like that. We want you to be successful. Let me jump back here to see where I am in my presentation. I was talking about being active. Activity can also take the form of recitation. How many of you know the best way to learn is to teach somebody else? Boy if you got family members or roommates teach 'em. Geography, psychology, anatomy, they often love it. One of my dearest students 2 years ago, god I just loved her, I finally met her parents and says I've heard so much about you, I hear every lecture you're given. She would come home, sit around the dinner table and recapitulate what I'd talked about. It's powerful because it reinforces your learning, plus it tells you if you really understood it. Cause if mom or dad says I don't quite get that, you go uh I don't understand it either, then very quickly you have to go back and redo it. Teaching another person, now some of you may not have anybody at home to teach or they're not interested. Too bad. Teach an empty chair. There's nothing wrong with talking out loud. Thinking is internal talking to a large to a large degree. Its also not talking thinking. Talking out loud as you know you doing it is not abnormal. If you think its somebody else or its a real person in an empty chair, talk with me I'll try to get you lined up with someone who can help. If you have roommates or friends say I'm just doing this little secredic thing where I'm gonna explain it to an empty chair.

Dialogue with that empty chair, practice it. Now, for some of you, writing it out in your own words is a good thing. I'm lazy, I never like to do a lot of writing but I learned very quickly to look at it, look away, and do a little dialogue with myself cause it told me if I really understood it or not. Very quickly. I would also do it with my kids, teach them as best I could. My spouse, anybody who would listen. It's a nice way of learning, active recitation. By the way, one piece of research said 80% of your study time is best spent reciting and only 20% reading. This leads to...how we doing? Ooooooh...I want to talk about textbooks. I brought the one I'm using in intro right now. Most students have not been taught how to use a textbook and yet its such a powerful tool. Because they haven't been taught the power of the tool, a large percentage don't even buy the book. In part because they're getting so darn expensive. Over 100 bucks for this little puppy here I believe. These books are designed for what's called pedagogy. That's a fancy way of saying helping you learn and they are seriously done to be at least according to the people doing it, the most effective way of teaching. But students don't know the effective way of using it. How many of you know SQ3R? None? 1, 2. I assumed all my students were still learning this until a few years ago I asked, it died out. There's also a SQ4R, there's a newer version of it which I'm not so familiar with. SQ3R: survey, that's the s. Question, that's the q. Then you have three r's, read, recite, review. And we were taught this because they knew pedagogically way back in those dark ages of the 60s that you retain much more from a text if you survey, question, read, recite and review. So, how do you do the survey? These are not novels. In a novel you wouldn't want to read the last page would you? Find out who'd done it, it'd ruin the whole

thing. But this is a textbook, so what you do is you actually go through the entire chapter, you look at pictures.

What's this about apples? What's this about a duckbill platypus? Okay. And what you're doing is you survey, you ask questions. What are formal concepts? What's a super-ordinate concept? What are natural conce...prototypes? What is a prototype? So you raise questions as you go through. It only takes a couple of minutes to survey a chapter in any class. As you're surveying, you simultaneously raise questions. What you're doing then is causing you to be looking for answers and this is a powerful thing. How many of you have noticed when you're looking through a newspaper for a piece of information, you can find it kinda jumps out at you, but if you're just kinda reading it half-hazardly, kinda casually, most of what you read you don't even remember. There's something about it, and I can't explain it, I can only describe it, if you intend to find something, you find it. And I've got a little demonstration I could've brought or actually show a placard with the words Boston and London printed on it, and I hold it up for 20 seconds. Out of a group this size, maybe 2 or 3 of you'd see Boston and London because before I do it I tell you to look for letters, symbols and numbers. I create what's called a set. You're now expecting not to see words but letters. And even though Boston and London are printed on diagonal, most people don't see it. Likewise, if you just kind of go through a book without asking questions first, you kinda skiz over the content, you don't have a search mechanism going. The reading followed by the recitation, I've talked about that, technically before a test it should be review. It should be in the barn, now you're just touching up to make sure you haven't lost anything or confused anything. But I know how this works, because we schedule tests most students don't start studying until shortly before an exam and much like my friend, it put so much time all massed together and only study for about a half hour, pull all-nighters so they don't get the good rest, come in and do poorly.

You're undoing yourself. If you start studying early, and do some of the things I've talked about, by the time you get to the test, you're just reviewing at that point, not truly studying. Use the book correctly. SQ3R. Okay, I got one last thing and I'm gonna...I'm gonna get it. You gotta memorize facts, how do you do that? And I love it because I get a lot of students from anatomy coming to me going I can't remember. What you use mnemonics. In my view, they're quicker, easier then wrote memorization and I do use them. Mnemonics come in several flavors. We have acronyms. We have the coined sayings. And interacting images. There are other types of mnemonics, technically taking notes is a mnemonic because a mnemonic is any system that facilitates recall. Most of what I've been talking about are technically mnemonics. But these are more formal. How many of you have learned that you can take letters and form a word of it, using those letters to remember certain facts? One's that come to my mind roygbv. How many of you know about roygbv? You know, those are the colors of the rainbow. Now if you're in an art class that can be important. If you're taking physics and you're learning about the spectrum of light when it goes through a prism, where you're breaking down light and anything that refracts it out like a rainbow. You know. Colors are what? Pretty easy. Now, how long would you have to work with flashcards to remember that. Now, in my intro to psych class, lets see if anybody remember affrent effrent? You can tell me. We both talk about this. Afront neurons in periphery, what do they do? From

sensory receptors toward the CNS. Efront, CNS to the effectors, muscles basically. The trouble is when you're teaching this, and this good for you to know as students, anytime two things are highly similar but not the same, you get maximal interference. That's how we talk about problems with remembering. So, you memorize it without really knowing it and you're sitting there on a quiz going oh yeah its affrent.

No, its effrent. No, its affrent. How many of you have done those flip-flops and your brain gets...and then you tell the teacher you're tricky. Its not tricky if you know which is which its very easy. But if you're confused its terribly tricky, and I just once again think oh you didn't really know it. So what I tell my students really they're both the same. Sensory are affrent, motor are effrent. Now with that little acronym, SAME, you can study very little. They're both the same. Now this where I had a student in my class say okay same big deal but I'm in anatomy and physiology. I said what's giving you a hard time? He says we're studying the heart. I said well I took a really light anatomy course, what are you studying? The left and right atrium. What is deoxidated blood and the other one's oxidated because one's on the weight of the lungs, the other one's coming back from the lungs and she said I can't keep it straight. Now that's a factoid. She understood the function of them. The concept was there but every quiz she'd flip flop. The right is the oxidated, no the left is the oxidated, buh buh buh...So I said okay, tell me which is which cause I don't know. She looked it up in her book and I've never forgot. She said the right atrium is the oxinated. Am I correct? Better be. I said can you remember radio? This gal was shocked. She's like that's not how you spell radio. I said you're correct, its an acronym. Right atrium deoxinated. Her little eyes lighted up. With one little thing, she could keep it straight. And if the right atrium is deoxinated, the left atrium is or LATO if you like LATO. I don't know its dumb. Now, this is where I put a challenge to you. Sometimes acronyms can come up, they're very easy. Now I'm gonna go with one and you can help me on this. 12 cranial nerves, give me the saying? No not the...no not that one. There's 2 of em. Some hops...Now what she just gave you were the 12 cranial nerves, the first letters, in descending, right? From the top to the bottom.

And I've never learned all of them cause I didn't take that serious but if you know ON OLD, obviously O O you're gonna have, what are they? Factory optic, and you go right down. Old Olympus Tower Top dah duh duh duh duh. Now there's another one, O O to touch and feel. I don't go there. Only women instructors get away with that one. No no no no I won't go there. If you can come up with an acronym, oh pardon me, a coined phrase...How about this? In 1492...there you go. How do you unscrew something? You turn it counterclockwise. You turn it clockwise. So I tried to teach my son this, he says no dad it's righty tighty, lefty loosey. That's another saying, its perfectly good. Its just one that I didn't know. How many days in the calendar? 30 days hath September, April, June and November. We used to learn that, they don't do it anymore. You kids have learned knuckle counting. January, February, March, April May. It'll tell you long short but it will not tell you the number of days in February nor the rule where leap year makes it 29. Little sayings can allow you to remember things very well. My very good mother just served us nine pizzas. She knows it. What are they? Planets, from the sun outward. Unfortunately, the pizza's no more. It got degraded, right, its no longer a planet. Those are the sayings. Sometimes a saying allows you to remember things. For my money though, the third one, interacting images is the best of all.

And I'm gonna draw from nutrition. How many of you've taken human nutrition? A-ha. You can tell me then, how many calories per gram in protein? Dang. Do you remember? Oh no. Its 4. By the way, some books say 4.5. Calories per gram in carbos, 4. Calories per gram in fat. That's why when you consume fats, you get twice the package there. Its why eskimos eat a lot of what? Fat. They need energy. Its why if we eat a lot of fat, we get the gut going.

I had a woman come in, sweet lady, 40 years old, crying I'm too old to learn. What? I said I'm older then you I can still learn, come on what is this? She was taking human nutrition. She understood the concept of protein, the concept of carbs, the concept of fat, and says I can't remember the details. That's typical as we get older. I said okay, you're stuck on a fact, not the concept, what are the facts? So she told me. I said okay, lets start with something easy, carbohydrates, you gotta remember 4 and only 4 to car-bo-hy-drates. Car-bo-hy-drates, starting to see? Interacting image, how syllables in the word. Just say it, carbohydrate. 4. Now, I said there's an easier one. When I hear the word carbohydrate, that first part, C A R is what? What's C A R? Car, how many wheels on a car? 4. Cars have 4 wheels, carbohydrate would have 4. Now, how many of you know about racing? You got the pro car circuit, would a pro car have 4? Just like a car. Protein, pro car, 4. Now she's starting to see what I'm getting at. Fat, fat. How do we remember 9 in fat? And she goes, that's my problem I can't remember. Well let me ask you cats, vet tech right? How many lives do they have? 9 lives. Now there's also an expression for rich people. What do we call a rich person regarding cats? Would a fat cat definitely have 9 lives? So I picture fat cats with 9 lives. This woman was almost gleed, gleefully happy. 9 calories per gram in a fat cat. Now, I've used this in classes and I try to get people to realize interacting images work even better if they're a little weird. The weirder the better actually. But if you share 'em with friends they may go Oh my god you're sick. So you may not want to share 'em all. I have a bunch and I will not share them in this class. They keep things straight in my mind but they would sound weird. But one gal came down, and it was so cute, she says Marty I have a way to remember 9. She goes I was stationed in Germany, I'd picture a very obese Fraulein looking at a bowl of strudel going nine nine.

I loved it cause its a homophone, but do you think she'll ever forget nine and fat? She'll just picture the two together. Now, the more you can create those interacting images, easier it is to remember facts. By the way, alcohol, anybody know? 7 calories per gram. How many letters are in the word alcohol? 7? And if you're a bartender, what's the classic call drink? Segrum 7 with 7 Up. They call 'em Seven 7s. Sevens everywhere. So, the more you know about Segrum Seven with 7, its like 7 calories per gram. By the way, thats also why if you drink a lot you get heavy quick. Its not very utilizable but it is energy in your body which we convert to fat fairly quickly. Okay, by the way, egg nog, fat and alcohol, yeah you can pork out almost instantly.

References

- Balaji, C., Kusuma, G. D. V., & Kumar, B. R. (2018). Impact of General Elections on Stock Markets in India. *Open Journal of Economics and Commerce*, 1(2), 1–7.
- Bodie, Z. (1976), "Common stocks as a hedge against inflation", *The Journal of Finance*, Vol. 31, No. 2, pp. 459- 470.
- Ciner, C. (2001), "On the long run relationship between gold and silver prices A note", *Global Finance Journal*, Vol. 12, No. 2, pp. 299-303.
- Côte, D. et al., 2004. The performance and robustness of simple monetary policy rules in models of the Canadian economy. *Canadian Journal of Economics*, p. 978–998.
- Datta, D., & Ganguli, S. K. (2014). Political connection and firm value: an Indian perspective. *South Asian Journal of Global Business Research*, 3(2), 170–189. doi: 10.1108/sajgbr-03-2013-0020.
- Fisher, I. (1930), "The Theory of Interest". (MacMillan).
- Franck, P., & Young, A. (1972), Stock price reaction of multinational firms to exchange realignments, *Financial Management*, Vol. 1, No. 3, pp. 66-73.
- Friedman, M. & Schwartz, A. (1963), "Money and business cycle", *Review of Economics and Statistics*, Vol. 45, pp. 52-64.
- Gurley, J. G., & Shaw, E. S. (1955), "Financial aspects of economic development", *The American Economic Review*, Vol. 45, no. 4, pp. 515-538.
- Hashemzadeh, N., & Taylor, P. (1988), "Stock prices, money supply, and interest rates: the question of causality", *Applied economics*, Vol. 20, No. 12, pp. 1603-1611.
- IDC (2015) Worldwide Smartphone Market Posts 11.6% Year-Over-Year Growth in Q2 2015, the Second Highest Shipment Total for a Single Quarter, According to IDC, [online] (<http://www.idc.com/getdoc.jsp?containerId=prUS25804315> , (19.11. 2015).
- Jochem, A. and Reitz, S., 2014. The impact of global factors on stock market movements in emerging market economies. *Intereconomics*, 49(5), pp.268-271.
- Johansen, S. (1988). *Statistical Analysis of Co-integrating Vectors*. *Journal of Economic Dynamics and Control*.
- Khanna S. (2002), "Has India Gained from Capital Account Liberalization? Private Capital Flows and Indian Economy in the 1990s", paper presented at the IDEAS Conference, International Money and Developing Countries, Dec 16- 19.
- Kumar, R. (2013), The Effect of Macroeconomic Factors on Indian Stock Market Performance: A Factor Analysis Approach, *Journal of Economics and Finance*, Vol. 1, No. 3, pp. 14-2.

Mishkin, F. S., 2007. Housing and the Monetary Transmission Mechanism.

Ortner, S. B. Resistance and the problem of ethnographic refusal. *Comparative studies in society and history*, 37(01), 1995.13.

Pethe, A., and Karnik, A., (2000), Do Indian Stock Markets Matter? Stock Market Indices and Macro -Economic Variables, *Economic and Political Weekly*, 35(5), p. 349.

Shiller, R. 1981. Do stock prices move too much to be justified by subsequent changes in dividends? *American Economic Review*, pp. 421-426.

Siklos, P. L. & Wohar, M. E., 2004. Estimating Taylor-Type Rules: An Unbalanced Regression?. SSRN.

Wen M, Lin D. Child development in rural China: Children left behind by their migrant parents and children of nonmigrant families. *Child development*, 2012.

