Enhancing Ineffective Learning Strategies

Surveys indicate that college students use both effective and ineffective learning strategies. Because your strategies may be well-established habits, it may be difficult to change or replace ineffective with more effective strategies. One group of researchers suggests that rather than give up your preferred strategies, you could learn to use them more effectively (Miyatsu, Nguyen, & McDaniel, 2018). Their recent research explores five popular learning strategies:

1. Rereading
2. Highlighting/underlining
3. Note taking
4. Outlining
5. Flashcards

College students use these strategies quite frequently as indicated in table 1 below.

Table 1. Meta-analyzed frequency of the use of the five popular study strategies*.

Rereading	Highlighting	Note-taking	Outlining	Flashcards
(*n* = 1,517)	(*n* = 1,517)	(*n* = 595)	(*n* = 595)	(*n* = 842)
78%	53%	30%	23%	55%

Pitfalls and Recommendations for Each Strategy

Rereading

- Rereading immediately after an initial reading is ineffective. Students who read one time do no better on tests than students who read and then reread immediately. If you plan to reread material don't do it immediately after your first reading.
- Rereading is most effective if there is a time lag between the two readings, e.g., from several hours to several days.
- Rereading more than one time does not improve learning. Time would be better spent using a more effective strategy like self-testing or explaining the material to yourself.
- Students develop a false sense of knowing from rereading. As you reread and become more familiar with the material, you may assume you understand it and that you will be able to remember it in the future. This is the "illusion of knowing."
- To enhance the effectiveness of rereading, space out your rereading and test yourself over the material. For example, before you reread something write down everything you remember from the first reading. Or, create a list of questions after reading the material for the first time, and then try to write answers to the questions just before you reread the material.

Highlighting/Underlining

- Highlighting works in that you tend to remember more of what you highlight than do students who only read the material. You also tend to remember more of what you highlight and less of what you don't highlight.
- Indiscriminate highlighting doesn't work. Highlighting tends to be ineffective if you mark either too little or too much of the material.
- Highlighting what is already highlighted won't improve learning. You probably already know this; most textbooks already highlight key concepts and material.

- Recommendations about highlighting.
  - Read through the material **before** highlighting. Instead of highlighting as you read, first read and then go back to highlight key ideas.
  - Pay attention to how the text material is organized. Note how the highlighted material relates to the topic or section of the text.

Note-taking

- Generative note taking is better than verbatim note taking. Generative note taking involves identifying the gist of the information. Verbatim note taking involves transcribing what the teacher says or what is written on slides.
- Note taking is ineffective if you merely copy information verbatim and never review it.
- There are two ways to enhance learning from note taking:
  - Generative note taking involves recording the gist of the information. Recording the gist might mean condensing the information and putting it in your own words, drawing diagrams, organizing the information in a specific way, noting questions or gaps in understanding, etc.
  - Reviewing notes. The effectiveness of note-taking increases substantially if you review your notes
- Recommendations:
  - Use generative note-taking, e.g., summarizing, outlining
  - Review your notes

Outlining

- Outlining is an opportunity to learn by identifying and organizing key information.
- Teacher-generated outlines benefit learning whether presented before or after studying.
- Learner-generated outlining benefits learning only if students are trained in outlining.
- Successful outlining training emphasizes identifying main points after reading through a section, identifying the text structure and using the outline to cue retrieval of the text contents.
- Skeletal outlines provided by the instructor can guide students to produce more effective outlines of their own. These are more effective than giving students a fully developed outline by the instructor.
- Outlining is ineffective if you create an outline from scratch and disregard the text structure.
- Outlining is more effective if you read through the text, and then identify the major points and attend to the organization of the material.
- Instructors should provide skeletal outlines before class, e.g., list of key topics and overall structure.
- Recommendations:
  - Use skeletal outlines if your instructor provides them.
  - Learn how to outline -- identify main points after reading through a section, identify the text organization and use the outline to cue retrieval of the text contents.

Flashcards

- Using flashcards is a form of self-testing, i.e., retrieval practice
- Flashcards can be effective for retaining specific, detailed information, e.g., foreign vocabulary, concept definitions, medical terms.
- Researchers view retrieval as a process that enhances learning and retention. Students tend to view flashcards as a way to determine how well they have learned material.
- Students should continue to practice recalling information even after they are able to get it correct. Recalling information more than one time enhances memory significantly.
- Spacing flashcard use enhances memory. You should not continue to drill the same item but to take a break and come back to it later.
- Pitfalls.
    - Knowing when to drop a flashcard. When students regulate their own flashcard usage they drop flashcards too quickly which limits their learning.
    - Difficult to use flashcards to learn complex knowledge, e.g., how to apply concept, how to integrate ideas, make inferences.
- Recommendations. You should
    - continue self-testing even after you get an item correct
    - space out your study of given flashcards.

Table 2 (Miyatsu, Nguyen, & McDaniel, 2018) summarizes the main outcomes of five popular study strategies (rereading, highlighting, note-taking, underlining, and flashcards) in terms of (a) common pitfalls, (b) tips for optimal implementation, and (c) effectiveness for different test types.

Table 2. Common Pitfalls, tips for optimal implementation, and effective test types

Strategy	Common Pitfalls	Tips for Optimal Implementation	Test Types*	
			Factual	Application
Rereading	× Mistaking the fluency associated with a second reading as having learned the material successfully.	✓ Space out the readings. ✓ Test yourself in between the readings.	Yes	No
Marking	× Marking too little; marking non-critical information. × Mindless marking (frequent users need to be careful)	✓ Read through the text first before marking. ✓ Pay attention to the text structure when identifying important information to mark.	Yes	No
Note-taking	× Copying lecture notes verbatim and not reviewing them.	✓ Make sure to review the notes before an exam.	Yes	Yes
Outlining	× Outline from scratch without paying attention to the text structure.	✓ Identify the main points after reading through the whole section. ✓ Pay attention to the text structure. ✓ Use skeletal outline as a guide.	Yes	Yes
Flashcards	× Dropping flashcards from study after one successful retrieval.	✓ Retrieve an item correctly at least three times before dropping it from study.	Yes	No

* Yes/No on Test Types indicate whether there is empirical evidence showing that a particular strategy benefits learning assessed by different types of tests. Factual refers to tests assessing whether the learner can recall the studied information while Application refers to tests assessing whether the learner can apply the studied information to a new context (e.g., problem solving).

This handout is a summary and adaptation of Miyatsu, T., Nguyen, K., & McDaniel, M. A. (2018). Five popular study strategies: Their pitfalls and optimal implementations. *Perspectives on Psychological Science*, 13, 390–407. http://dx.doi.org/10.1177/1745691617710510