

学习的十大好习惯和坏习惯

《Learning How to Learn: Powerful mental tools to help you master tough subjects》

是 UCSB 在 Coursera 上开放的一门热门公开课，介绍如何学习方法论。下面翻译一下课程介绍的学习十大好习惯和坏习惯。



摘录：数字思维：如何在攻克数学和科学，by Barbara Oakley, Penguin, July, 2014

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十个好的学习习惯 Ten Rules for Good Studying

1. Use recall. After you read a page, look away and recall the main ideas. Highlight very little, and never highlight anything you haven't put in your mind first by recalling. Try recalling main ideas when you are walking to class or in a different room from where you originally learned it. An ability to recall-to generate the ideas from inside yourself-is one of the key indicators of good learning.

回想。当你读完一页的时候，抬起头，望向远方，回忆刚刚所读的主要内容。在回想时，强化你记住的少部分内容，而非那些你尚未记住的东西。你可以在去上课的路上或者在不同的教室回想你所学到的主要观点。具备回想的能力—即从你的脑中自发地生成想法—是好学习习惯的关键指标。

2. Test yourself. On everything. All the time. Flash cards are your friend.

自我测验。针对任何内容，在任何时间，都可以进行自我测验。利用卡片进行自我测验是非常有效的。

3. Chunk your problems. Chunking is understanding and practicing with a problem solution so that it can all come to mind in a flash. After you solve a problem, rehearse it. Make sure you can solve it cold-every step. Pretend it's a song and learn to play it over and over again in your mind, so the information combines into one smooth chunk you can pull up whenever you want.

把问题组块。组块(Chunk)是指将若干较小单位联合而成熟悉的、较大的单位的信息加工。通过对某一个问题的求解方法进行理解和练习,使自己能够马上想起整个求解方法的全部内容。确保你可以完全掌握求解过程的每一步。假如这是一首歌,学着去在大脑中一遍又一遍地练习,这样信息就会联合为一个连续的意元/组块。而且,你可以随时将整个信息提取出来(想起整个解决方案)。

4. Space your repetition. Spread out your learning in any subject a little every day, just like an athlete. Your brain is like a muscle-it can handle only a limited amount of exercise on one subject at a time.

分时分段进行学习。就像运动一样,对于任何主题/科目,每天只学习一小部分内容。因为大脑就像肌肉,一次只能就一个主题/科目进行有限数量的练习。

5. Alternate different problem-solving techniques during your practice. Never practice too long at any one session using only one problem-solving technique-after a while, you are just mimicking what you did on the previous problem. Mix it up and work on different types of problems. This teaches you both how and when to use a technique. (Books generally are not set up this way, so you'll need to do this on your own.) After every assignment and test, go over your errors, make sure you understand why you made them, and then rework your solutions. To study most effectively, handwrite (don't type) a problem on one side of a flash card and the solution on the other. (Handwriting builds stronger neural structures in memory than typing.) You might also photograph the card if you want to load it into a study app on your smartphone. Quiz yourself randomly on different types of problems. Another way to do this is to randomly flip through your book, pick out a problem, and see whether you can solve it cold.

在练习过程中交替使用不同的问题求解方法。永远不要在某一个任务中只使用一种问题求解方法,因为这样的话,过一段时间之后,你不过是在模仿求解前一个问题所做的事情。应该把问题混在一起,同时做不同类型的问题。这不仅能教你如何使用某一种方法,还会教你应该何时使用该方法。(书籍通常不是这样设定的,因此你需要自己去做这件事。)在每一次作业和测试结束后,检查你的错误,确保你懂得为什么犯错,然后重新求解。为了最为有效地学习,可以把问题写(不要打印)在记忆卡的一侧,把答案写在另一侧。(与打印相比,手写能够在记忆中构建更为强健的神经结构。)你还可以对卡片拍照,然后加载到手机中的学习 APP 中。然后随机地对自己提问不同类型的问题。或者,你可以随机翻阅书籍,找一个问题,看看自己是否能够完全正确地解答它。

6. Take breaks. It is common to be unable to solve problems or figure out concepts in math or science the first time you encounter them. This is why a little study every day is much better than a lot of studying all at

once. When you get frustrated with a math or science problem, take a break so that another part of your mind can take over and work in the background.

经常休息。在数学和科学领域，当你第一次遇到某一个问题或概念时，可能无法解答或理解。这是很正常的。这也是为什么每天学习一点儿比一次学习很多东西要好得多的原因。当你对某一个数学或科学问题感到失望或厌倦的时候，休息一下，这样你大脑中的其他部分会接管这一问题或概念，并在潜意识中运转。

7. Use explanatory questioning and simple analogies. Whenever you are struggling with a concept, think to yourself, How can I explain this so that a ten-year-old could understand it? Using an analogy really helps, like saying that the flow of electricity is like the flow of water. Don't just think your explanation-say it out loud or put it in writing. The additional effort of speaking and writing allows you to more deeply encode (that is, convert into neural memory structures) what you are learning.

使用解释和简单的类比。当你疲于应付一个概念时，问一下自己，如何能把它给一个10岁儿童解释清楚？比喻确实有帮助，比如你可以说电流就像水流。不过不要仅仅在脑子里想，要大声说出来，或写下来。通过努力去说或写，可以把你所学的东西更进行更深入的编码（即转换成神经内存结构）。

8. Focus. Turn off all interrupting beeps and alarms on your phone and computer, and then turn on a timer for twenty-five minutes. Focus intently for those twenty-five minutes and try to work as diligently as you can. After the timer goes off, give yourself a small, fun reward. A few of these sessions in a day can really move your studies forward. Try to set up times and places where studying-not glancing at your computer or phone-is just something you naturally do.

专注。关闭手机和电脑上所有的消息提醒，然后打开一个25分钟的定时器。在25分钟内，心无旁骛，完全专注，尽可能努力地工作。计时器结束后，给自己一个小的、好玩的奖励。（注：每一个25分钟的专注工作可以认为是一个会话 *session*。）每天进行几次这样的会话，可以实实在在地推进你的学习。而设置合适的的学习时间和场所——确保不会瞥到你的电脑或手机——是轻而易举的事情。

9. Eat your frogs first (注：Do your worst task first thing in the morning.) Do the hardest thing earliest in the day, when you are fresh.

先难后易。在一天中最清醒的早晨，把最难的任务解决。

10. Make a mental contrast. Imagine where you've come from and contrast that with the dream of where your studies will take you. Post a picture or words in your workspace to remind you of your dream. Look at that when you find your motivation lagging. This work will pay off both for you and those you love!

勿忘初心。想想你从哪里来，学习又会将你带到哪里去。在工作空间贴一张图或一段文字，提醒你你的梦想。当你感觉自己缺少动力的时候，就看一看它。这会让你重新燃起激情，取得成功！

Ten Rules of Bad Studying 十个坏的学习习惯

Avoid these techniques—they can waste your time even while they fool you into thinking you're learning!

避免以下这些学习方法。它们会浪费你的时间，甚至欺骗你，让你以为你在学习！

1. Passive rereading—sitting passively and running your eyes back over a page. Unless you can prove that the material is moving into your brain by recalling the main ideas without looking at the page, rereading is a waste of time.

消极地重复阅读—消极地坐着，眼睛盯着同一个页面来回看。除非你能在不看这一页的情况下，在脑中回想起主要内容，以证明页面上的材料/信息都进入了你的大脑，否则重复阅读只是在浪费时间。

2. Letting highlights overwhelm you. Highlighting your text can fool your mind into thinking you are putting something in your brain, when all you're really doing is moving your hand. A little highlighting here and there is okay—sometimes it can be helpful in flagging important points. But if you are using highlighting as a memory tool, make sure that what you mark is also going into your brain.

太多标注。高亮标注文字会欺骗你，让你以为你正把东西存入你的大脑，然而你所做的其实只是在移动你的手。在文本上做少量高亮标准是可以的——它有时可以帮助标记重点。但是，如果你将高亮标注作为记忆的方法，一定要确保你标记的内容也进入了你的大脑。

3. Merely glancing at a problem's solution and thinking you know how to do it. This is one of the worst errors students make while studying. You need to be able to solve a problem step-by-step, without looking at the solution.

不要盯着一个问题的答案看，然后以为你知道该怎么做。这是学生在学习时犯的最糟糕的错误。你需要能够在不看答案的情况下，一步一步地求解问题。

4. Waiting until the last minute to study. Would you cram at the last minute if you were practicing for a track meet? Your brain is like a muscle—it can handle only a limited amount of exercise on one subject at a time.

临时抱佛脚。如果你是在为田径运动会锻炼，你会临时抱佛脚么（最后一刻才开始练习么）？因为大脑就像肌肉，一次只能就一个主题/科目进行有限数量的练习。

5. Repeatedly solving problems of the same type that you already know how to solve. If you just sit around solving similar problems during your practice, you're not actually preparing for a test—it's like preparing for a big basketball game by just practicing your dribbling.

反复解答（你已经知道求解方法的）同一类问题。如果你在练习过程中，只是坐在那里解决类似的问题，你实际上并不是在为考试做准备——这就像你要为篮球赛做准备时，却只在练习运球。

6. Letting study sessions with friends turn into chat sessions. Checking your problem solving with friends, and quizzing one another on what you know, can make learning more enjoyable, expose flaws in your thinking, and deepen your learning. But if your joint study sessions turn to fun before the work is done, you're wasting your time and should find another study group.

把学习小组变成聊天小组。和你的朋友互相批改答案，针对各自所知道的内容互相提问，可以让学习更有趣，发现你想法上的缺陷，加深对学习内容的理解。但是，如果你的学习小组在完成学习任务前就开始娱乐，那么你就是在浪费时间，并且应该换一个学习小组。

7. Neglecting to read the textbook before you start working problems. Would you dive into a pool before you knew how to swim? The textbook is your swimming instructor-it guides you toward the answers. You will flounder and waste your time if you don't bother to read it. Before you begin to read, however, take a quick glance over the chapter or section to get a sense of what it's about.

不读课本就开始回答问题。你会在不知道如何游泳的情况下就跳入泳池么？课本就相当于你的游泳教练——它引导你找出答案。如果不阅读教材，你可能会陷入困境，并且浪费时间。不过，在开始阅读前，扫读一下章节名以便了解相关章节是在关于什么的。

8. Not checking with your instructors or classmates to clear up points of confusion. Professors are used to lost students coming in for guidance-it's our job to help you. The students we worry about are the ones who don't come in. Don't be one of those students.

不和老师或同学进行讨论以理清困惑点。教授是用来给有疑问的学生进行指导——帮助学生就是教授的工作。教授担心的是那些有疑问却不来讨论的学生。不要做这种学生。

9. Thinking you can learn deeply when you are being constantly distracted. Every tiny pull toward an instant message or conversation means you have less brain power to devote to learning. Every tug of interrupted attention pulls out tiny neural roots before they can grow.

认为心烦意乱时还能深入学习。每发送一条讯息或短信，都意味着你可以投入到学习中的大脑能量变少了。每一个干扰都会阻碍神经连接的生成（记忆的本质是在大脑中形成新的神经连接）。

10. Not getting enough sleep. Your brain pieces together problem-solving techniques when you sleep, and it also practices and repeats whatever you put in mind before you go to sleep. Prolonged fatigue allows toxins to build up in the brain that disrupt the neural connections you need to think quickly and well. If you don't get a good sleep before a test, NOTHING ELSE YOU HAVE DONE WILL MATTER.

睡眠不足。当你睡觉的时候，大脑会将问题与解法进行整合，并且会练习和重复你睡前记住的所有东西。过度疲劳会在脑内产生毒素。这些毒素会扰乱和中断神经元之间的连接，使你无法敏锐的思考。如果你在考试前没有一个好的睡眠，那么你（为考试或学习）做的其他任何事情都没有意义了。