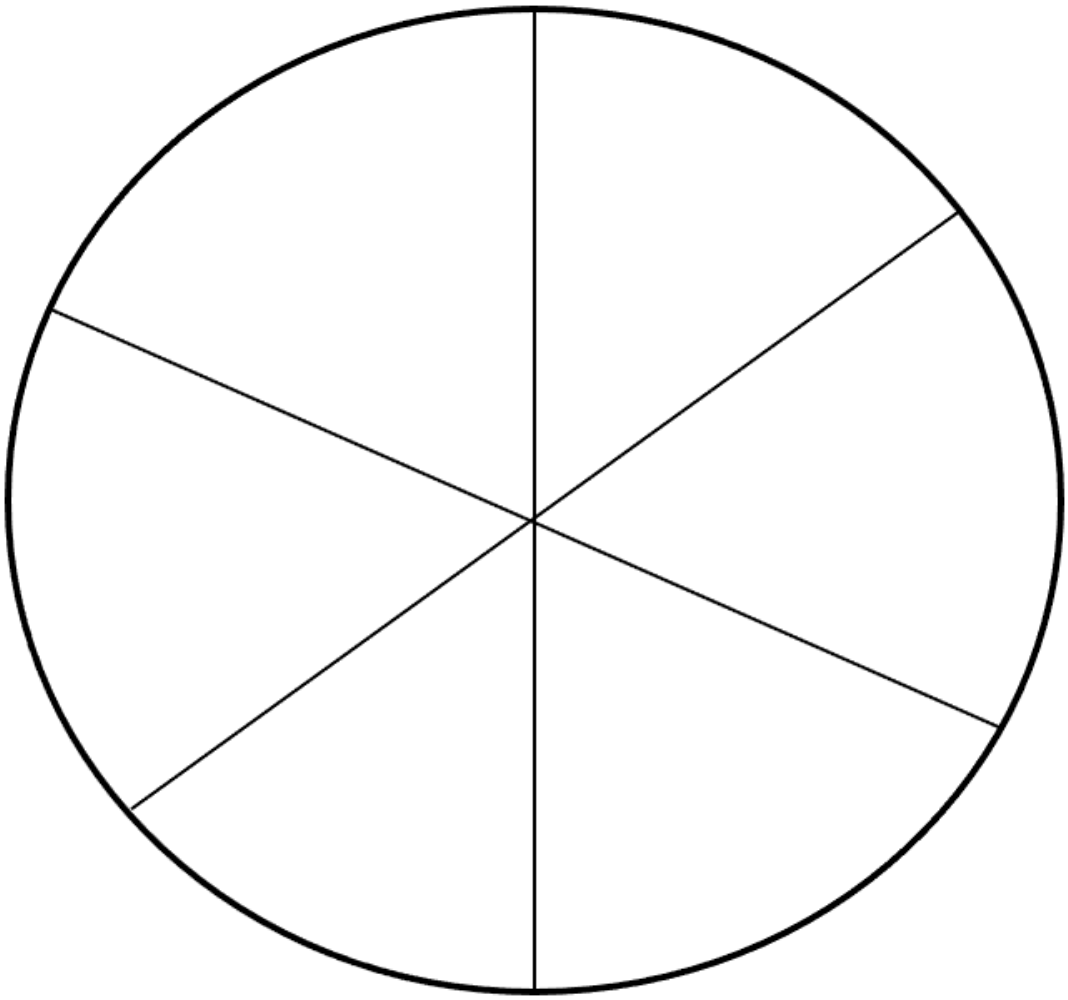
SPHEIR Pedagogical Training 2.0

More About Learning

Presented by

Walt Hurley
wlhurley@illinois.edu
University of Illinois at Urbana-Champaign

A Taxonomy of Significant Learning



Activity: [after the video]

1. Choose one lesson that you teach, one that you are comfortable presenting. You should already have the Foundational Knowledge and Application components of the Significant Learning Taxonomy.
2. Now choose two of the other components of the Significant Learning Taxonomy.
   Integration Caring Human Dimension Learning How to Learn
3. Write down how you might integrate or strengthen each of those two components into your lesson.

A Taxonomy of Significant Learning

From: L. Dee Fink, 2003. Creating Significant Learning Experiences. An Integrated Approach to Designing College Courses. Jossey-Bass, San Francisco, CA, USA.

Foundational Knowledge: Remembering and understanding information and ideas.
This level focuses on the ability to understand and remember specific information and ideas. The objective of this level is to have the learner understand and remember important concepts, facts, terminology, and/or principles. Foundational Knowledge provides the basic foundation and understanding that is necessary for other kinds of learning.

Application: This level is about determining if the learner can apply what they have learned. The level is also about developing skills or learning how to manage complex assignments or tasks. Students learn how to apply new skills by engaging in an action which may be intellectual, physical, or social. This level also focuses on learning how to engage in various kinds of thinking including practical, critical, and creative.

Practical Thinking – Solving problems and making decisions
Critical Thinking – Analyzing and critiquing issues and situations
Creative Thinking – Generating new ideas, products, and perspectives

Integration: At this level the learner is able to see and understand the connections between different things and apply principles that they have learned. This level is about understanding the connections or interactions between two or more ideas, perspectives, learning experiences, or realms of life.

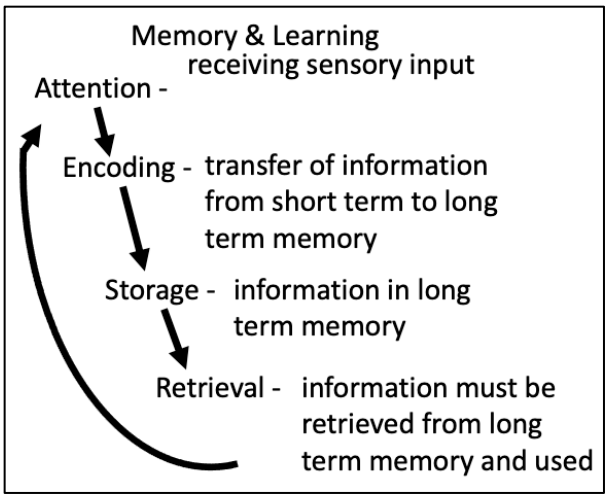
Human Dimension: This level is about establishing effective working relationships with others through the Personal Dimension (Self), and the Social Dimension (Others). Personal Dimension: Creating and taking responsibility for one's own life, and learning about and changing one's self. A person uses reflection and feedback from others to identify their strengths and areas for improvement. Social Dimension: Interacting with others.

Caring: The focus at this level is to get learners to care about something new or care about something in a new way, and to develop new feelings, interests, and values about learning. It is about becoming excited about a particular activity or subject, and wanting to be able to master material and achieve high standards.

Learning How to Learn: This level is about preparing students to continue learning about a particular topic after the module or session is over. How to become a better learner by engaging in self-regulated learning or deep learning, learning how to inquire and construct knowledge by engaging in a particular topic, and learning how to become self-directed learners by being a reflective practitioner and developing a learning plan.

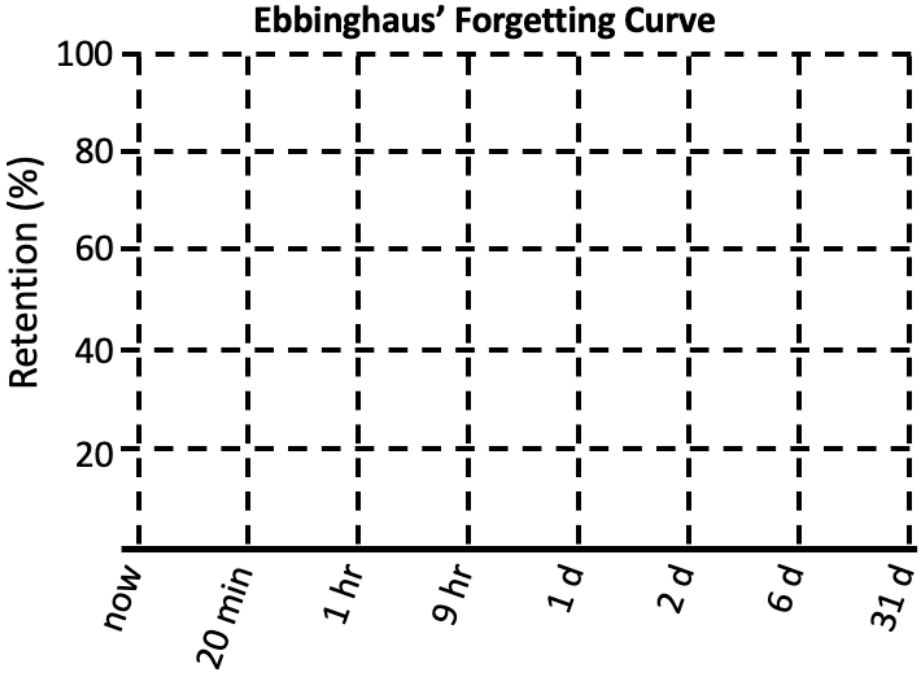
Memory & Learning - Memory

Types of Memory
Sensory memory: allows us to retain impressions of sensory information after the original stimulus has ceased.
Short term memory: the temporary memory that is stored in mind within few seconds to ~30 seconds.
Working memory: the system which holds transitory information (short term memory) AND the processes which allow this information to be manipulated; including reasoning and comprehension.
Long term memory: where informative knowledge is stored indefinitely.



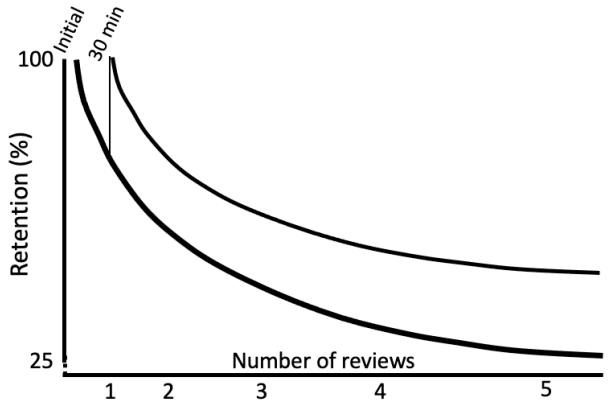
Memory & Learning - Forgetting

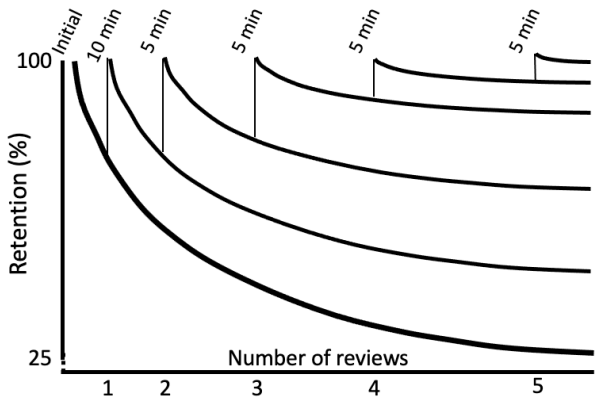
Ebbinghaus' Forgetting Curve: Developed by the German psychologist Hermann Ebbinghaus, the forgetting curve describes how the ability of the brain to retain information decreases in time. Ebbinghaus pioneered the experimental study of memory which includes the forgetting curve and the spacing effect.



Memory & Learning – Forgetting Curve & Teaching

The Spacing Effect: **learning is greater** when studying is spread out over time, as opposed to studying the same amount of content in a single session.





Activity: [after the video]

1. Choose a lesson from one of the modules that you teach; a lesson that you feel is a critical one for that module.
2. Consider the most important component of that lesson. The most important thing the students should know/remember.
3. Design a series of 3 or 4 brief (5-10 minute) review activities that you could offer at intervals after the initial lesson.
4. How would you spread those review activities out over the time from the initial lesson to the next learning evaluation?

Notes:

Learning Styles

Every individual has a unique way of perceiving, processing and interacting with information. Research has found that matching teaching methods to learning styles has **no** influence on educational outcomes. Nevertheless, the concept of learning styles remains extremely popular. It is helpful to understand a little about learning styles to help us better understand our students. There are many ways in which researchers have tried to categorize learning styles. Here are two:

VARK - Visual Auditory Reading/Writing Kinesthetic

Example: In which way would you learn a new skill the best?
1. Look at pictures of people performing the skill. (Visual)
2. Listen to an expert explain how to do the task. (Auditory)
3. Read in a book about how to perform the task. (Reading/Writing)
4. Watch someone else perform the skill and then try it yourself. (Kinesthetic)

VARK : is a questionnaire that provides users with a profile of their preferences. These preferences are about the ways that they want to take-in and give-out information whilst learning."
http://www.vark-learn.com/english/index.asp

Felder & Silverman's Index of Learning Styles

Sensing/Intuitive. A sensor likes problem-solving, experimenting, and using the senses to gather data. The intuitor is a fan of grappling with new concepts, innovating, and working with symbols.

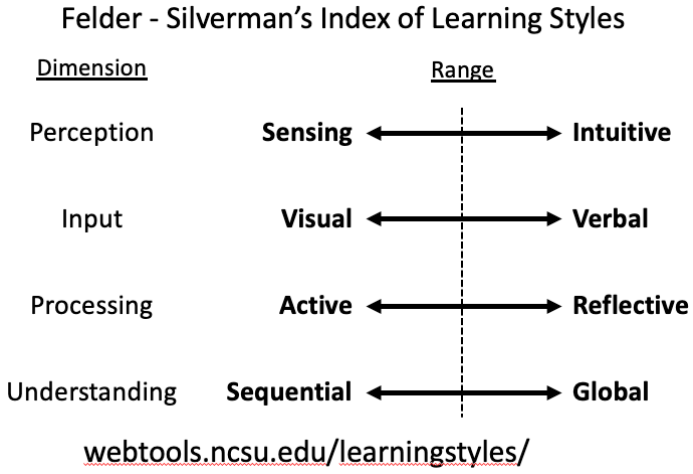
Visual/Verbal. A visual learner does well with pictures, diagrams, and other information perceived visually. A verbal learner is good with discussions and explanations, thriving when a mix of hearing and speaking get involved.

Active/Reflective. Learners who do well with active experimentation like to test out their new knowledge in the real world. The reflective observers prefer to examine and manipulate the information introspectively.

Sequential/Global. Sequential learners prefer material to be presented logically and in an ordered progression and think based on linear reasoning processes. The global learner learns piecemeal until the moment when the entire puzzle finally comes together.

On-line instruments to use with your students:
Index of Learning Styles developed by R. M. Felder and L. K. Silverman:
http://www4.ncsu.edu/unity/lockers/users/f/felder/public/Learning_Styles.html

R. Felder's webpage: Resources in Science and Engineering Education:
http://www4.ncsu.edu/unity/lockers/users/f/felder/public/
Learning Styles: http://www4.ncsu.edu/unity/lockers/users/f/felder/public/Learning_Styles.html



Activity: [after the video]

1. Choose one lesson that you teach; a lesson that you feel is a critical one for student learning.

2. Identify the most important point of that lesson, the thing students should know/remember.

3. Design separate 3-4 min long lessons about some aspect of that most important point, one lesson for each of the four VARK learning styles.

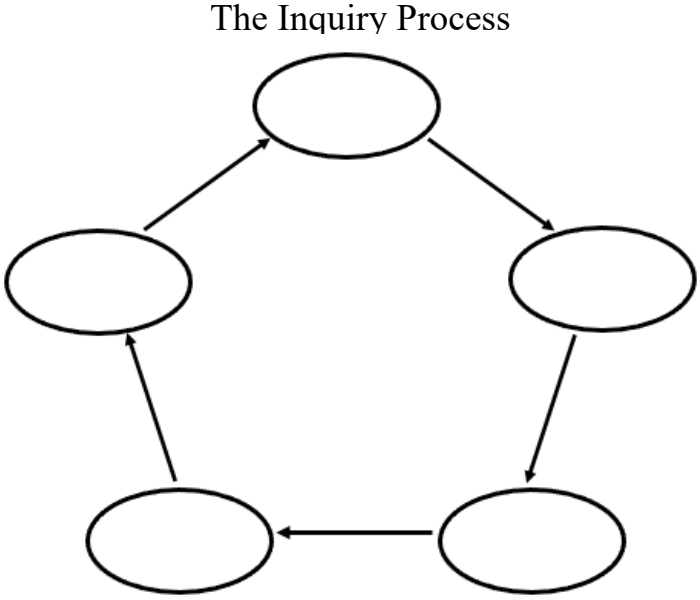
Visual Auditory Reading/Writing Kinesthetic

4. Combine those short lessons into one 10-15 min lesson that includes each of the elements of VARK.

The Inquiry Process

"It is not the answer that enlightens, but the question." *Eugéne Ionesco*

The products of inquiry may look different in different disciplines, such as the arts vs the sciences. However, the fundamental process is the same.



Adapted from: From the Inquiry Page, Chip Bruce & Ann Bishop, University of Illinois

Help your students more explicitly understand the inquiry process by explaining the steps:

ASK:
- People construct knowledge based on the questions that arise in their lived experience.

INVESTIGATE:
- What key words will you use to initiate your investigation?
- What strategy will you use to conduct your investigation?
- What resources will you use for your investigation?

CREATE:
- What conclusions have you drawn from your investigation?
- What product are you intending to produce or create in order to share what you have learned and your conclusions?

DISCUSS:
- How do you intend to share what you have learned and your conclusions?
- What outcome do you expect from sharing/discussing what you have learned and your conclusions with others?

REFLECT:
- What did you learn from sharing/discussing what you have learned and your conclusions?
- How does that discussion affect your understanding of what you have learned and your conclusions?

ASK:
- Based upon your reflection of your initial inquiry cycle, what further/additional question(s) have arisen which deserve another cycle of inquiry?

Then ask your students to write up their inquiry by explicitly addressing the steps, rather than using a classic term paper format. Ask them to address the following questions for each respective step:

ASK: What was the question? Why was it asked?

INVESTIGATE: What did you find? What was your strategy for investigating? What resources did you use?

CREATE: What did you create out of your findings? Why was that the creation that you chose?

DISCUSS: How did you share your work with others? What was the outcome of that sharing?

REFLECT: What did you learn? How do you think differently about the question now?

ASK: What is the next question that arises from your reflection and inquiry?

Activity: [after the video]

1. Consider some major assignment that you already give your students, such as a term paper, project, etc.

2. Now consider how you would modify that assignment or project in a way that helps students focus on the process if inquiry and that explicitly incorporates the steps of the inquiry process. Write out your plan for this inquiry based assignment.