

FEDERATION FOR SELF-FINANCING TERTIARY EDUCATION

Project On General Education Curriculum

In Collaboration With

Hong Kong-America Center



General Education Seminar

January 26, 2013

Dr. Robert Lagueux

Fulbright Scholar

City University of Hong Kong

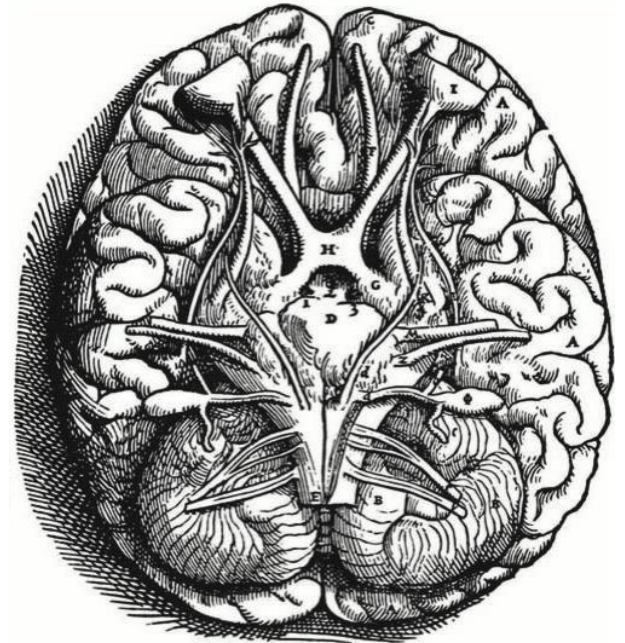
Dr. Dennis Berg

Fulbright Scholar

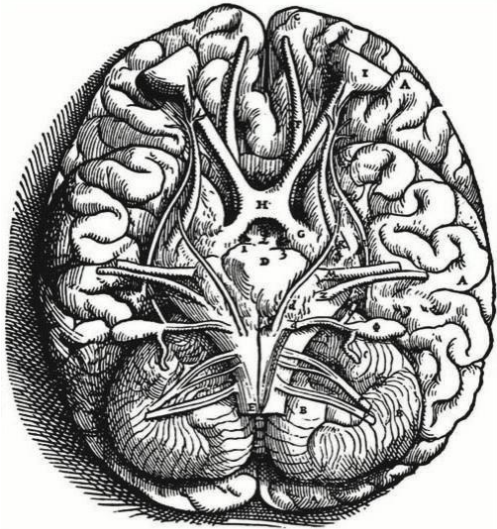
CUHK & Hong Kong-America Center

HOW STUDENTS LEARN

**THREE IMPORTANT THINGS
THAT COGNITIVE SCIENCE
& COMMON SENSE TELL US**



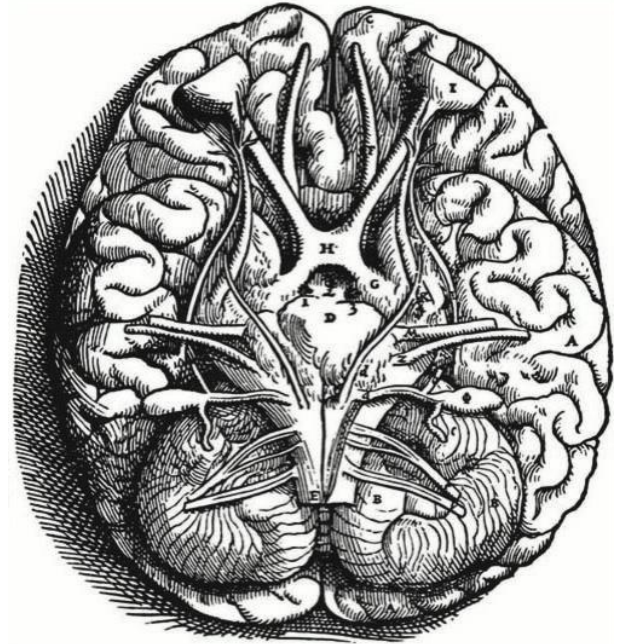
PRINCIPLE #1: MEMORY IS THE RESIDUE OF THOUGHT



- We understand new things in the context of things we already know.
- Understanding *new* ideas involves getting the right *old* ideas into working memory and then rearranging them (i.e., *prior knowledge*).

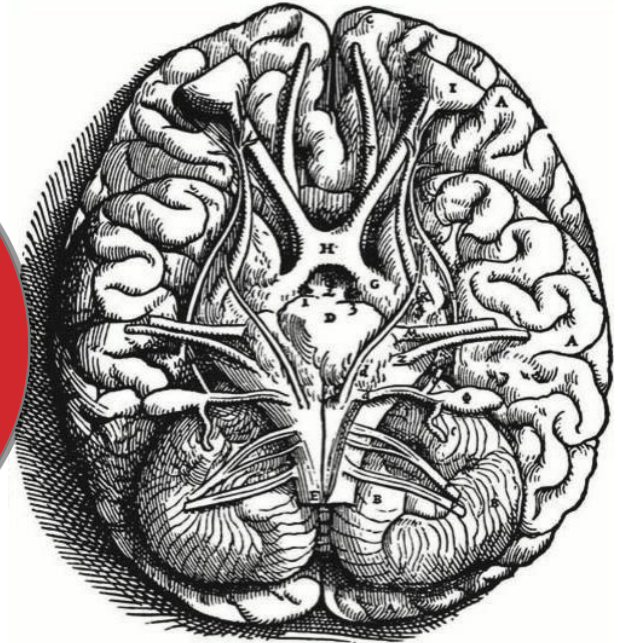
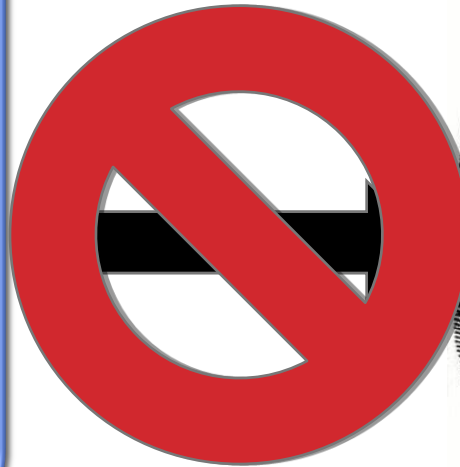
Outside the Brain

- Facts
- Skills
- Procedures
- Feelings
- Etc.



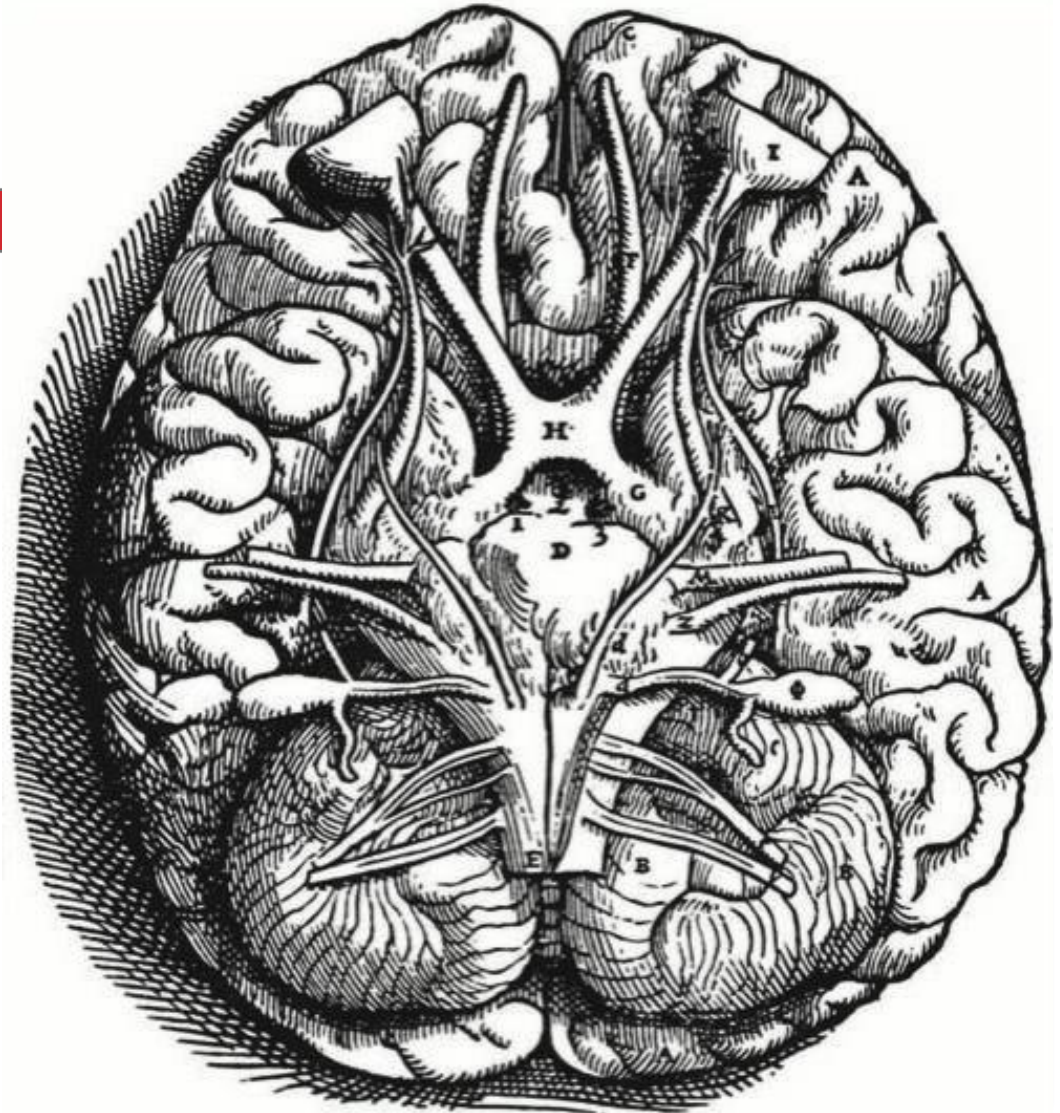
Outside the Brain

- Facts
- Skills
- Procedures
- Feelings
- Etc.

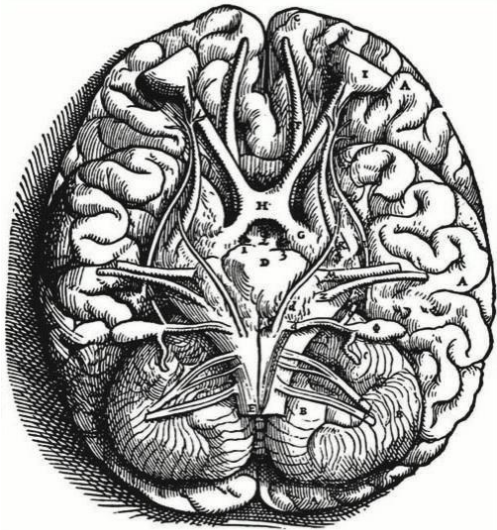


Outside the Brain

- Facts
- Skills
- Procedures
- Feelings
- Etc.

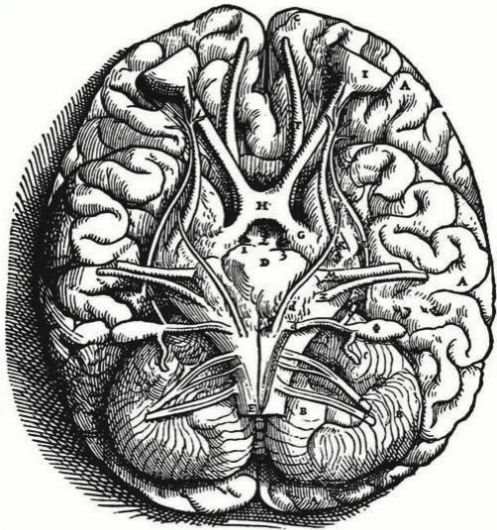


PRINCIPLE #2: PROFICIENCY REQUIRES EXTENDED PRACTICE



- **Have students practice the processes that need to be automatic.**
- **Give them immediate feedback on how to improve.**

PRINCIPLE #3: EXPERTS AND NOVICES THINK DIFFERENTLY



- Novices think about *surface features*.
- Experts think about *functions*, or deep structure.
- They “chunk” information differently.

CHUNKING

X
M
T
K
T
R

S
P
R
F
E
C

C
M
H
S
P
X

CHUNKING

X
M
T
K
T
R

S
P
R
F
E
C

C
M
H
S
P
X

X
S
M
H
F
P
X

C
T
K
S
R

M
R
T
C

P
E

CHUNKING

Ashburn hit a ground ball to Wirtz, the shortstop, who threw it to Dark, the second baseman. Dark stepped on the bag, forcing out Cremin, who was running from first, and threw to Anderson, the first baseman. Ashburn failed to beat the throw.

Daniel T. Willingham, *Why Don't Students Like School?* (Jossey-Bass, 2009)

IN SUM

Memory is the residue of thought. Assessing prior knowledge is crucial.

Proficiency requires extended practice and frequent feedback.

Experts and novices think differently.



Federation for Self-Financing Tertiary Education
Project on General Education Curriculum

In collaboration with

Hong Kong America Center

General Education Seminar



A “Teacher’s Dozen”

Dr Dennis Berg

A "TEACHER'S DOZEN"



Fourteen General, Research-Based
Principles for Improving Higher Learning in
Our Classrooms

by Thomas Anthony Angelo



Chickering and Gamson

A Summary Of 50 Years Of Research On The Way Teachers Teach And Students Learn


Chickering, A.W. & Gamson, Z.F. Seven Principles for good practice in undergraduate education. AAHE Bulletin, 39(7): 3-7.




1. Active learning is more effective than passive learning.

What I hear, I forget; what I see, I remember; what I do, I understand.

-Chinese proverb




Students learn more and better by becoming actively involved. Active learning occurs when students invest physical and mental energies in activities that help them make what they are learning meaningful. As George Stoddard put it, "We learn to do neither by thinking nor by doing; we learn to do by thinking about what we are doing."




2. Learning requires focused attention, and awareness of the importance of what is to be learned.

The true art of memory is the art of attention.

-Samuel Johnson




One of the most difficult tasks for learners is to figure out what to pay attention to and what to ignore. If you've ever found yourself lost and alone in a busy city in a country whose language, culture, and street signs are totally unintelligible, then you can imagine how many students feel when they encounter a "foreign" discipline for the first time in college.



3. Learning is more effective and efficient when learners have explicit, reasonable, positive goals, and when their goals fit well with the teacher's goals.


If you don't know where you are going, you will probably end up somewhere else.

-Laurence J. Peter and Raymond Hull



When learners know what their educational goals are and figure out how they can best achieve them, they usually become much more efficient and effective.


When learners know how and how well their goals fit the instructor's, they tend to learn more and get better grades.



4. To be remembered, new information must be meaningfully connected to prior knowledge, and it must first be remembered in order to be learned.

“Thinking means connecting things, and stops if they cannot be connected.”

-G. K. Chesterton




The more meaningful and appropriate connections students make between what they know and what they are learning, the more permanently they will anchor new information in long-term memory and the easier it will be for them to access that information when it's needed.




5. Unlearning what is already known is often more difficult than learning new information.

“It is what we think we know already that often prevents us from learning.”

-Claude Bernard




Habits, preconceptions, and misconceptions can be formidable barriers to new learning, all the more treacherous because, like icebergs, this prior learning is usually 90 percent hidden from view. Before we can help students unlearn or correct prior learning, we need to know something about what is below the surface.




6. Information organized in personally meaningful ways is more likely to be retained, learned, and used.

“Much goes on in the mind of the learner. Students interpret. They over-interpret. They actively struggle to impose meaning and structure upon new material being presented .”

-Donald A. Norman




Humans are extraordinary pattern seekers. We seek regularity and meaning constantly, and we create them when they are not apparent. To be most useful, the ways learners organize knowledge in a given domain needs to become ever more similar to the ways experts in that field organize knowledge. This requires making what is usually implicit, explicit.




7. Learners need feedback on their learning, early and often, to learn well; to become independent, they need to learn how to give themselves feedback.

“Supposing is good, but finding out is better.”

-Mark Twain




Regular feedback helps learners efficiently direct their attention and energies, helps them avoid major errors and dead ends, and keeps them from learning things they later will have to unlearn at great cost. It can serve as a motivating form of interaction between teacher and learner, and among learners.



8. The ways in which learners are assessed and evaluated powerfully affect the ways they study and learn.


“Let the tutor demand an account not only of the words of his lesson, but of their meaning and substance... Let [the learner] show what he has just learned from a hundred points of view, and adapt it to as many different subjects, to see if he has rightly taken in it and made it his own.”

-Michel de Montaigne



Whether faculty "teach to the test" or not, most students are going to try to "study to the test." Student want to know what will be on the test because it helps them figure out where to focus their attention.


In other words, they are looking for a roadmap. One way to improve learning, is to make sure our test questions require the kind of thinking and learning we wish to promote, and that students know - at least generally - what those questions will be.




9. Mastering a skill or body of knowledge takes great amounts of time and effort.

“There are some things that cannot be learned quickly, and time, which is all we have, must be paid heavily for their acquiring.”

-Ernest Hemingway



In a study of talented young adults who had achieved high levels of mastery in a variety of fields researchers found that none had achieved mastery in less than a dozen years, and the average time to mastery was sixteen years --at between 25 and 50 hours per week of practice and study. The time needed to achieve an acceptable mastery level is about 7,000 to 15,000 hours of preparation -- the equivalent of 40 hour weeks, fifty weeks a year, for three-and-a-half to seven years.



10. Learning to transfer, to apply previous knowledge and skills to new contexts, requires a great deal of practice.

Most learning is highly context-bound, and few students become skilled at applying what they've learned in one context to another similar a context. In fact, many students cannot recognize things they've already learned if the context is shifted at all.




11. High expectations encourage high achievement.

Younger students tend to achieve more by working with teachers who expect more of them. For the so-called "Pygmalion effect" to work well in college, however, the students must share the teacher's high expectations of themselves and perceive them as reasonable.




12. To be most effective, teachers need to balance levels of intellectual challenge and instructional support

The weaker or smaller the student's foundation (preparation) in the subject, the stronger and larger the instructional scaffolding (structure and support) that is required. This is one of the many reasons that teaching a first-year course requires a different approach than teaching a third-year course in the same discipline.



13. Motivation to learn is alterable; it can be positively or negatively affected by the task, the environment, the teacher, and the learner.

Students are likely to be more motivated to learn in your class if they see the value of what you're teaching; believe that learning it will help them achieve other important goals; believe that they are capable of learning it; and expect that they will succeed.



14. Interaction between teachers and learners is one of the most powerful factors in promoting learning; interaction among learners is another.

It isn't interaction in and of itself that promotes academic learning, it's structured interaction focused on achieving meaningful, shared learning tasks.