

What 5 things can every student (of any age) do to help themselves be more effective in class?



Barbara Oakley, Co-Instructor, Learning How to Learn, the world's largest online course.
Most Viewed Writer in Education

Okay, here's my own dirty little secret. I was never very effective in class as a student. I could focus for maybe ten or fifteen minutes, but then my attention would be distracted (*oh, shiny!*), and next thing you know, I'd have lost track of what the professor or teacher was saying. The remainder of what was generally a two-hour lecture basically consisted of me being a stenographer. I only really learned when I got away from class and could focus in my own way on the material. I'm not the only person like this. Famed neurosurgeon Ben Carson nearly flunked out of medical school until he quit going to classes and started using all the new time he had on his hands to study the material in his own way.

This is part of why I'm such a keen proponent of massive open online courses—MOOCs. (I'm a little biased, because Terry Sejnowski's and my MOOC [Learning How to Learn](#) is through [Coursera](#), but I truly believe Coursera has some of the very best MOOCs.) MOOC videos and other online videos are often designed so you can stop and replay them whenever you want. The best online materials also distil and crystallize information into discrete chunks. This is what the brain needs to help with learning. I think eventually many classes at both high school and college levels will be taught in "flipped" form, so that students listen and learn initially from videos, and then come to class to be actively inspired by instructors and classmates there as they grapple in person with the materials.

That said, students are often stuck at present with spending lots of time in class. Here are a few tricks that might be helpful for you.

1. Resist distractions. NEVER have your laptop open or your cell phone available while you are in class. Dividing your attention between what's going on in class and the more enticing materials available online is a recipe for fooling yourself into thinking you're truly focusing on the material being taught, when you're not.
2. Write your lecture notes by hand. [Research shows](#) this is noticeably more effective than typing your notes, even though handwriting is slower. Of course, this also points towards why we should [continue to teach cursive writing](#) in schools.
3. Dive actively into the material. If a professor or teacher invites you to think actively, or work actively with others to solve problems or formulate ideas in class, by all means do so! When I'm teaching engineering topics, for example, I don't do "talk and chalk" in solving problems at the front of the classroom—instead, the students are expected to work together to solve problems themselves. I notice that about a third of students don't do much heavy

Source: Quora. Quora is a question-and-answer website where questions are asked, answered, edited and organized by its community of users. The firm was founded in June 2009, and the website was made available to the public on June 21, 2010

mental lifting themselves—they prefer to sit passively and let others actively grapple with the material. These passive types are invariably the worst performers on tests.

Even if the teacher is just doing talk and chalk teaching, where they are declaiming at the front of the classroom, do the best you can to actively involve yourself in the material. Try to ask questions about what's being said, even if you don't necessarily ask those questions aloud. If you find your mind wandering, try pressing your toes against the floor to help bring you back to the here and now of the physical world.

4. Get ahead. If at all possible, get ahead in the readings, so the in-class lecture is actually the second time you're covering the material. If you are really pressed for time during a semester—perhaps you're also working several jobs outside of school—try to read and get as far ahead in the material as you can in the weeks or month before the semester begins.

An excellent idea is to go to [Class Central](#) and look up a MOOC on that subject to take in the month or so before class begins. Look at Class Central's MOOC reviews to help you make a wise choice of MOOC. Taking a MOOC will help you get a good “big picture” overview of what you'll be covering and help you to have a scaffold of knowledge to hang your learning on. This kind of early prep can prove critical in the long run.

On a more specific note, as you are walking to class, try to get in mind the key points from the last lecture, and to anticipate what you'll be covering. This helps get you in the frame of mind to be receptive to the new material you'll be learning. After the lecture, as you're walking away from class, try to [recall](#) the key points. You may think it's trivial to recall a few simple key ideas, but actually, this helps you to [chunk](#) and neurally encode those ideas so that later, you can recall and understand them more deeply.

5. Get enough sleep and *be sure to exercise*. Otherwise, nothing else you do to help your learning may matter.

There's lots more in our course [Learning How to Learn](#), and in my *New York Times* best-selling science book [A Mind for Numbers](#) (which is actually a general book on learning, with plenty of metaphors—one of my favorite learning techniques!).

[Updated Jun 5, 2016](#)

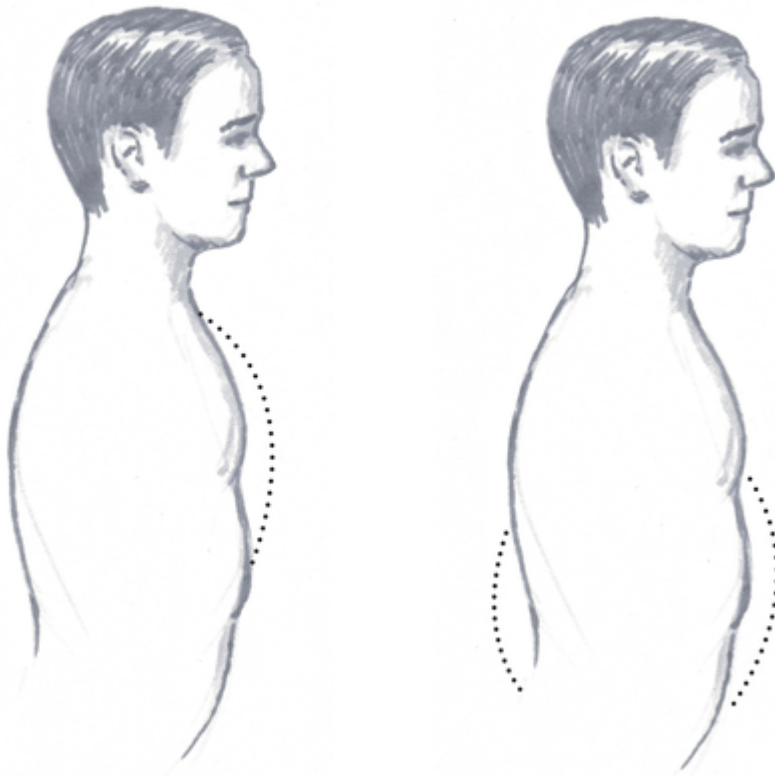
Source: Quora. Quora is a question-and-answer website where questions are asked, answered, edited and organized by its community of users. The firm was founded in June 2009, and the website was made available to the public on June 21, 2010

How can one control their nerves during public speaking or even an exam?



Barbara Oakley, I went from being unable to speak publicly to teaching millions worldwide
Most Viewed Writer in Public Speaking

The main solution to my phobia, as I discovered, lay in paying attention to the way I was breathing. I was breathing very shallowly, from the top of my chest. This doesn't bring in enough oxygen to properly oxygenate the body. The result? My body felt a feeling of panic that related much more to the lack of oxygen rather than (as I had previously supposed) to the fear of speaking in front of people. The drawing at the left below is an attempt to illustrate upper chest breathing (left) versus "lower down" breathing (right).



It's really quite a simple technique to breathe from deeper down. It almost feels fake, to breathe so that you expand from around the belly rather than around the rib cage. But it works. About 90 seconds before you're due to go on, when that "yikes" feeling of anxiety really starts kicking in, start consciously breathing from deep down, expanding your chest like a barrel. This will help to minimize that squeaky, breathless voice that often comes with the fear of public speaking—or fear of test taking! Try breathing this way in a few brief practice sessions before you have a "real deal" public speaking event or test.

Source: Quora. Quora is a question-and-answer website where questions are asked, answered, edited and organized by its community of users. The firm was founded in June 2009, and the website was made available to the public on June 21, 2010

The tips I'll give below relate more directly to public speaking.

One important issue is the context of who you are speaking for. Imagine that you are standing in front of a glass cage with a rattlesnake in it at a zoo. No big deal, right? Now imagine the glass disappears. Very big deal! It's all in the context.

You want to shape the context with which you are viewing the audience. First of all, imagine there's a pane of glass between you and them—hey, they're in a kind of different world, so it's okay to just be yourself. Next, remember that you're not there to be YOU—you're there to channel a helpful and informative message to them. *Think about their needs, not yourself.* It's okay to pretend you're someone else while you're channeling the information you are sharing. Pick whoever you'd like and admire. In my case, before I go on, I remind myself that I am channeling Joan Rivers. It doesn't matter if I'm actually conveying something very deep and scientific—Joan's my gal. She *loved* being in front of audiences. I can pretend to be that way too, at least for an hour or two, until my speech is done.

When I'm speaking, I'll get nervous sometimes inside and think—I'm so nervous! What if I say something really wrong! But I just let that thought go by and keep going. It's actually perfectly natural for those kinds of thoughts to arise. I've also discovered that if I feel really nervous inside, it's actually not visible on the outside, as long as I have my breathing under control.

On important talks, like my [TED talk](#), or the [talk](#) I gave at the National Academy of Sciences at the Sackler Auditorium, I must have practiced on the order of 70 hours each. [Nancy Duarte's TED talk](#) was a good guide to getting ready for those important events. Basically, even though I was petrified with fear inside, I'd given the talks so many times that my mouth knew what to do even though my mind often didn't. I looked casual and calm, even though I certainly didn't feel that way inside!

Those two big practice talks were great, though. They gave me a solid foundation for speaking so that I learned I could stand and speak in front of audiences, even with high pressure, without freezing. The more I speak, the easier it gets. One trick, if despite your best efforts, you still find yourself a bit panicky mid-speech, is to pause for a drink of water. Use those spare seconds as you're walking over for the glass of water to get your breathing in line.

I've found by sharing confidences in the green room before speeches, that even highly experienced speakers will go over their slides before a speech, even if they've given the speech dozens, if not hundreds, of times in the past. If they've last given the speech only a few days previously, a couple minutes of review will do. But if it's been a few months since giving a particular talk, it's a good idea to go through the talk again completely sometime during the day before, just to get those neurons all back in tune and firing. Doing the review the day before instead of the same day as the speech allows your brain time to re-synthesize and get everything properly back in mind.

Source: Quora. Quora is a question-and-answer website where questions are asked, answered, edited and organized by its community of users. The firm was founded in June 2009, and the website was made available to the public on June 21, 2010

I can't emphasize enough how important it is nowadays to have good visuals that draw people's attention. Not just a bunch of clip art, but well-made visuals that are directly relevant to what you're speaking about. Your audience will really appreciate the fact that they are getting key ideas both verbally and visually.

Becoming a good public speaker is probably one of the key life skills I've learned—it enhances everything else I do as a researcher, writer, and innovator. I try to have fun with audiences—to treat them as if they're my friend and collectively, we're sharing a joke. Surprisingly, it can be easier to speak to a thousand people than to two people. With a thousand people, you know exactly what you're going to say, and you're in control of the situation. With only two people, not so much.



Here I am in front of an audience of over 1,000 at Michigan Tech (a wonderful school!). There are two large overflow rooms not visible in the picture.

Twenty years ago, I remember looking shyly at one of my professors and thinking “I could *never* speak in front of a class like that!” And that was just a simple class of twenty students! I would never in a million years have thought that I'd eventually be prancing the stage in front of an audience of 2,000 in Jakarta with my beautiful batik, or joking around on a panel in front of 500 students in Taiwan, or madly ad-libbing fifteen minutes (probably the funniest, most informative part!) of my talk in South Africa as technicians struggled to bring up a dead connection to my Powerpoint. Incidentally, my rule of thumb is that something always will go wrong technically somewhere in a talk, no matter how carefully prepared you are, and no matter how many times you've gone through the presentation with the

Source: Quora. Quora is a question-and-answer website where questions are asked, answered, edited and organized by its community of users. The firm was founded in June 2009, and the website was made available to the public on June 21, 2010

technicians beforehand. If you think that way, the possibility of a glitch becomes a sort of running joke in your mind, and it's easy to have fun with the audience when the little (or occasionally big) glitch might finally pop up.

Sometimes I'll give three or four big speeches in a day, sometimes doubly extended because the speeches are sequentially translated. People will presume I get tired after a long day of giving speeches, and I do. But the reality is that an elementary school teacher with a full day at work generally has a more challenging day than I do when I'm giving talks.

Trust me and trust yourself that with a little patience and practice, you can be not only a good public speaker, but a great one, if that is what you would like to do. [Written Jun 3, 2016](#)

Is procrastination really that bad? Doesn't it help learning or is it a learning process too?



[Barbara Oakley](#), Co-Instructor, Learning How to Learn, the world's largest online course

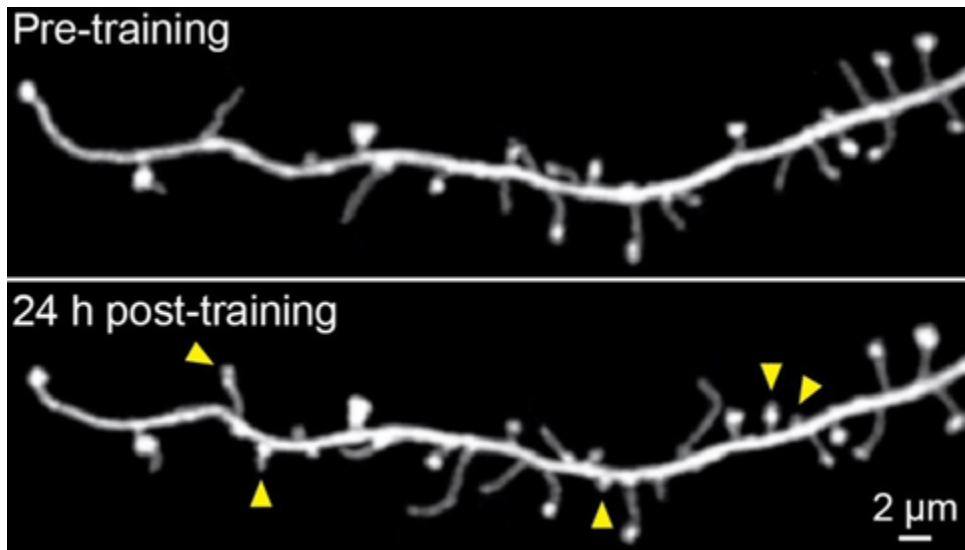
Most Viewed Writer in Procrastination

It depends on what you are procrastinating about.

Let's imagine a procrastinating weight lifter. He works out madly the night before the big meet. This is not a good idea.

Just as weight lifters practice over time to build good *muscular* structure, we want to learn gradually over time in order to build good *neural* structure.

It turns out that when you learn during the day, and then you sleep that evening, you wake up with a sort of neural upgrade. (As my co-instructor Terry Sejnowski likes to say, "It's a better deal than you can get from Microsoft.")



The above image is based on the terrific work of Guang Yang and her colleagues—the upper image shows a neuron before learning and before sleep, while the triangles in the lower image show new synapses that have formed in the EXACT SAME NEURON *after* learning and *after* sleep. (Yang, G, et al. "Sleep promotes branch-specific formation of dendritic spines after learning." *Science* 344, 6188 (2014): 1173-1178.)

When you learn and then sleep, your brain grows the neural architecture that underpins your learning!

You can only grow so many synapses in an evening. This is why it's important to space out your learning, doing a little every day, instead of cramming everything in at once. Metaphorically, in the image below, you can see how spacing out your practice over a number of days (the top calendar), builds a nice neural structure, where cramming in a single day builds a weak neural structure that allows your little metabolic vampires to more easily suck those structures away.



The upshot of all this? Cramming while you're learning is not a good idea.

Now let's take a completely different situation—like me with regards the book I'm finishing right now for Tarcher-Penguin: *Mindshift: How ordinary and extraordinary*
 Source: Quora. Quora is a question-and-answer website where questions are asked, answered, edited and organized by its community of users. The firm was founded in June 2009, and the website was made available to the public on June 21, 2010

people have changed their lives through learning—and you can too. Over the past year, I've been traveling all around the world, from Singapore to South Africa to Colombia to Canada, gathering information. In some ways, I've definitely procrastinated about synthesizing and finalizing the writing. But that's because I knew that if I started finalizing too soon, I could close my mind to new ways of understanding the great swathes of information I was collecting. Ultimately, however, my past procrastination means that I have a great deal of writing to do right now, in the last month before the manuscript is due.

You might think, well Barb, what the heck, why are you procrastinating here on Quora today instead of working on finishing your book? But guess what! Quora folks ask such great questions, in such a great way, that it is actually helping me synthesize and understand the material related to my book even better! So in this case, what can I say? Procrastination, especially when Quora is involved, can be a wonderful thing! [Written Jun 3, 2016](#)

What can parents do to help their children who struggle to learn in traditional schools?



Barbara Oakley,

First, I have to tell you a little about myself. My beloved hubby and I have two daughters who are now in their twenties. When the girls were little, I just wasn't sure of the best way to help them, educationally. I didn't want to be a "tiger mom," ramming more and ostensibly better learning down their throat and killing any potential for creative play time.

I finally settled on what I'll call the "just one thing" approach. I got to have *just one thing* that I could make the girls do outside of conventional school that *I* got to choose. The girls had to do that *one thing* whether they liked it or not—it was just a given, like brushing their teeth or going to bed at night. The *one thing* turned out to be twenty minutes a day of practice with [Kumon](#) mathematics. I wasn't perfect—sometimes we missed whole weeks at a time if we were traveling or I was otherwise occupied. But we did that *one thing* of Kumon for about ten years for each child. The result? The girls eventually felt far more comfortable and natural with mathematics than their peers in high school and college—even though they originally hadn't been natural at all with the subject.

Math as it is currently taught in the US public school systems is often problematic. There is little understanding of the importance of important approaches like [chunking](#),

Source: Quora. Quora is a question-and-answer website where questions are asked, answered, edited and organized by its community of users. The firm was founded in June 2009, and the website was made available to the public on June 21, 2010

and of course, extended periods of boring lecture don't make for good learning. (See my answer to [What makes a MOOC successful?](#)) But in today's modern technological world, having a good grounding in math can open fantastic career doors. So by placing my focus on that one little pressure point of additional practice and development of procedural fluency with math as our children were growing up, I helped make up for what I feel is one of the most challenged, yet critical, aspects of the current education system.

Incidentally, now one of our daughters just finished dual degrees *magna cum laude* in studio art and business, while the other is going off to do her medical residency at Stanford. [Written Jun 3, 2016](#)