The APA Introductory Psychology Initiative Pilot
Fall 2019

Lesson Plan: Improving Study Skills through Psychological Science

Instructions for Instructors

This lesson plan outlines an introduction to effective study skills that can be integrated into your Introductory Psychology course. It can be covered in one class period or longer. It also includes a selection of optional activities for each section of the lesson, formative and summative assessments of learning, and supplementary resources. A set of presentation slides to accompany this lesson plan can be found at http://bit.ly/StudySkills_IPI.

Learning Goals for this Module

- Identify the components of effective studying (attention, multitasking, working memory, learning strategies, metacognition)
- Design a study plan using effective study strategies

Presentation Outline

(This is an outline of major points in the lesson. Additional information about effective study skills and supporting research are located in the Resources and References section.)

- Studying in ways that effectively promote learning is a critical academic skill, but it is also a critical career and life skill. People need to learn new things throughout their life.
    - Instructors can conduct the Study Strategy Poll here (**Activity 1**).
    - Research shows that some of the most popular study strategies that students use are also the least effective for learning. For example, rereading and highlighting are not effective learning techniques by themselves.
    - If a student uses poor study strategies, the student can study long and hard but still fail.
- The content of introductory psychology includes concepts that are necessary for effective studying.
    - Attention: People, and that includes students, cannot multitask. Students often believe that they are expert multitaskers because they do it a lot. Trying to multitask causes people to constantly switch the focus of their attention. Research shows people miss a lot of information outside of their focus of attention, and they are not aware of what they have missed (i.e., inattentional blindness). Students must eliminate distractions and study with full focus. Instructors can conduct the Inattentional Blindness activity here (**Activity 2**) and the Cost of Multitasking activity here (**Activity 3**).
    - Short-term or working memory: Short-term memory, also known as working memory, is what students use when actively thinking about study materials. This memory is limited in capacity. Effective studying involves transferring information through this limited-capacity memory to long-term memory, which has an enormous capacity. Using short-term memory for this transfer can take time and effort.

- There are six key learning strategies in this lesson. Instructors should introduce the strategies to students. For example, instructors may have students view the *How to Study* videos by Stephen Chew (**Activity 4**), or they may assign Miyatsu, Nguyen, and McDaniel (2018) as a reading (**Activity 5**). These activities might occur before class or during class time. Instructors may also assign other readings or lecture to introduce the strategies. For more information about each strategy, plus downloadable teaching resources, instructors can go to www.learningscientists.org and www.retrievalpractice.org. They can also refer to the books listed under Resources and References.
    - Distributed or spaced practice: Learning takes time. Students should distribute studying across multiple sessions rather than massing it in one session. Cramming is ineffective for long-term retention of information.
    - Interleaving: Students should mix up the content that they are studying rather than studying just one type of content. For example, rather than studying for one course in one block of time, study for two different courses during that one block of time, going back and forth from one to the other.
    - Chunking: Group ideas together into meaningful chunks of information. Organizing facts into meaningful categories that go together. So, if someone has to remember to buy lettuce, cheese, cucumber, tomatoes, dressing, and croutons, this grocery list is easier to recall if he or she group all of these ingredients into one chunk called "salad."
    - Elaboration: Elaboration occurs when students make meaningful associations with what they are studying. Deep thinking might include connecting material to things that they already know, producing examples, and asking questions. The Depth of Processing activity can occur here to introduce elaboration **(Activity 6).**
    - Retrieval practice: To help learning, students should practice recalling and using information. Rather than just re-exposing oneself to information by repeatedly looking over material, students should test their ability to explain information or produce answers to questions without looking at notes or the textbook.
    - Overlearning: Students should keep studying well after it feels like they have mastered the material. Once students have correctly answered a question, they should not quit studying that topic. The more students correctly retrieve and apply information, the easier it becomes to do so.
- Metacognition: In the context of learning, metacognition has to do with student awareness of their own level of understanding of a concept.
    - Successful students have an accurate sense of metacognition. They know when they have mastered material. Struggling students have poor metacognition because they are overconfident. They think they have a good understanding when their understanding is shallow and has gaps and misconceptions. As a result, they start studying too late and stop studying too early. They think they do well on exams and are surprised to find out they have done poorly.

        - Introductory students struggle the most with metacognition. Those who know the least about a field are the least prepared to grasp what they do not know.
        - Bad study strategies increase confidence without increasing learning. For example, textbook material will feel familiar and easy after reading it several times, but that feeling does not mean that a student will be able to recall the material on a test. Don't confuse familiarity with learning.
        - The best way students can combat poor metacognition is to test their understanding and get feedback about accuracy. Practices tests and review questions work well for evaluating understanding. Students can also explain the material to someone else or write down what they know and check it against the textbook. In introductory courses, it is best for students to assume that they have poor metacognition and simply study more than they think necessary.
- To summarize, effective studying involves multiple components.
    - Study with full focus and minimize distractions.
    - Study using effective learning strategies.
    - Assess one's level of understanding to identify confusions, gaps, and misconceptions.
- Conclusion: Effective studying is more than the amount of time spent studying. It is the quality of study, which takes time and effort.
    - Instructors can use the Study Plan discussion activity (**Activity 7**) or the Distributing Study Time activity (**Activity 8**) here. Activity 7 can also be used as an assessment. Instructors can also discuss the Intense Study Session as an example of structuring an effective study session (**Activity 9**).

List of Activities and Assignments for Students

1. Activity 1: Study strategy poll (see Appendix A).
2. Activity 2: Inattentional blindness demonstration (see Appendix B)
3. Activity 3: Cost of multitasking demonstration (see Appendix C)
4. Activity 4: View *How to Get the Most Out of Studying* videos by Stephen Chew (see Resources)
5. Activity 5: Read study skills article by Miyatsu, Nguyen, and McDaniel (see Resources)
6. Activity 6: Depth of processing activity (see Resources listed as Chew, 2010)
7. Activity 7: Discussion of study plan essay (see Assessment 1)
    - The scoring rubric for the essay is in Appendix D
8. Activity 8: Discussion of distributing study time (See Appendix E)
9. Activity 9: Discussion of intense study sessions (see Appendix F)

Formative and Summative Assessments

- Concept Checks for Formative Assessment
  (These questions can be used to gauge student understanding at key points during the lesson. They may be used as a think-pair-share or a clicker question for peer instruction.)

1. Which of the following statements on how people learn is supported by research?

   a. People are worse at multitasking than focusing on one task at a time
   b. Effective learning is a matter of the amount of time spent studying
   c. Effective learning is a matter of how many times a student has read the material
   d. People learn best when the learning material matches their specific learning style

2. Which of the following is most likely to lead to long-term learning?

   a. Highlighting key terms and phrases
   b. Closing your book and notes and writing down everything you can remember about a topic
   c. Reading over the textbook multiple times
   d. Concentrating on only one course or topic during a block of study time

3. Which of the following is an example of poor metacognition?

   a. Joe failed an exam because he memorized definitions but his professor tested him over comprehension.
   b. Amy felt confident she did well on the exam but was stunned to find out she barely made a D grade.
   c. Cindy studied by reading her notes and her textbook over and over again, but still made a bad grade.
   d. Sam thought he could learn the material well enough if he just read the chapter summaries, but he ended up failing the exam.

   Answers: 1. A; 2. B (a form of retrieval practice); 3. B but also D (the students show poor awareness of what they learned and how to effectively learn).

- Formative or Summative Assessments

Assessment 1: Study Plan Essay

- Consider your academic schedule for the upcoming weeks. Design a study plan that will allow you to learn effectively. The plan should do the following things.
  - Describe specific ways that you account for limitations of attention and working memory.
  - Describe specific plans to apply at least two effective learning strategies.
  - Describe ways that you will use metacognition to become aware of your level of understanding.
  - Identify potential obstacles and describe methods for overcoming them.
- Instructors can find a scoring rubric in Appendix D.

Assessment 2: Multiple Choice Questions

1. Many first year students have poor metacognition. This could result in which of the following?

   a. They are likely to stop studying before they truly understand a concept.
   b. They believe they have a complete understanding of a concept when really their understanding is shallow, with both gaps and misconceptions.
   c. They will overestimate how well they do on exams.
   d. All of the above are consequences of poor metacognition.

2. Which of the following statements is TRUE about multitasking?

   a. People have a pretty accurate sense of how good they are at multitasking.
   b. You become better at multitasking the more you do it.
   c. Younger people who have been raised with technology are good at multitasking.
   d. Multitasking virtually always hurts performance compared to focusing on one task at a time.

3. Which of the following statements is true?

   a. Attention allows us to notice most anything going on in our environment.
   b. Students who are more motivated to learn will learn more.
   c. A major challenge of studying effectively is getting information through the limited capacity of working memory.
   d. Any study strategy will lead to learning.

4. In an evening study session, Joan first studies a section from her psychology course. Then she switches to study a section of art history. Then she studies more psychology. Finally, she goes back and studies more art history. Joan is using the study strategy of

   a. Spacing

b. Interleaving
c. Retrieval practice
d. Chunking

5. Instead of studying the properties of cornea, lens, rods, cones, and fovea separately, Astrid studies them all together as parts of the eye for vision. Astrid is using the learning strategy of

a. Spacing
b. Interleaving
c. Retrieval practice
d. Chunking

Answers: 1. D; 2. D; 3. C; 4.B; 5. D

Resources and References

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Chew, S. *How to Get the Most Out of Studying.* A series of five videos (with optional introduction) created by Stephen Chew on how to study based on cognitive principles. Retrieved from: https://www.samford.edu/departments/academic-success-center/how-to-study

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Appendix A

Class Poll on Study Strategies

- Description

  - Instructors can conduct an informal poll at the start of the module using clickers or votes by hand to illustrate how frequently students use various study strategies. Instructors can point out when the results suggest that students are using ineffective strategies.
  - A variation on this activity would be to ask students to vote whether each method is effective or ineffective.

- Sample script

  - I am going to list off a number of strategies for studying. Vote for the methods that you typically use when studying for your classes.

1. Reading the material over and over
2. Spreading out your studying over many days
3. Staying up late the night before to pull an all nighter
4. Using flashcards to test your knowledge
5. Cramming right before the test
6. Mixing up material from different classes rather than studying for just one class at a time
7. Rewriting your notes
8. Coming up with questions to test your understanding
9. Memorizing definitions of key terms
10. Applying the information to your own life
11. Making the material fit your personal learning style
12. Studying in a quiet place with no distractions

Appendix B

Inattentional Blindness

There are many good examples of inattentional blindness on YouTube. Here are two:

1. *The Monkey Business Illusion* by Dan Simons: https://youtu.be/IGQmdoK_ZfY
2. *Test Your Awareness: Whodunnit?* A Public Service Announcement commercial for bicycle awareness: https://youtu.be/ubNF9QNEQLA

Appendix C

The Cost of Multitasking

The following demonstration shows the cost of multitasking. The class carries out this task in pairs. A group of three is acceptable for odd numbers. One member of the pair will act as the timer as the other carries out the task. Then the two members switch roles. Each member should have his or her time for each task.

1. Partner up; you will need a stopwatch
2. Time each other doing the following:
   a. As quick as you can, count down from 10 to 0, then immediately say the alphabet out loud from A-K
   b. Now, alternate between the alphabet and counting down, 10-A, 9-B,…
3. Divide your second task time by your first task time

- Everyone should have their times and their ratio from Step 3.
- If their ratio is 1 or less, they are good at multitasking.
- If their ratio is greater than one, it indicates how much slower they were at multitasking. For example, a 3.0 means they were three times slower multitasking than focusing on one task at a time. Ask which task was easier to see if their experience matches their times.
- Have students consider how much more inefficient they are while multitasking than focusing on one topic and then another. Note that these are familiar, highly overlearned tasks. Multitasking is likely worse when doing complex, unfamiliar tasks like studying.
- Ask how the students plan to reduce the effects of multitasking and have them share with each other or the class.

Appendix D

Rubric for Assessment 1: Study Plan Essay Question

Performance domain	Effective (2)	Needs improvement (1)	Missing (0)
Attention	The plan makes specific mention of methods for eliminating distractions and the need to maintain focus based on limited attention and working memory capacity.	The plan mentions distractions and limited attention or working memory, but it is not specific.	The plan does not address distractions, attention, or working memory.
Learning strategies	The plan contains accurate and practical application of two or more learning strategies (e.g., distribution, interleaving, chunking, elaboration, overlearning).	The plan contains accurate and practical application of one learning strategy.	The plan includes no accurate or practical applications of learning strategies.
Metacognition	The plan includes a specific strategy for gaining accurate feedback on comprehension.	The plan mentions feedback on comprehension.	The plan includes no means of feedback on comprehension.
Practicality	The plan is practical and could be realistically implemented. The plan identifies obstacles and effective methods for overcoming them.	The plan could be implemented. The plan identifies obstacles and possible methods for overcoming them.	The plan could not be implemented. The plan identifies no obstacles.

Appendix E

Distributing Study Time

It's Monday. You have an exam on Friday over four chapters. What is your study plan?		
Plan A	**Plan B**	**Plan C**
Monday: Read Ch. 1	**Monday**: Do other stuff	**Monday**: Read Ch. 1 & 2 (at least)
Tuesday: Read Ch. 2	**Tuesday**: Do other stuff	**Tuesday**: Test self over Ch. 1 & 2; Read Ch. 3 & 4
Wednesday: Read Ch. 3	**Wednesday**: Start Reading	**Wednesday**: Test self over Ch. 3 & 4; Review Ch. 1 & 2 based on self-test
Thursday: Read Ch. 4 and review all chapters	**Thursday**: Finish Reading and Review	**Thursday**: Review Ch. 3 & 4 based on self-test; Review and self-test all chapters
Friday: Take Exam	**Friday**: Take Exam	**Friday**: Take Exam

Discussion Questions

1. What do you think are the strengths and weaknesses of each plan?

2. Which of the plans do you think would be most effective and least effective for learning? Explain your reasoning.

3. Which plan do you think you should follow? Which plan do you think you would likely follow (or what plan of your own would you follow)? Explain your choices.

Instructor Discussion Guide for “Distributing Study Time” Activity

Plan A represents a methodical approach to studying. Every chapter is read once. Students may see this as a good study plan because it is thorough, but reading a chapter only once is not sufficient for learning new, complex concepts. There is no mechanism for feedback about proper understanding (metacognition) or misconceptions. In addition, chapters read early in the week are likely to be forgotten by the exam. Students need to have an opportunity to read the chapter, reflect on it, get answers to any questions about it, get feedback about their understanding, and review the material. Although comprehensive, this is not a good study plan for long-term learning.

Plan B represents cramming, concentrating study time immediately before the exam. While cramming can be an effective study strategy for immediate recall, it is a poor study strategy for long-term recall because forgetting is rapid from massed studying. It is also a highly risky strategy. If it turns out that the material is more complex than the student anticipates, there is no additional time that the student can allocate for studying. If the student cannot grasp the material quickly or has questions, there is no opportunity to get help. If the student has misconceptions from the reading, there is no way to discover these before the exam. Students, especially struggling students and those who are aiming just to pass the exam, may easily fail the exam using this strategy.

Plan C requires the most effort to carry out but will lead to the most enduring learning and gives the student the best chance of developing a deep, accurate understanding of the material. By reading, self-testing, then reviewing, students have a chance to reflect on the material, discover gaps and misconceptions, formulate questions and get answers to those questions. This plan incorporates spacing, interleaving, and retrieval practice, all highly effective long-term learning strategies. This method requires more planning and self-discipline than the other plans.

Appendix F

Intense Study Sessions (ISS)

Originally from the Louisiana State Website and adapted for use here:
(https://www.depauw.edu/files/resources/cook2013.pdf)

1) Set a Goal (1-2 min)
   - Decide what you want to accomplish in your study session

2) Study with Focus (30-50 min)
   - Eliminate all distractions and temptations
   - Use deep processing

3) Reward Yourself (5-10 min)
   - Take a break– call a friend, play a short game, get a snack, but keep it short.

4) Review (5 min)
   - Go over what you just studied
   - Recall without looking