

Graded Exercise 1

CSC131 The Beauty & Joy of Computing

07 September 2018

1. Why should we pay attention to what Vince Dooley says about learning?

Vince Dooley had a long career coaching football at the University of Georgia. A coach is a teacher. He was a very successful teacher. During his tenure, the team won 201 games, lost 77 games, and tied in 10 games. He used many of the methods that we have encountered, including interleaving the study of different subjects, reflecting upon lessons learned, mixing the study of new and challenging themes with periodic returns to practice simpler skills, and dividing the time allotted to practices among several sessions.

2. People learn better through spaced practice than they do through massed practice. What is a possible explanation?

Spaced practice divides the study over several sessions. It includes some time away from study between sessions. It forces the student to recall in the second session what was learned in the first session. These exercises in recall move the knowledge into long-term memory. Spaced practice gives a student time to connect new knowledge with old knowledge. The student interprets new data and thinks about relationships among ideas. Massed practice, by contrast, exercises short-term memory.

3. Bonnie Blodgett knows the scientific names of many plants. How did she learn these names? What did she gain by learning these Latin words?

Bonnie had studied Latin and French, a language with Latin roots, in school, so she had a little foundation on which to build. She did not set out to learn the scientific names of plants, but she saw the names, could recognize the meanings of some names, and soon found that a knowledge of the scientific names helped her understand more fully the special characteristics of different kinds of plants and the ways in which one kind was related to another. It helped her recognize plants that have more than one common name.

Bonnie learned more about the appearance, habits, and needs of various species at the same time that she learned about the scientific names of the species. Knowledge of what made each kind of plant special made it easier to remember a name, which often described those qualities. Understanding of the meaning of the Latin name might tell her something about the conditions in which a plant thrives.

The two kinds of learning complemented one another. Learning the one kind of thing made learning the other kind of thing easier. Learning Latin was for her not a chore, but fun.

4. You may have heard that “the rich get richer.” The authors of *Make It Stick* argue that those who know a lot already may find it easier than others to learn more. Why might that be true?

New knowledge “sticks” better when we can connect it to old knowledge. If we can identify a context in which we will use a new idea and if we can relate a new fact to facts that we already possess, then we can more easily connect the new fact and the new idea.

5. Define Graham Wallas’ four stages of control: preparation, incubation, illumination, and verification.

Preparation is our initial struggle with a problem. In this phase, we try many different approaches but might encounter roadblocks in each case. We work with great intensity during this phase.

Incubation is our time away from a problem. In this phase, we give our brains a rest. We are not thinking consciously about our problem, but, as we dine, talk with friends, or take a walk our brains are quietly sorting things out.

Illumination is the moment of inspiration. The answer might appear in a dream. An idea might appear all of a sudden. The pieces come together. This is the moment when we shout “Eureka!”

Verification is the work needed to work out all of the details, test our solution, and confirm that our flash of insight really did give us the answer that we were seeking.

6. Ut Na Sio and Thomas C. Ormerod studied the effects of different kinds of incubation breaks. What did they find?

They examined the effects of taking time to relax (for example, by listening to music), taking time to engage in activity that required little effort (for example, reading articles), and taking time to work on other tasks (for example, solving other problems, perhaps for a different class).

They also compared the effects of short and long breaks.

They found that long breaks are better. They found that the kind of activity pursued during the break matter little for those trying to solve mathematical problems, but people who are trying to solve linguistic problems do best by choosing activities that require a little effort.

7. What did Kurt Lewin and Bluma Zeigarnik see in a café in Berlin? How did they explain the phenomenon?

They found that waiters could remember the details of their customers' orders throughout the duration of a customer's meal, but promptly forget the order after the customer paid the bill.

People keep knowledge of tasks begun but not yet completed high in their minds. They put knowledge of tasks that they have finished to the backs of their minds.

We can use this effect to our benefit by starting projects early. The project will remain high in our minds even when we are working on other tasks. When we are working on other tasks, our minds will still be unconsciously turning over ideas related to the project. When we return our conscious attention to the project, we will discover that our unconscious minds have laid a foundation on which we can build.

8. Ronda Leathers Dively asked her students to write about their writing. Put yourself in the shoes of one of her students. Write in the first person. (Put the word “I” at the beginning of your sentences.) You are following Professor Dively’s directions. Explain what you are doing and why.

I want to write an essay.

- I am going to begin by talking to someone who knows a lot about my subject. I will write an account of this conversation.
 - I will select a word or phrase that has special significance in the field that I am studying. I will write about the meaning of this phrase and how different people use the phrase.
 - I will write about one perspective on my subject. I might choose a minority view, a highly disputed argument, or an understanding that held sway in the past but is no longer accepted.
 - I will respond to what I am reading in a journal, taking note of the errors in fact and logic that authors make, the ambiguities and contradictions in their articles, and the degree to which they succeed in informing and persuading.
 - I will write my essay.
9. Babbel, a company based in Berlin, produces software to help people learn languages. Look [here](#) at their description of their methods. Pay special attention to the section that is titled “Retain for the long term.” Search for some of the words or phrases that we have been using in our discussion of effective methods of study. Do you see any connection to what we have been reading in *Make It Stick* or *How We Learn*?

The people at Babbel are applying the same results of research in cognitive psychology that we are studying. Their product gives students spaced repetition. They have designed lessons to help students connect new knowledge to things that they already know. Students who use Babbel’s product learn in several different ways, through their eyes and ears, by speaking, listening, reading, and writing.

10. Take a look at the [Agile Manifesto](#). Follow the link on the page to get to the “Twelve Principles of Agile Software.” (Read it in any one of many languages.)

Which principle would you like to adopt as you develop your own way of working at our college? How will you apply it?

I expect many very different responses to this question. I am looking for personal responses. I am hoping that you will find a way to make a connection between one of the Twelve Principle and what you know about yourself—your goals, your habits, your talents.

For me, the statements about the importance of face-to-face conversations, avoiding the work that does not need to be done, and welcoming change are especially relevant.

The last statement asks us to reflect periodically on our own ways of working. It asks us to use those reflections to improve our own ways to working. This is a priority (and a challenge!) for me.