

# Cracking the Student Success Code

8 Study Strategies Proven by Psychologists to Increase Retention and Save Time



## Intro: Bowling

No, that probably isn't the title you expected to see. Few books offering academic success tips begin with sections on bowling. Nevertheless, bowling is our starting place.

I've yet to find an illustration that provides as insightful a look into common understandings of student success like a good old fashioned game of bowling. If you don't believe me, keep reading.

I'm not a great bowler. Before we continue with this analogy, you need to understand that.

Sure I have my flashes of greatness, but overall I am confident telling you I have no bowling endorsement deals headed my way. In fact, let me clarify what I mean by *not a great bowler*. I

have occasionally scored upwards of 150 points in a game. If you are a casual bowler, you probably recognize that as a respectable score. But *occasionally* is the key word in that phrase. I have also had just as many down moments.

In a recent game against my family, I managed to squeeze out a 45. Yes, you read that correctly. No, I did not forget a 1 at the beginning. And yes, everyone I played beat me.

My wife beat me. She's no pro bowler either, but somehow she willed out the win. My brother-in-law beat me, too. He was recovering from foot surgery and could only use one leg. He rolled up on a hospital-issue scooter, jumped off on one leg, and rolled the ball without using the finger holes. And he clobbered me.

In fact, the second grader having the birthday party in the lane next over would have beaten me had we been playing head-to-head. It's a good thing for my manhood that the elementary school children were too busy playing make believe and telling knock-knock jokes to notice.

Now I know what you're thinking. You're thinking, "This guy can't be serious. No one is that bad at bowling. He has to be making this up." I wish. So why spend so much time detailing my embarrassing bowling history? It's a great picture of *inconsistency*.

**Inconsistency** is the hallmark of my bowling game. It's all over the map. I can't do anything about it. Some days I can't miss a pin, while other days I can't miss the gutter. I can think about it all I want. I can use the arrows, check my form, get advice, try different ways of rolling the ball, and it all turns out the same. There is no measurable, consistent, repeatable success involved.

I want to suggest that many people think of student success like a spotty bowling game. Just like everyone knows how to bowl (and most everyone can have the occasional good game), everyone *knows* "how to study."

But the general consensus believes success has more to do with God-given ability than scientific accuracy. Some people study well just like other people bowl well, or sing well, or whistle well, or grow over six feet tall. Success is random: an unrepeatable fluke of having a good day. There is no measurable, consistent, repeatable success involved.

I've had more students than I can count tell me they just aren't good students. Sure, they'll ace a test occasionally, but then they'll bomb the next one. Achievement is random. Some students possess the capacity to make straight A's, and other students just do their best and hope to occasionally knock down all the pins

## The Myth Exposed

Despite the general consensus that student success is like a spotty bowling game, science disagrees. Student success can be measurable, consistent, and repeatable. Students can apply the same approach time after time and expect to see the same high-achieving results.

While a particular student's capacity for success may vary depending on a number of factors, every student can experience consistent achievement by applying the right practices. That means that for all of us non-rocket scientists, we have a way of improving our current levels of student success.

In the remainder of this e-book, you will find eight of our top, scientifically-verified study tips that are guaranteed to improve your academic career. These will not replace your current set of study skills. We are not calling for abandoning your current strategies or study rhythms. But these eight tips can provide a significant boost to a student's academic approach (some even have the possibility of doubling or tripling retention in certain situations!).

As a final introductory note, please feel free to let us know about your success! Connect with us at any time so we can share your personal success story.

Happy studies!



## Study Tip #1: Self-Test

When I talk about this practice to students, I hear mixed feedback, mostly because testing has gotten a bad reputation. We actually aren't recommending students take more standardized tests but rather that every student should implement a study life characterized by self testing constantly.

If that sounds like a lot of work, keep reading. It's probably simpler than you make expect, and the benefits are significant. Although becoming an avid self-tester requires as little as two minutes per study session, the gains of those two minutes far outweigh their cost.

A [study from 2006](#) measured the impact of either studying by itself or a combination of studying and testing in an attempt to see which strategy would encourage retention the best. One group studied a passage fourteen times. The other group studied it once and took a test on it several times. The results were staggering.

Initially, the group who studied without testing scored slightly higher; however, just one week later, the group who both studied and tested over the material showed retention rates of more than **50%** higher than the study only groups.

The moral of the story should be rather easy to spot. Testing *dramatically* improves long-term retention. A another renowned psychologist, Henry Roediger III, conducted [multiple experiments](#) that confirmed these long-term retention benefits.

## Do you hate tests? Don't check out of this chapter yet.

Even if teachers haven't assigned tests, students can achieve similar retention improvements by self generating a test based on any number of factors in a learning experience.

By simply attempting to answer the questions at the end of a textbook chapter, or trying to explain what you know about a chapter subheading before reading that section, students bring the force of testing to bear on their studies. Even when students are dramatically wrong with their answers, the testing process itself pays dividends (at least when the correct answers are recognized afterward).

Making testing a habit may seem difficult, but if you choose to implement this simple strategy of asking yourself to explain the contents of a section before you read it, you'll find dramatic benefits quickly.



## Study Tip #2: Process Deeply

### What do you think about when you study?

Believe it or not what you think about while studying can change how well your study session goes. And we're not just talking to the day-dreaming students (thinking about the cute girl on the other side of the room, or the basketball game on the weekend, or what color they'll be painting their nails). Even among focused students (not day dreaming) processing information in deeper ways will boost your retention. Keep reading to find out how.

A Samford University [study and video series](#) tested the impact that a number of factors had on student success. Interestingly, many of the normal factors you may have thought were important weren't factors at all. Instead, the study found that a primary element of effective study sessions was a student *processing information deeply*.

Students may find that deep processing feels a bit unnatural and spend most of their time with *shallow processing*. Shallow processing involves focusing on things that are more or less meaningless. When students spend hours attempting to memorize vocabulary definitions

word-for-word to regurgitate them on a test, or when students re-read a text book to prep for a test, they are employing shallow processing strategies.

Scanning through notes, memorizing accent mark placement, or other similar strategies are a bit like learning to sing a song in a language you don't know. You can mouth the words, you may like the tune, but you get no meaning from the song.

Conversely, *deep processing* focuses on subjective meanings of information. When students study with a deep processing mindset, they continuously ask questions of the ideas presented. They want to know real-world applications of the information.

With deep processing, students relate what they are studying to previously held information, personal experience, or an important idea from earlier learning experiences. According to the results from the Samford study, deep processing resulted in anywhere from a **37%** to **42%** retention increase.

So, as it turns out, your opinions do matter. Having an opinion about material – a deep processing activity – can lead to better retention of that information (whether you like it or not).



## Study Tip #3: Spread out Study Sessions

Another way to state this tip is, “Quit cramming.” What psychologists call the *distributed practice effect* is one of the [most widely studied](#) and affirmed principles of student success. Nevertheless, the ubiquitous cram session continues to plague student success across the nation.

At this point, the benefits of spreading out study sessions across multiple days instead of cramming all the material into one evening are nearly self-evident: long-term retention sky rockets.

### Too much evidence to argue

Far more studies have been done than we can recount presently, but consider the results from one study in particular. A group of researchers at the University of Colorado did a test to see the impact of having a good review schedule on student retention. It's the equivalent of learning material in a study session once, then coming back to that material several days later in order to review it.

In the experiment researchers examined numerous student review schedules and found that students who implemented the optimal review schedule realized an **89.7%** retention increase over those not reviewing at all. The optimal review schedule also scored **16%** higher than the poor review schedule. That means that even reviewing assignments poorly resulted in a **61%** retention improvement over no review at all.

This seems like a somewhat common sense study tip. Most students know they need to review.

Still, many students find themselves cramming for tests rather spreading out their study sessions. The data all points one direction, though. Spreading out study sessions increases long-term retention, and overall time required may actually decrease.



## Study Tip #4: Interleave Study Sessions

Interleaving simply means (according to [Merriam-Webster](#)) to “arrange in or as if in alternate layers.” Implementing interleaving in your study session means that you mix in different material throughout the study session. This could be different subjects alternated throughout one block of time, or it could be one subject – say Algebra – but different problem types mixed together.

### An example should make this clear

Consider a student who must read and complete the problems from one chapter in her algebra book by tomorrow morning. This chapter, however, includes four different types of problems.

There are two possible approaches she can take: blocking or interleaving.

#### Blocking

If she were to block the chapter, she would read the tutorial on equation one and then do all the problems pertaining to that equation. Then she would move on to equation two and answer all of the problems related to that equation. I think you can see where this pattern is heading.

## Interleaving

Interleaving, however, takes a fundamentally different approach. Students read all four tutorials first, followed by answering all of the practice problems for all of the equations in a randomized order.

Interestingly, most of us probably learned to do work in blocks. A significant amount of research shows that by blocking out time periods to work on one particular task—what you might call *mono-tasking*—you can actually be far more productive with your time. Your focus increases, distractions decrease, and you can make headway with a unique efficiency.

But don't confuse interleaving with multi-tasking. Working in blocks of time is effective, but interleave the subject matter in those time blocks.

[A 2010 paper](#) by Rohrer, Taylor & Sholar demonstrated fantastic results from students who implemented an interleaving strategy.

While students who learned through blocking the material immediately performed better on the practice questions than those who took an interleaving approach, testing time showed a different result. Students who used the interleaving approach more than doubled the test scores of those who took the initial blocking approach. We'll call this a **40% benefit**, because more experiments need to be done on this. (A series of experiments in this area show significant—if not conclusive—benefits, but we are comfortable calling this a 40% increase, with possibilities of upwards of 200%.)

## Interleaving studies suggest two important things

### 1. Interleaving a study session may be more difficult than blocking initially.

Changing from the typical student blocking approach will likely be uncomfortable. For several days, it may not make much sense.

### 2. A little pain is worth the potential 40%+ retention improvement.

Don't cut corners on this one. Interleave your study sessions, even when it may be a longer process. Do the hard work to mix up the problem types you are working at the end of your chapters. Alternate subjects studied during one study session.

For a helpful starting place, try changing subjects every 25 minutes. While perhaps a difficult change, getting this down can help you master a new study pattern with proven results.



## Study Tip #5: Explain Concepts to Yourself

If you've ever had to stop in the middle of a paragraph, ask some questions of yourselves, and try to explain what you just read, you have probably been helping yourself more than you know.

Studies have shown that *self explanation* can be an effective means of improving certain types of problem solving, with a couple of caveats.

[In one study conducted in 1983](#) by Berry, evidence shows that self-testing had significant gains in cases of students solving abstract problems. When students studied concrete problems and solutions, there was little difference between students who involved self explanation. When abstract problems were included, however, the students who included self explanation in the midst of the learning experience outperformed those not using any self explanation by more than three times.

That's over **300%** improvement by simply stopping to explain complex, abstract problems as you study.

Other experiments confirmed the study with similar results, though students who had access to explanations for abstract problems failed to experience the same gains. Psychologists think that

these different results are the product of students who do not put the same effort into self-explanation because they have access to the material already.

The key here is that you can potentially **triple your abstract problem solving** retention by trying to explain the solutions to yourself.

Self-explanation: a simple to implement solution with serious results.



## Study Tip #6: Quit Overlearning

Two separate strategies can get you the same result: low learning and overlearning. Neither is helpful. One takes in too little information, while the other continues studying material to excess the same day it was learned.

The long-term result is the same: **wasted time**.

### An important clarification

Please don't misunderstand this. If both you and I were to be quizzed tomorrow over a set of problems whose solution we learned today, overlearning *would* help. By overlearning I mean specifically continuing to review material after you solved the problem without error.

In short-term testing situations (a week or less) over learners perform much better than those who stopped before solving the problem type error free. But in long-term situations (let's say one month from today) there is no discernible difference in scores.

The potential time benefits here are tremendous. Consider two students for example:

**John** over learns his math every week. He's dedicated, hard-working, and he makes sure he does extra practice problems even after he answers the problem types correctly. John doesn't spend too much time on this, but let's call it an hour every week spent in over learning time.

**Sue**, on the other hand, practices just enough to answer every problem type correctly. After she's answered them correctly, she stops working on those problem types. While John continues practicing, Sue reviews the previous week's assignments. What John spends in overlearning time, Sue spends in review time.

Hopefully this imaginary (but all too plausible) situation gets our point across.

The cost of overlearning may be hours of work that could be saved by simply trading overlearning time for review time.

If you need any more evidence for the benefits of review time across multiple study sessions, check out Study Tip #3 one more time: spread out study sessions.



## Study Tip #7: Take Study Breaks

Time to celebrate! Psychologists have proven that you should get a break in the middle of a study session.

[In the same study](#) that examined the effects of overlearning, psychologists also studied whether or not spacing—we'll just call it “taking a study break”—has beneficial effects. Thankfully for every student who enjoys a good snack break during a two hour history study session, the study shows that the right kind of breaks do in fact have positive effects.

[The study](#) tested two alternative approaches: **spacing** and **massing**. The concept is simple. If you have two hours that you'll need to study in one evening, *massing* means you study for two hours straight and *spacing* means you study for one hour, take a break, and then study for another hour.

### The results? 50%

The experiment found that in a math class, students experienced about a **50% improvement on the test** by adding a simple break in the middle of their learning experiences. Students who

used spacing scored an average of **77%** on the test, while students who took the massing approach scored an average of **49%**.

## Applying the Principle

Many of the variables surrounding these breaks still need to be examined. Generally speaking, though, students retain more information long-term by taking a break of 10-30% of your study session length. That means if you spend 50 minutes studying, you can take between a 5 and 15 minute break before hitting the books again.

If you take breaks any longer than that, you'll probably begin to experience a lowered retention that wipes out the benefits of the break itself. Nevertheless, spacing your study sessions will improve retention. Do the work, take a break, and do some more work. In the long run, you'll save significant time studying this way.



## Study Tip #8: Summarize or Take Good Notes

For the final tip of this ebook, consider the impact of summarizing and taking good notes. While potentially the most frequently prescribed remedy for low student performance, the actual benefits of both of these strategies are rarely discussed. Studies show that while these two strategies are effective, there are important considerations to keep in mind when taking notes and making summaries.

[In a 1979 study](#) by Bretzing and Kulhavy, a number of students were given a passage to read and then tested on the material. The study measured the effects of both summarizing and note-taking.

Students who recorded a summary of the material did approximately 20-25% better than those who read the passage without recording anything. And students who took notes without summarizing the passage performed at about the same levels as those students who had summarized the passage.

In short-term results, note-taking and summarizing showed about the same effect: 20-25% increased retention. The only measurable difference shows up when comparing length of retention: note-takers tested slightly worse than those summarizing the material in long-term retention.

In a recent report by a group of people with too many degrees to count, some of these gains from summarizing are downplayed, and with good reason. Good summaries help, but poor summaries may actually hurt.

In one test about two thirds of the students tested were found to have summarized the material incorrectly. Understandably, those students didn't experience positive benefits from summarizing. It would be a bit like a sportscaster reporting that the wrong team won. That guy doesn't get to stay a sportscaster because, unfortunately, he never mastered summarizing.

## StudyRight's Recommendation

Based on the data surrounding these questions, we encourage a two-fold recommendation to get the maximum benefit from summarizing and note taking:

First, take great notes that record all of the big ideas and key details of a particular learning experience.

Second, summarize those points well and in your own words.

Taking notes helps you identify the important information. This is key. If you miss the details that make the passage move forward, you cannot summarize it well.

After you've identified the right information, summarizing helps you organize those ideas for long term retention and total test domination. While it may take a few tries to master the art of summarizing, the possible 20% improvement is worth the extra time to take great notes and produce a quick summary.



## Epilogue: Moving Toward Success

The purpose of this ebook is simple: we want to give students simple, proven strategies that can make a significant difference in their lives.

At StudyRight, we want to ensure all of our recommendations are simple enough to be implemented by anyone, practical enough to get started today, and data-driven so that we are not just putting our opinions into the ring. As you've noticed throughout this ebook (hopefully), every strategy we discuss has research based evidence that it improves retention and saves time.

The next step is to begin implementing some of these principles. We'll recommend two steps for moving forward: implement one strategy per week and enlist a friend to hold you accountable.

### Implement one strategy per week

Eight strategies may take some time to master. Any new approaches do. However, the next right step today is to begin implementing one strategy a week and build on it as you go. Becoming an effective learner is a life-long journey, but consider the following page for some potential starting points.

## Tips to implement each strategy

**Self-Testing:** Try to answer the questions at the end of each textbook chapter before you ever read the chapter itself. Ask yourself the questions again at the end and see if you do better.

**Processing Deeply:** Create a list of four or five questions you ask every time you study and set an alarm to ask them every 15 minutes.

**Spread out Study Sessions:** Schedule four days to study for every test you take. You don't necessarily need to spend a large portion of time each day, but spreading out your study sessions will help anyway.

**Interleave Study Sessions:** Set an alarm to change up the subject you are studying every 25 minutes. Retention will increase by this mixture of material.

**Explain Concepts to Yourself:** Every two pages you read, ask yourself to explain in under 20 seconds what you just learned.

**Quit Overlearning:** After you finish a practice problem type without having to stop and look up the process, stop studying those question types and instead review last week's problem types.

**Take Study Breaks:** Set a timer that will help you stop every 50 minutes for a 10 minute study break.

**Summarize or Take Good Notes:** After every class period, summarize your notes on a notecard without looking back at your handwritten notes.

## Invite a friend to hold you accountable

Nothing helps you continue moving forward like a good friend who knows your goals and doesn't let you back down. If you're serious about implementing some of these proven strategies that will save you time and improve your retention, you should be just as serious about inviting others on the journey. Who knows? Perhaps they'll gain some skills in the process too.

For more simple, student centered, data-driven resources, check out [www.studyright.net](http://www.studyright.net).

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