

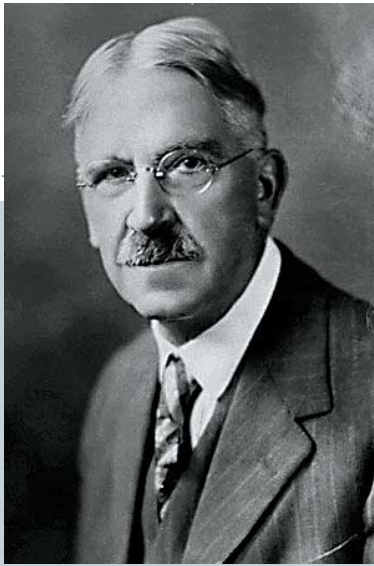
What Got us Here is Not What We Need Now: Using Research About Teaching to Suggest a Way Forward



2016 Teaching and Learning Symposium

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If we teach today's students as
we taught yesterday's, we rob
them of tomorrow. -- John Dewey

I don't skate to where the puck is, I
skate to where it will be.

--Wayne Gretzky

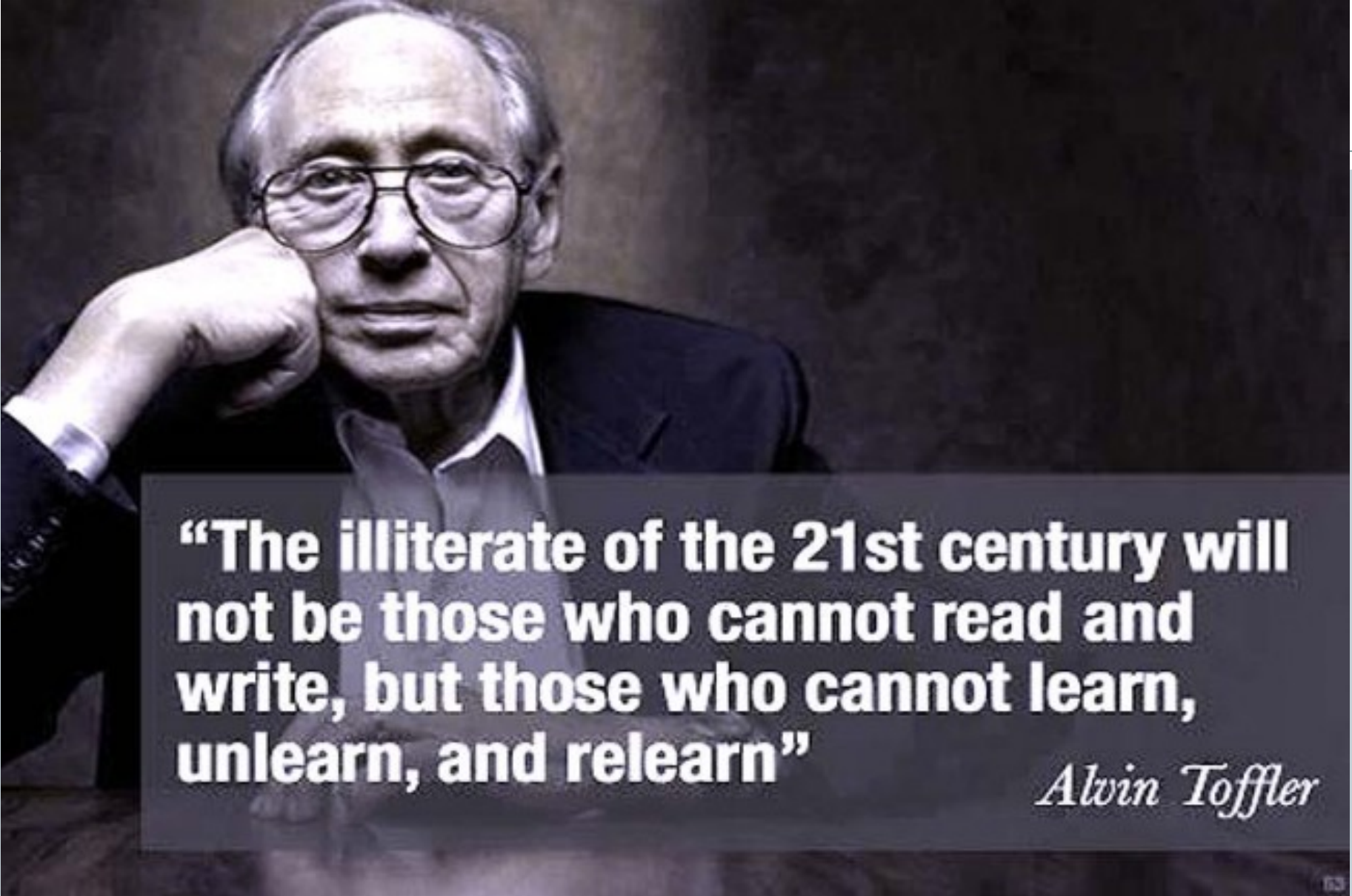


Concept of Knowledge/Being Smart



- **Having a great amount of information stored**
- **Being able to quickly retrieve needed information**

Our system is designed for this....Thinking vs. Memorizing....

A black and white portrait of Alvin Toffler, an older man with glasses, resting his chin on his hand. The background is dark and textured.

“The illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn”

Alvin Toffler

21st Century Skills



- **Critical thinking and making sound judgments**
- **Solving complex multidisciplinary problems**
- **Creativity and entrepreneurial thinking**
- **Communication and collaborating**
- **Making innovative use of knowledge and information**
- **Controlling financial, health and civic responsibility**

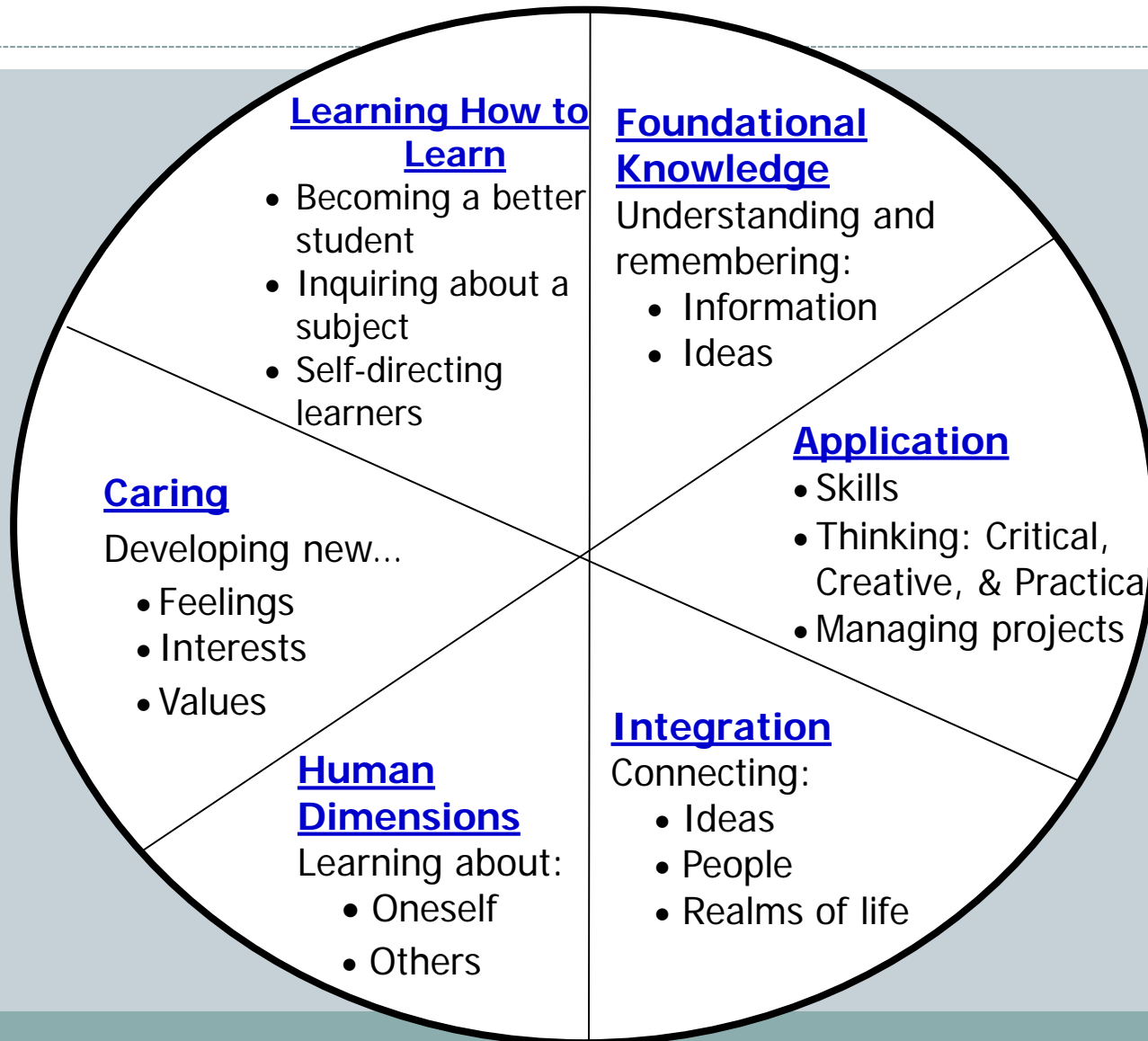
Thinking vs. Memorizing....



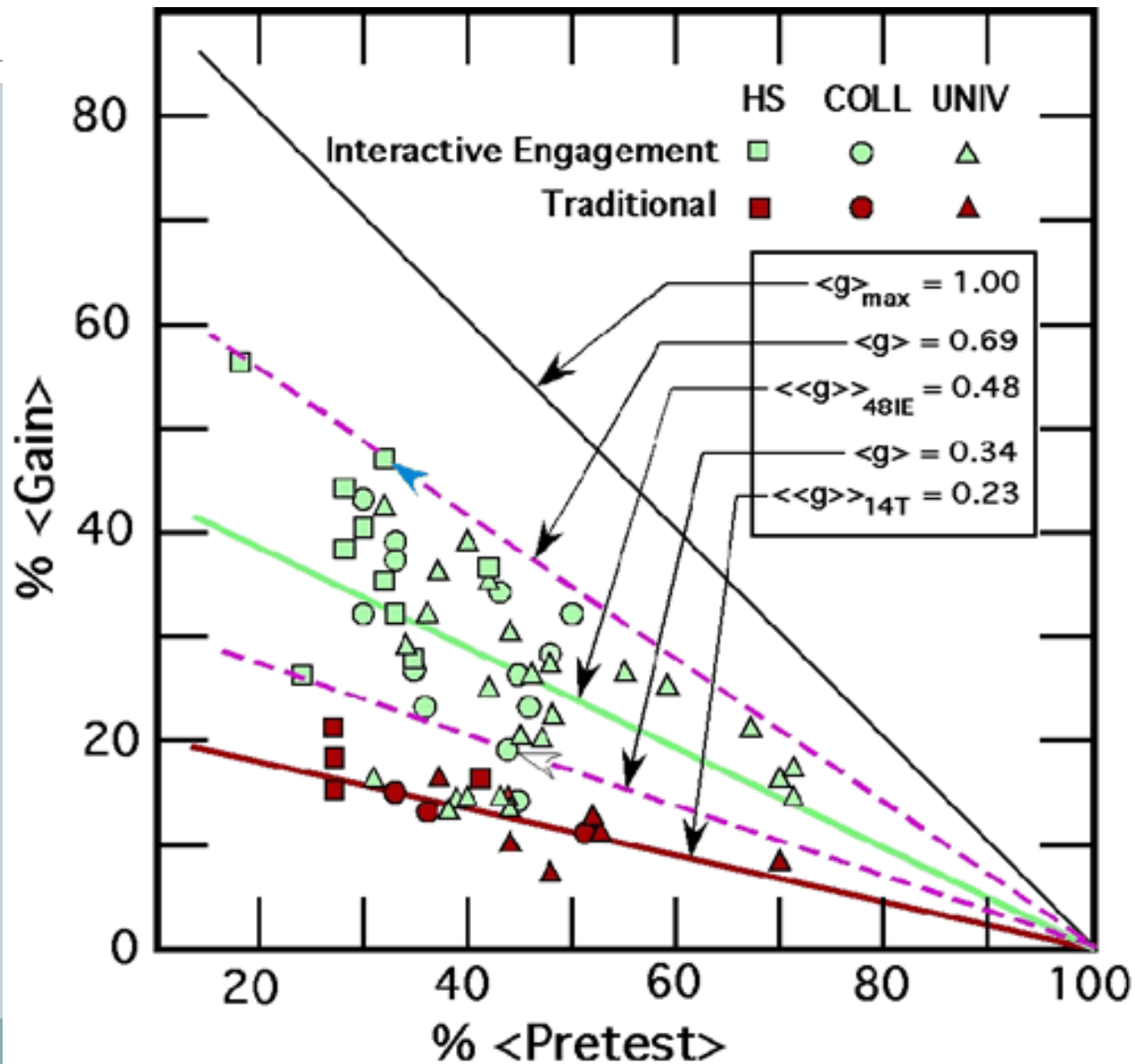
**1. Learning is best when it involves
the learner...**

Taxonomy of Significant Learning

Dee Fink, 2013



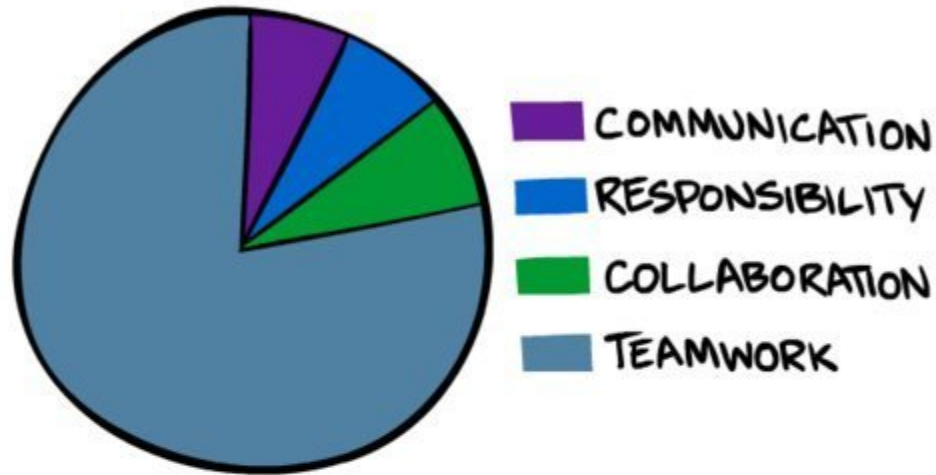
Hake (1998)



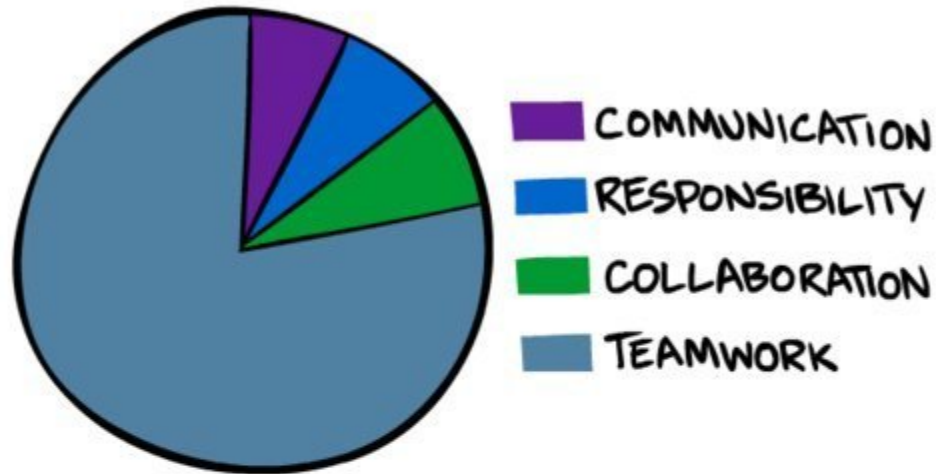
Teaching Strategies



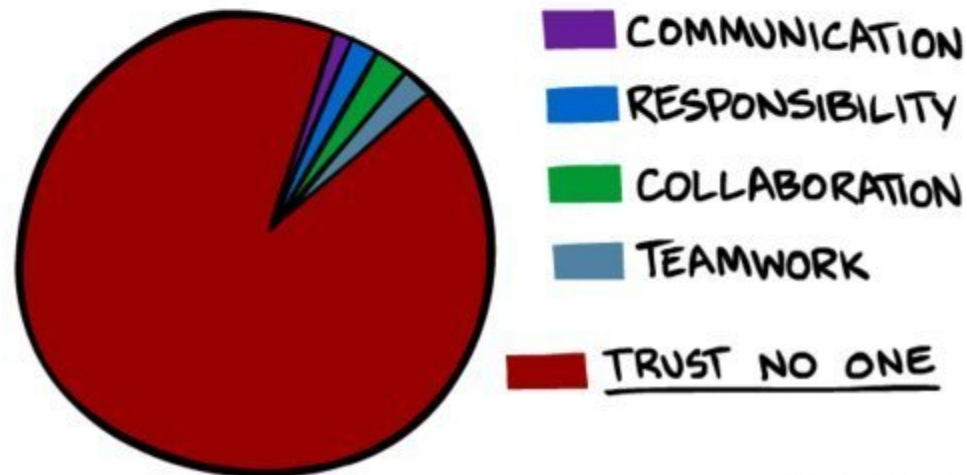
WHAT GROUP PROJECTS ARE SUPPOSED TO TEACH YOU



WHAT GROUP PROJECTS ARE SUPPOSED TO TEACH YOU



WHAT GROUP PROJECTS TAUGHT ME





2. Teach students about learning.

The New Science of Learning

Improving teaching without improving learning will not be enough to bring about the kinds of learning improvements that are needed to meet the job demands of the future.

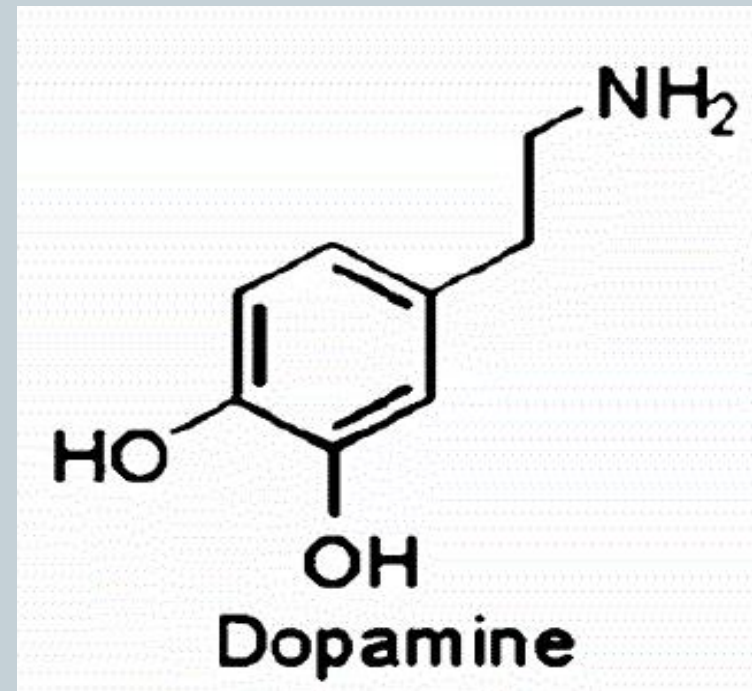




3. Humans like to learn.

Reward for Learning

- Dopamine is there to reward your brain for learning new information, or engaging in new experiences.
- Without dopamine, you would not be interested in learning or trying new things.



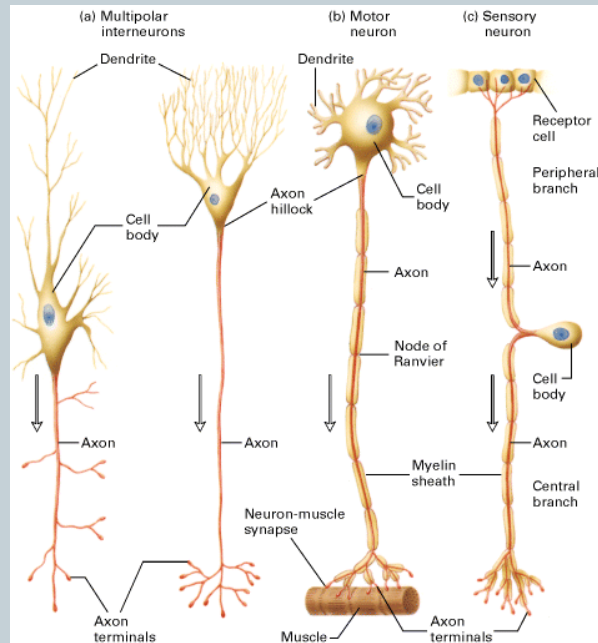


4. We do know a bit about how people learn.

Retrieval Dependent on Encoding



Strength of Memory Trace

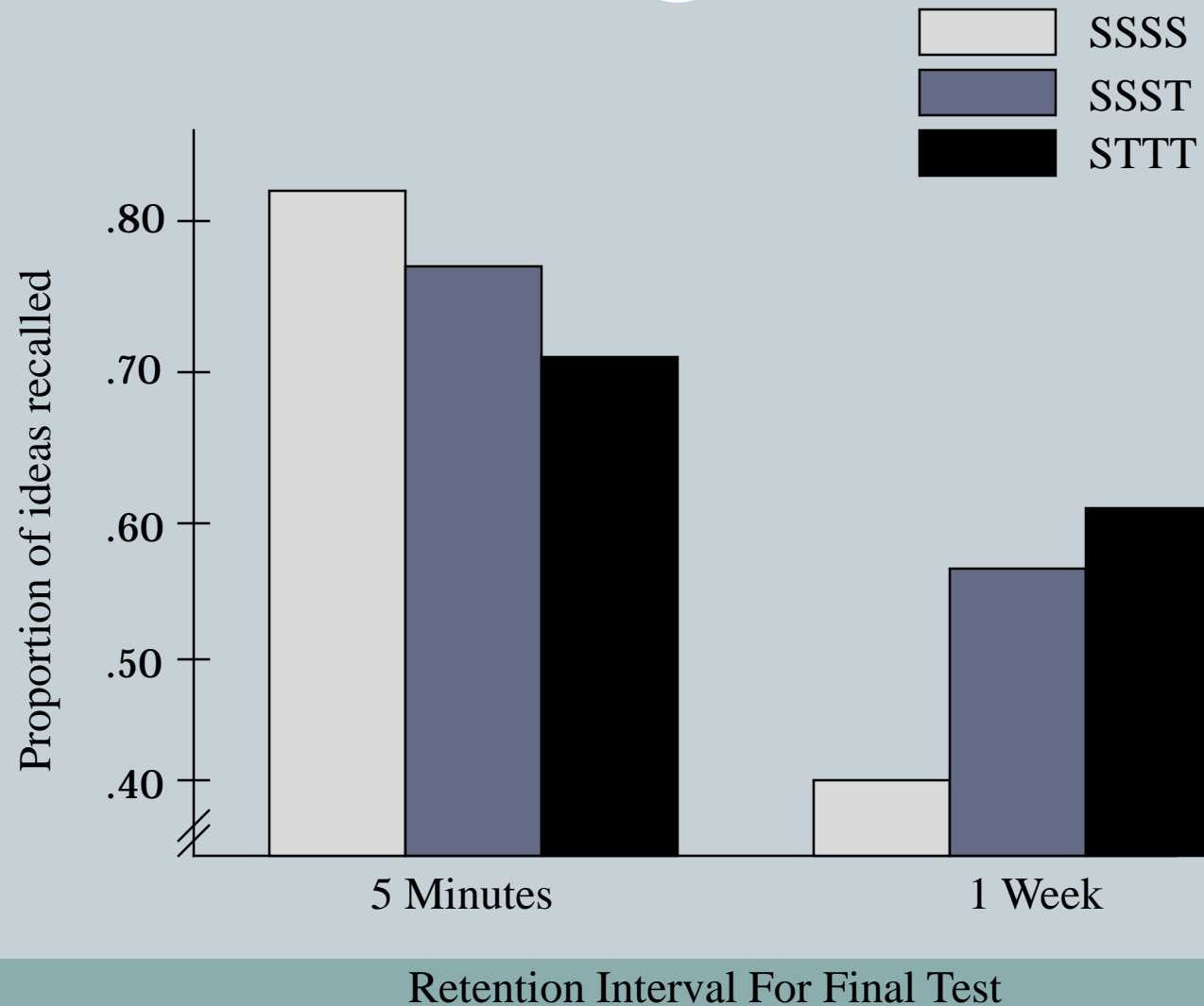


NOTE: Attention necessary to encode information.

Elaborations



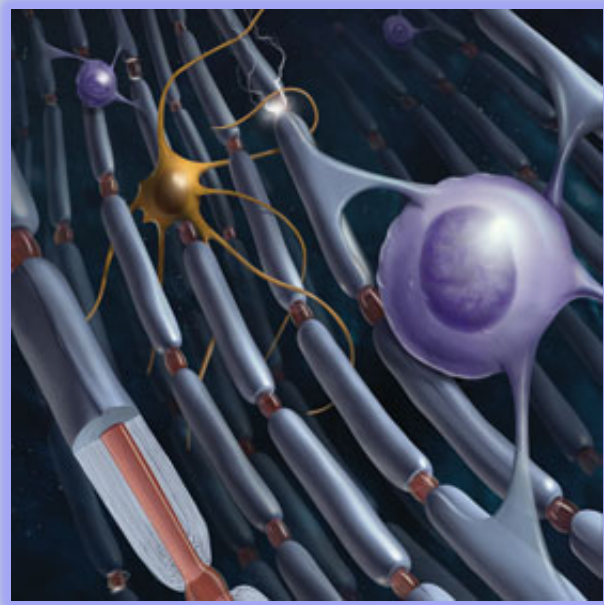
Karpicke & Roediger, 2007



We are what we repeatedly do. Excellence then, is not an act, but a habit --Aristotle



Long-term potentiation





5. Be cautious about things that sound good without research support.

Learning Pyramid

Luminosity

Learning Styles



Learning Styles: Concepts and Evidence

-- vision and olfactory very important

Pashler, McDaniel, Rohrer, & Bjork,
2009



FROM LEWIS BLACK

A ferociously funny take on all things Yule.

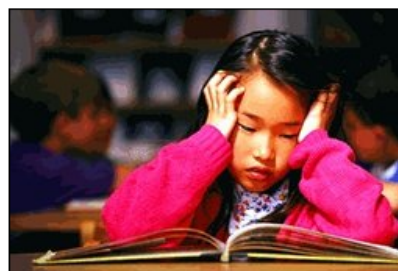


NEWS

Parents Of Nasal Learners Demand Odor-Based Curriculum

MARCH 15, 2000 | ISSUE 36-09

COLUMBUS, OH—Backed by olfactory-education experts, parents of nasal learners are demanding that U.S. public schools provide odor-based curricula for their academically struggling children.

[Enlarge Image](#)


A nasal learner struggles with an odorless textbook.

"Despite the proliferation of countless scholastic tests intended to identify children with special needs, the challenges facing nasal learners continue to be ignored," said Delia Weber, president of Parents Of Nasal Learners, at the group's annual conference. "Every day, I witness firsthand my son Austin's struggle to succeed in a school environment that recognizes the needs of visual, auditory, tactile, and kinesthetic learners but not him."

Weber said she was at her "wit's end" trying to understand why her son was floundering in school when, in May 1997, another parent referred her to the Nasal Learning Research Institute in Columbus. Tested for odor-based information-acquisition aptitude, Austin scored in the 99th percentile.

"My child is *not* stupid," Weber said. "There simply was no way for him to thrive in a school that only caters to traditional students who absorb educational concepts by hearing, reading, seeing, discussing, drawing, building, or acting out."

Austin's experience is not unique.

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Kim Jong-Un Privately Doubting He's Crazy Enough To Run North Korea

Social Security Scam Robs Elderly By Convincing Them They Are Dead



Dating



6. Avoid “either or thinking.”

Extroverts v. Introverts

Lecture v. Engaged Learning

Lecture v. Flipped Classroom

Multitasking – Can’t be done...

Multitasking

86% of students report texting throughout entire class periods.
(McCoy, 2013)

Clifford Nass (Stanford), studies social and psychological impacts of media. His research shows that chronic multitasking were terrible at ignoring irrelevant information; they're terrible at keeping information in their head nicely and neatly organized; and they're terrible at switching from one task to another.....yet they think they are great multitaskers.

(Ophir, Nass, & Wagner, 2009. Proceedings of the National Academy of Sciences)



Multitasking

- Placed in front of a computer with internet and a television for 30 minutes. Estimate how many time switch attention from one to the other.
- Following study session participants asked how many time they had “shifted” attention.
- Estimated Average 15 times....

Actual.....120 times.
Computer average was 6 seconds and TV average was 2 seconds.
(Brasel & Gips, 2011.
Boston College)



Attention

The mere presence of a cell phone has been shown diminish attention and reduce performance on cognitively complex tasks.

(Thornton, Faires, Robbins, & Rollins, 2014)





Photo credit: Auto Repair Match



7. Don't treat the brain as though it worked like a machine and independent of the world.

Learned helplessness

Attribution

Physiological aspect of the brain

Exercise



- Ratey (2008) has shown that exercise increases the production of vital neurotransmitters important for:
 - Focusing and Attention
 - Motivation
 - Patience
 - Mood



Awake, but NOT Learning



Corelli, 2011 notes that when a person's brain is sleep deprived the person may actually feel fully awake and yet the neurons needed for learning and memory shut down. Essentially, basic functions operate, but complex tasks are not encoded.

Sleep and Rest

- Sleep and Rest – Researchers at the NYU's Department of Psychology and Center for Neural Science have found that rest directly after learning increases retention
- A NASA study found astronauts who napped for 27 minutes in the afternoon improved their cognitive functioning on later day tasks by 34% over nonnapping astronauts (Medina, 2008).



Awake, but NOT Learning

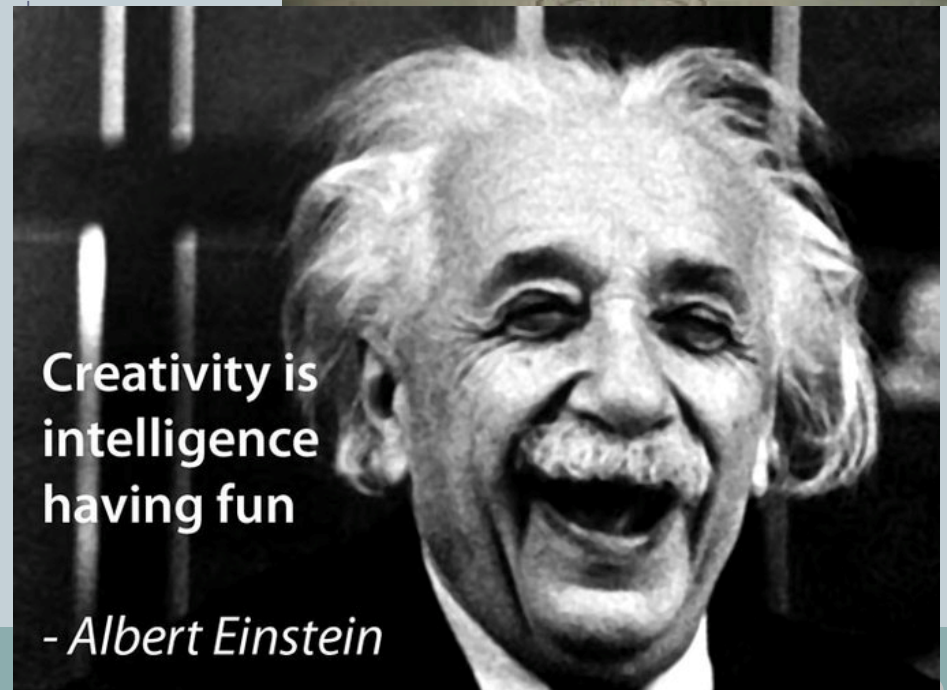


Dangers of blue light and melatonin. Proceedings for the National Academy of Sciences (Nov 2014) found that screen time before bed can be detrimental. In addition to poor cognitive functioning, lack of sleep related to obesity, diabetes, and cardiovascular disease. Chronic suppression of melatonin is even related to certain cancers.

Sleep and Creativity

Sleep also seems to reorganize memories, extracting the emotional details and reconfiguring the memory to help us produce new and creative ideas.

(Wagner, U., Gais, S., Haider, H., Verleger, R., & Born, J. (2004).



Creativity is
intelligence
having fun

- Albert Einstein

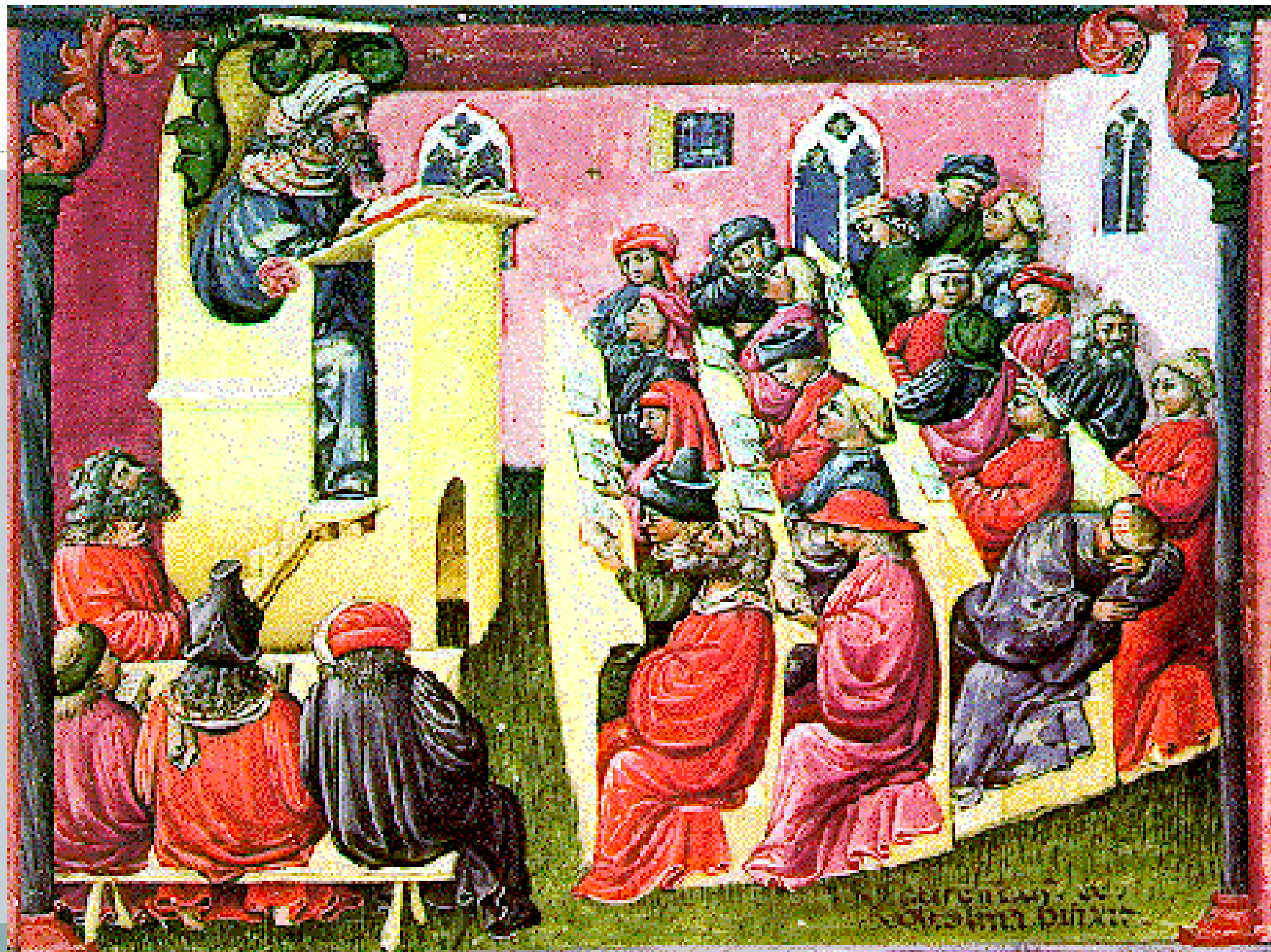
Food/Hydration

- Food (glucose) --- Complex carbohydrates (vegetables and whole grains) MUCH better than simple sugars





**8. What it looks like to be learning is
changing rapidly...**



Teaching Strategies





Photo credit: Home Sessive

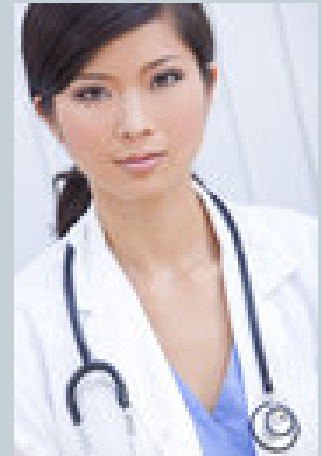


8. Teaching is a VERY complex process...



Teaching is the Profession that Makes All Professions Possible

--Todd Whitaker



World Educational Rankings

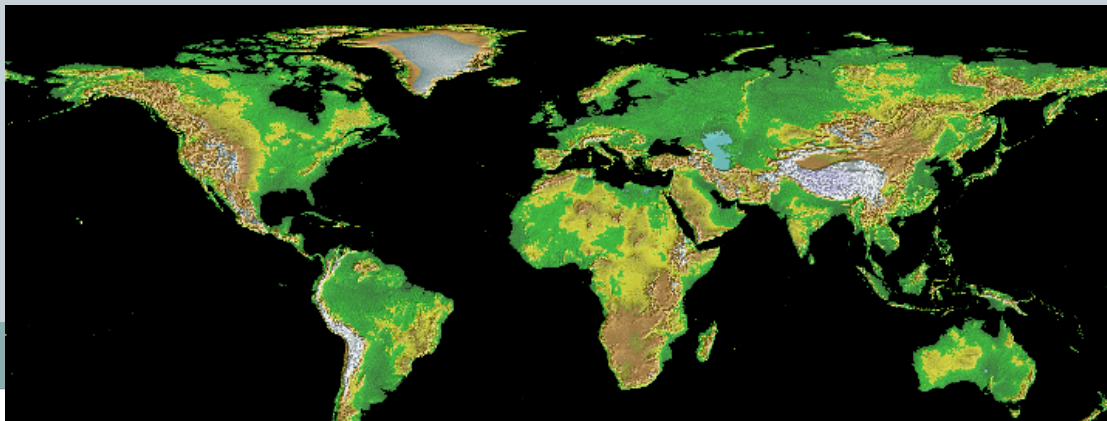


A report recently published by Harvard University's Program on Education Policy and Governance found that students in Latvia, Chile, and Brazil are making gains in academics three times faster than American students, while those in Portugal, Hong Kong, Germany, Poland, Liechtenstein, Slovenia, Colombia and Lithuania are improving at twice the rate.

Achievement and Growth: International and US State Trends in Student Performance

Hanushek, Peterson, Woessmann, Harvard University; July 2012

http://www.hks.harvard.edu/pepg/PDF/Papers/PEPG12-03_CatchingUp.pdf





World Educational Rankings

(Pearson, 2014)



1. South Korea
2. Japan
3. Singapore
4. Hong Kong
5. Finland
6. United Kingdom
7. Canada
8. Netherlands
9. Ireland
10. Poland

11. Denmark
12. Germany
13. Russia
14. United States
15. Australia
16. New Zealand
17. Israel
18. Belgium
19. Czech Republic
20. Switzerland