Guide to the Reading:
Make It Stick: Chapters 3–8

CSC131 The Beauty & Joy of Computing

04 September 2018

Questions on readings in *Make It Stick*

1. How has Principal Roger Chamberlain responded to charges that his approach substitutes rote learning for learning that enables students to evaluate claims, generate their own arguments, and apply knowledge in unfamiliar contexts?

The form of teaching and learning that he has promoted in his school gives students the foundation that they need to evaluate claims, generate their own arguments, and apply knowledge in unfamiliar contexts. As he sees it, we do not have a choice between learning facts or learning how to connect facts. Instead, the one kind of learning must precede the other kind.

2. Why did Mia Blundetto learn how to parachute jump?

Mia Blundetto learned how to parachute jump in order to qualify herself for a leadership position in the United States Marine Corps. She now directs the work of Marines who drop supplies by parachute.

3. Which use of a bowline did the authors suggest? Is this the best knot for the suggested use. Search on the Web for an answer.

The authors suggest using a bowline knot to tie a line to an anchor. Experts suggest using an anchor bend, not a bowline, for this purpose.

4. The authors want to persuade us that forgetting can be a good thing. To make this point, they give us examples of...

   - someone learning a foreign language
   - someone learning to drive
   - someone learning how to use a computer

   What has to be forgotten in each case?

Someone who already knows French might have to put that knowledge out of mind while studying Italian.

An American who travels to England will want to push to the background well-established driving habits when getting used to driving on the left side of the road.

A person who is familiar with Microsoft's Windows operating system can learn to use Apple's OS X operating system more quickly by shelving knowledge of terminology and commands that are specific to Windows.

5. The baseball players at California Polytechnic State University enjoyed what advantage (that is, what did they gain?) when thrown 15 consecutive curve balls? What was the drawback to this kind of practice?

The players learned how to hit curve balls more quickly when the pitcher gave them one curve ball after another. However, they did not gain a durable skill. Their stored the knowledge that they gained in short-term

memory. They needed, but did not get from this massed practice, the ability to hit a curve ball that appeared unpredictably, between other kinds of pitches.

6. What is a mental model?

A mental model is a set of skills or a collection of facts that a person uses together to accomplish a task or solve a problem. With practice and over time, a person learns to use a mental model effortlessly in many different circumstances. A person then no longer has to consciously recall each individual component of the model or deliberately execute each step of a procedure in sequence. A person in possession of the right mental model can respond quickly and accurately. A mental model integrates the several or many steps required for performance.

7. What is transfer of learning?

"Transfer of learning" enables students to use what they have learned in varied times, places, and conditions.

8. Experiments have shown that blurring the letters on a page, replacing some letters with blank spaces, and presenting ideas in a lecture in a different order than those ideas appear in the textbook all have what effect?

Blurring images, hidding letters, ordering topics differently in the lecture than in the assigned reading all introduce "desirable difficulties." They force students to work harder to make sense of the material. Students learn and remember more when they have to work harder.

9. List several questions that you might ask yourself during a reflection upon a lecture, reading, exercise in the laboratory, field trip, or other learning experience.

- What are most important terms? numbers? facts?
- What are the most important concepts?
- What were the most important examples of the key ideas?
- What did I try that was easiest for me? most difficult?
- Where can I go to learn more?

10. What does Bonnie Blodgett mean when she refers to herself as "The Blundering Gardner?"

Looking too hard at the challenges that lie before us might rob us of the courage to try. Bonnie Blodgett became an expert by experimenting. Curiosity, enthusiasm, commitment, and persistence made Bonnie Blodgett successful. She did not fear mistakes. She learned what she needed to know when she needed to know it.

11. Define "desirable difficulty."

"Desirable difficulties" slow our progress but make our learning more permanent. They force us to recall what we have already learned, connect ideas, make comparisons, and construct our own frameworks.

12. Create a story that will help us understand the meanings of some of these phrases. Invent one or more characters. Write 128–256 words. Use your imagination. Incorporate four or more of these phrases into your story.

- "hunger for narrative"
- "memory can be distorted"
- "imagination inflation"
- "suggestion"
- "interference"
- "curse of knowledge"
- "hindsight bias" (also called "knew it all along effect")
- "the feeling of knowing"
- "fluency illusions"
- "social influence"
- "false consensus effect"

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hunger for narrative People want to see a reason for events. They crave certainty. People construct stories to make sense of the world.

memory can be distorted People invent and insert details into a story to make sense of a memory.

imagination inflation Someone's suggestions can become a part of another person's memories. An invitation to visualize an imagined scene can produce memories that a person will confuse for real events.

suggestion A question can prompt an answer that then becomes a memory.

interference Memories of one set of events can contaminate memories of another set of events. People mix recollections of different episodes.

curse of knowledge People often forget how much difficulty they encountered in their efforts to learn something, and so fail to sympathize with beginners.

hindsight bias ("knew it all along effect") People often overlook the role of good fortune in their own success.

the feeling of knowing People often are quick to believe claims that are familiar, so repeated false or poorly substantiated claims can gain support.

fluency illusions People often confuse their familiarity with an article with an understanding of the article's content.

social influence People often adjust their own memories to make them conform to the accounts that other people provide.

false consensus effect People often assume that other people see the world in the same way that they do.

13. What did scientists at the Massachusetts Institute of Technology discover about how dyslexic patients process information in their visual field of focus and in their peripheral vision, respectively?

People with dyslexia appear to interpret information in the visual field of focus less well than other people, but appear to interpret information in their peripheral vision better.

14. Neil Fleming has described different ways that a person might like to learn. An acronym helps us remember that these preferences. What does VARK mean?

The letters in VARK are the first letters in the words Visual, Auditory, Reading, and Kinesthetic.

15. Kenneth Dunn and Rita Dunn created a catalogue of six components of a person's learning style. What are those six aspects?

- environmental
- emotional
- sociological
- perceptual
- physiological
- psychological

16. One way of identifying learning styles constrasts opposites.

styles of perceiving:	concrete
modes of processing:	active experimentation
styles of organizing:	random

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styles of perceiving:	concrete	abstract
modes of processing:	active experimentation	reflective observation
styles of organizing:	random	sequential