

~~Six~~ **Five Principles**  
**from Cognitive Science**  
to Help Anyone Create Great Training

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# 3/4

of college grads say  
knowledge in their field  
quickly becomes outdated




# 90%

of college grads agree  
changes require new  
professional skills

Stats: Irvine, A, Stein, J. (2016). *Workforce Learning: A Global Perspective*. Instructure, Inc. *In press*.

Image: *The Transformation of MOD: Adapting to Change in a Dynamic Environment* by Joyce Abbey, NASA. CC By-NC



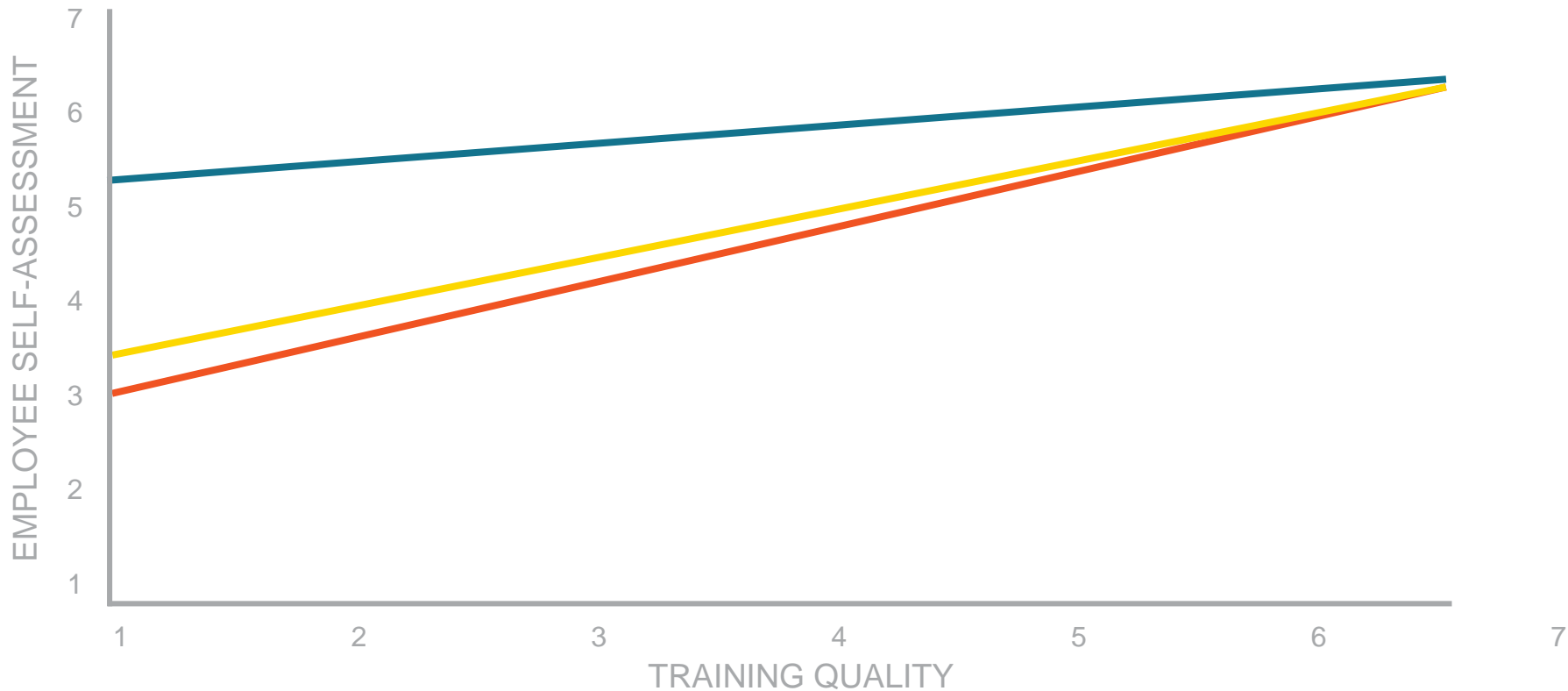
“The fullest representations of humanity show people to be **curious, vital, and self-motivated.**”

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55(1), 68.



# Quality training FTW

■ Self-efficacy (r = .36) ■ Employee engagement (r = .54) ■ Company loyalty (r = .47)



Instructure. (2016). Unpublished survey of employees and managers; n = 2264.

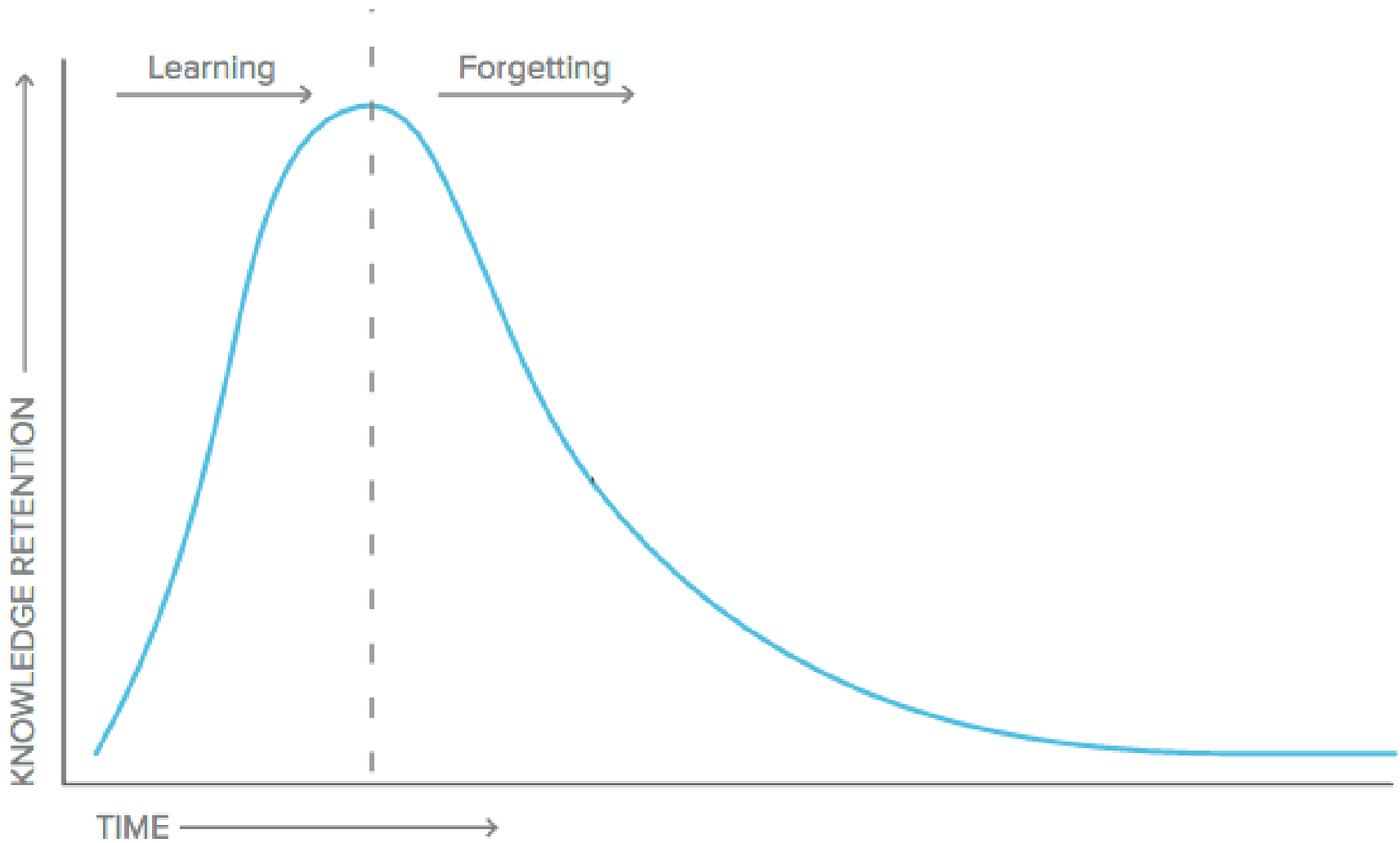
**79:1** Development hours:  
E-Learning hour

Chapman, B. (2010). How Long Does it Take to Create Learning? [Research Study]. Published by Chapman Alliance LLC. [www.chapmanalliance.com](http://www.chapmanalliance.com)



Twitter: @jstein | @getbridge

# “The Forgetting Curve”



E.g. Schacter, Daniel. (2001). The seven sins of memory: how the mind forgets and remembers. Boston: Houghton Mifflin.







# Part One: Keep It Simple

# Part Two: Make It Work



**Keep it Simple**

A man in a white space suit is sitting in a blue chair in a futuristic control room. He is looking forward with a serious expression. The background shows various screens and equipment, suggesting a high-tech environment.

# 41%

 of L&D use video for on-demand learning content

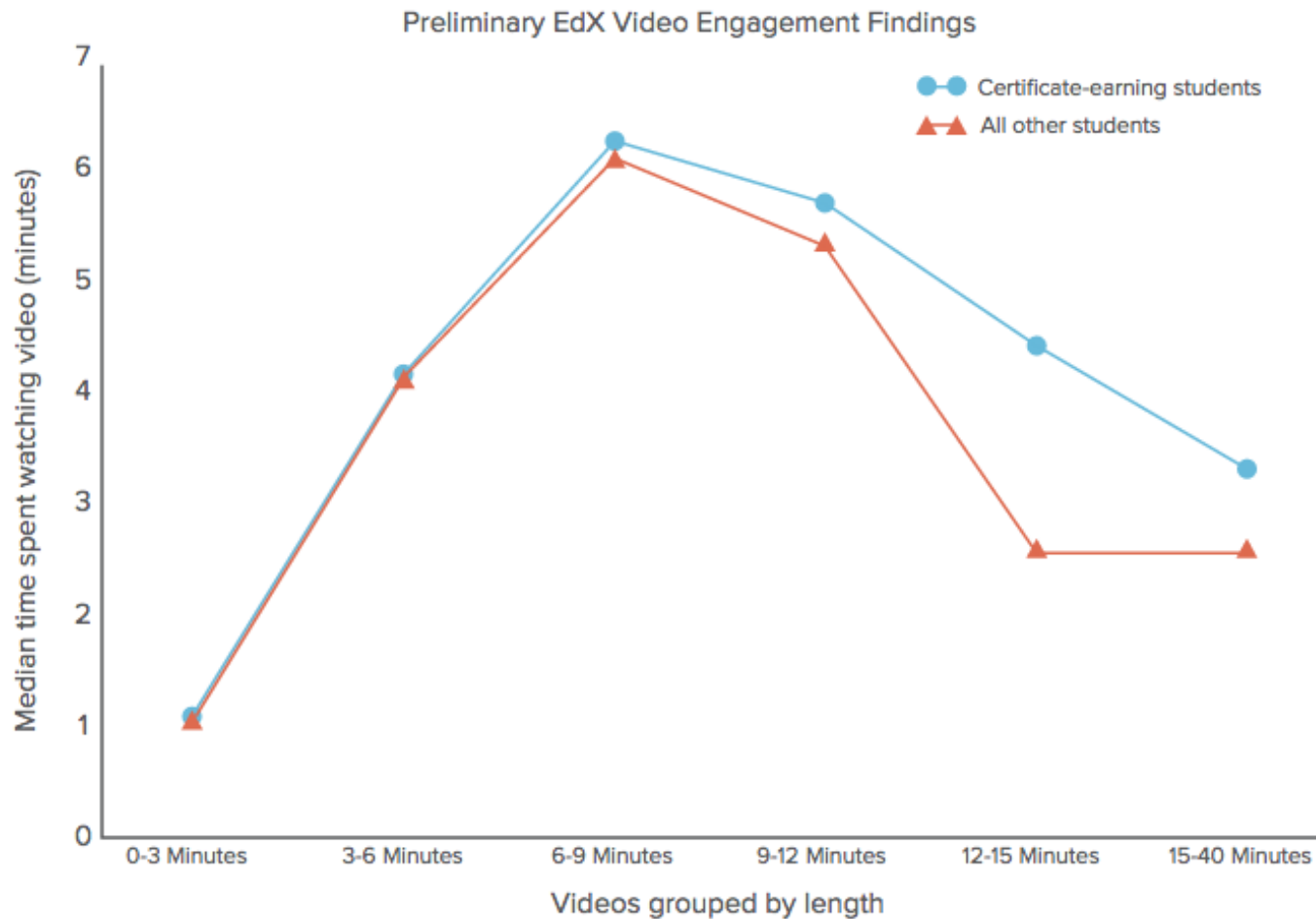
What is the **optimal** video length for attention?

- A. 2-3 minutes
- B. 5 minutes
- C. 10 minutes
- D. 45 minutes
- E. As long as it takes

Source: Bersin. (2011). Next Evolution of Learning Content. Whitepaper.

Image: Gleefully snatched from *The Man Who Fell To Earth*

# Shorter videos hold attention



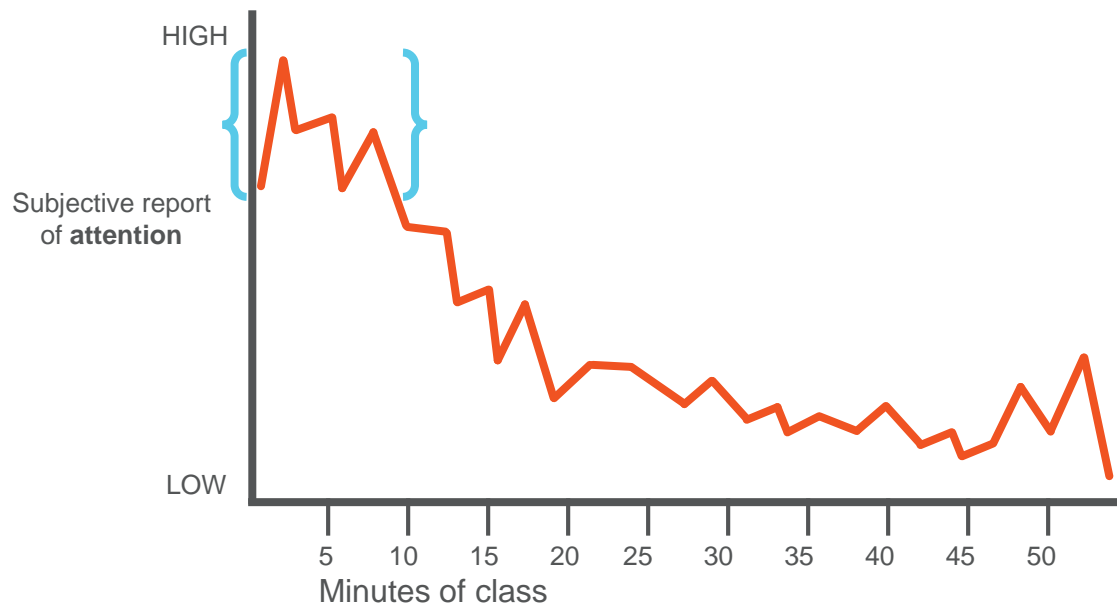
Analysis by Philip Guo (pg@cs.rochester.edu)



# John Medina's 10-minute rule

## John Medina's 10-minute rule

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Medina, John. Brain Rules: 12 Principles for Surviving and Thriving at Work, Home, and School. Pear Press, 2009.

# #1 Less is More

~~Long Videos~~

~~Wordiness~~


~~Decoration~~

BENEFITS  
PSYCHOLOGY  
TANKS

Image: *Creative Feminist Psychology Space Time Tanks*. By Erin Nekervis. On Flickr CC By-NC-SA

Sources: Krug, Steve. (2005). *Don't make me think: A common sense approach to web usability*. Pearson Education.

Clark, Ruth C., Frank Nguyen, and John Sweller. (2011). *Efficiency in learning: Evidence-based guidelines to manage cognitive load*. John Wiley & Sons

The illustration shows The Prince from 'The Little Prince' in a yellow suit, holding onto a large bunch of pink birds. The birds are flying away from him, leaving long, thin lines behind them. The background is a light blue sky with several yellow stars and a yellow sun. The Prince is looking up at the birds with a determined expression.

**“Perfection is achieved not when there is nothing more to add, but when there is nothing left to take away.”**

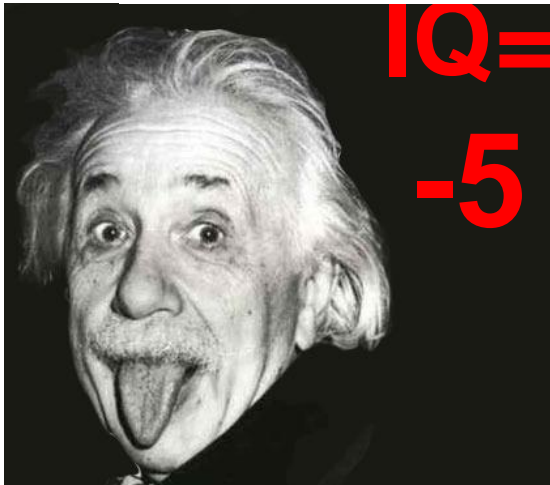
*Antoine de Saint-Exupéry*



# #1 Less is More

	URGENT	LESS URGENT
IMPORTANT	<ul style="list-style-type: none"><li>• Track opps in SFDC</li><li>• Find answers in KB</li><li>• Demo the product</li></ul>	<ul style="list-style-type: none"><li>• Negotiate deals</li><li>• Blah blah blah</li><li>• Yadda yadda</li></ul>
LESS IMPORTANT	<ul style="list-style-type: none"><li>• Tell company story</li><li>• Blah blah blah</li><li>• Yadda yadda</li></ul>	<ul style="list-style-type: none"><li>• Know who does what</li><li>• Blah blah blah</li><li>• Yadda yadda</li></ul>

# Constant multi-tasking



**Source:** Rock, D. (2009). *Your Brain at Work: Strategies for Overcoming Distraction, Regaining Focus, and Working Smarter All Day Long* Harper Business. HarperBusiness.

**Images:** *IMG\_0845\_2*. By Liam//Richards on Flickr. CC By NC SA. *Man Awake In Bed Suffering With Insomnia*. By Spanish Virtually on Flickr.

## #2 Respect Our Limitations





# #2 Respect Our Limitations



# Dual-Channel Theory

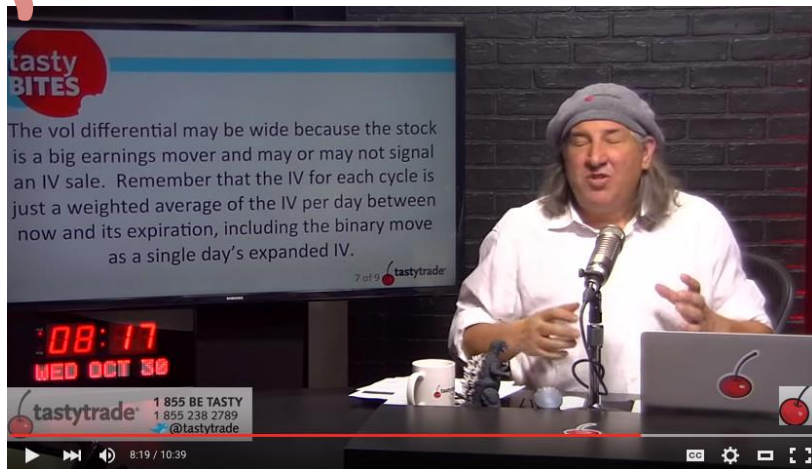


# MORE LEARNING, LESS TIME

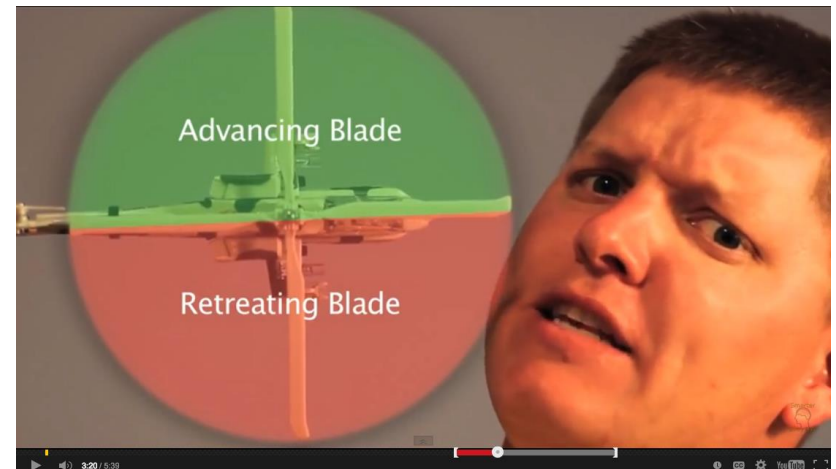


# #2 Respect Our Limitations

## Narration + Text



## Narration + Visuals



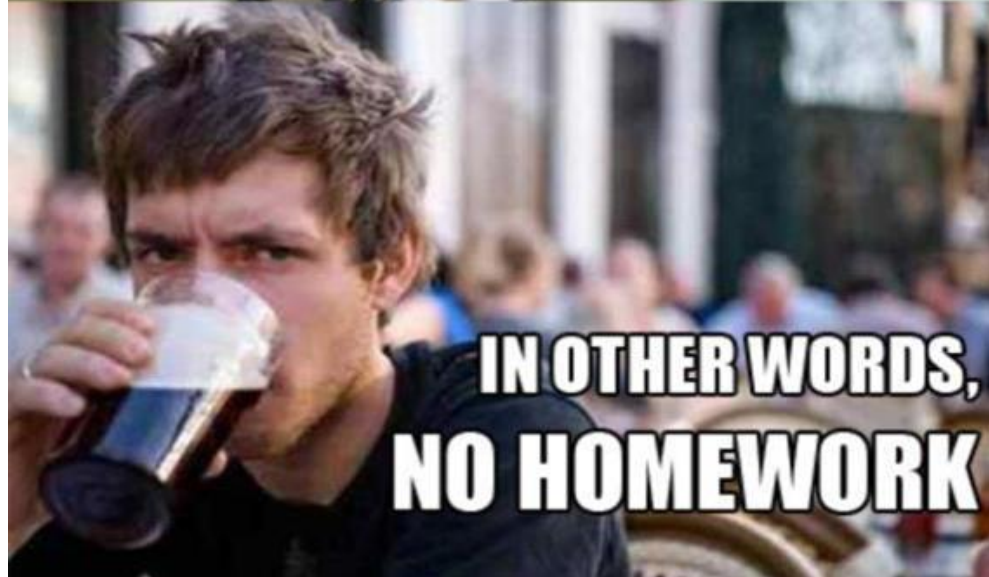
Source: Mayer, Richard E., and Roxana Moreno. "Nine ways to reduce cognitive load in multimedia learning." *Educational psychologist* 38, no. 1 (2003): 43-52.

Videos: tastytrader. Understanding Volatility Contraction Around Earnings. On YouTube.

Smarter Every Day. The Helicopter Speed Limit - Helicopter Physics Series - #7. On YouTube.

**Make it Work.  
Literally.**







A



B



C



D



E



F



G



H



I



J



K



L



M

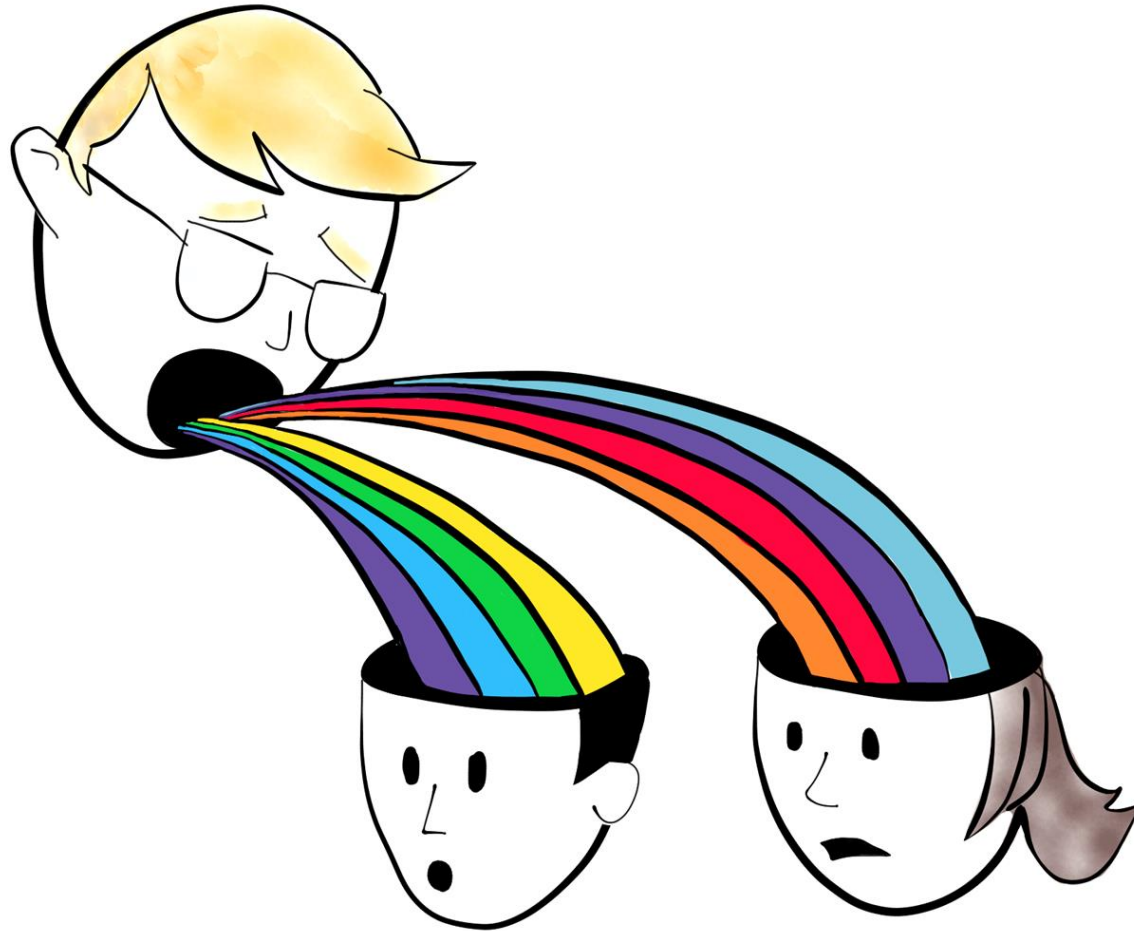


N

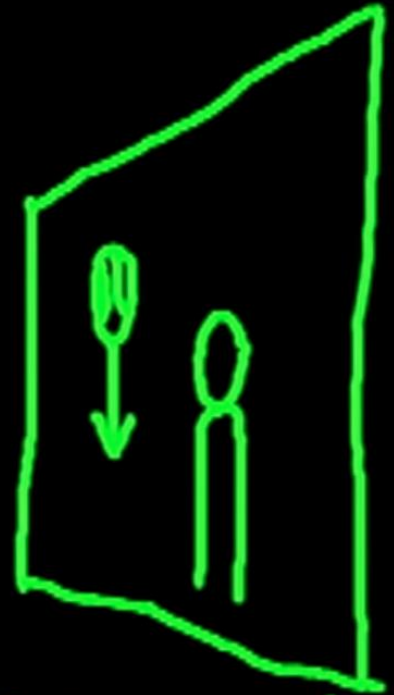


O

# Teaching ≠ Learning



# #3 Pose Problems, Not Answers



Oh, this again  
the force is up



# #3 Pose Problems, Not Answers



**Problem**

How will the slinky fall?

**Challenge**



**Answer**

Source: Muller, Derek A., Manjula D. Sharma, and Peter Reimann. "Raising cognitive load with linear multimedia to promote conceptual change." *Science Education* 92, no. 2 (2008): 278-296.

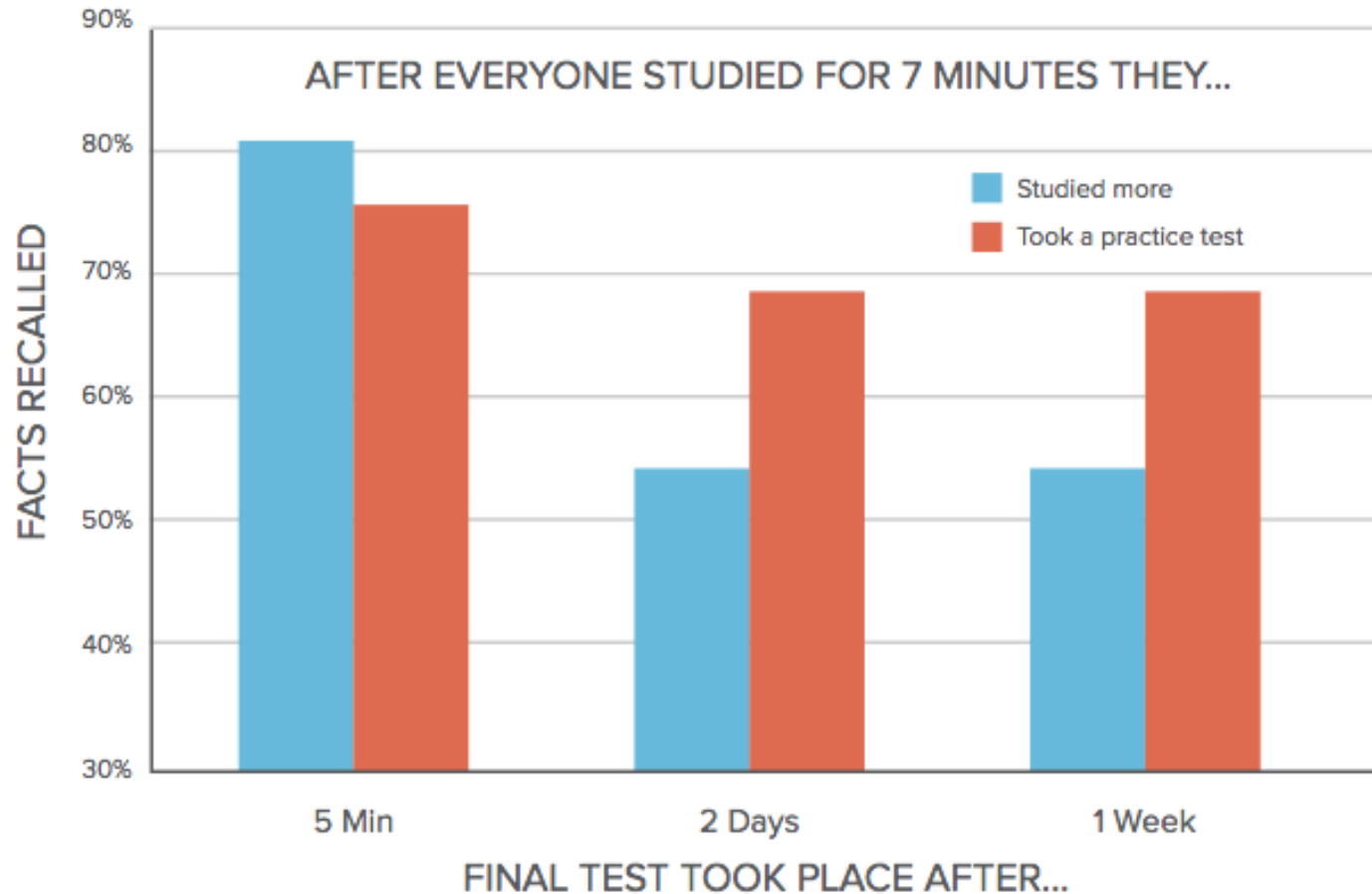
"Veritasium" on YouTube: <https://www.youtube.com/user/1veritasium>

# The “Testing Effect”

1906 Thorndike  
 1909 Abbott  
 1914 Myers  
 1917 Ga  
 1939 Sp  
 1940 So  
 1968 Fis  
 1972 Atl  
 1977 Kr  
 1979 Ba  
 1980 Wi  
 1981 Du  
 1982 Nu  
 1983 Ru  
 1985 Re  
 1986 Re  
 1988 Fo  
 1989 Gl  
 1993 Ba  
 1995, 2  
 2000 Cu  
 2002 Mi  
 2003 Pa  
 2003 Wi  
 2005 Ba  
 2005 Ba  
 2005 Ca  
 2005 Pa  
 2005 Ro  
 2006 Ba  
 2006 Ba  
 2006 Ca  
 2006 Ca

2006 Roediger & Karpicke  
 2006 Rohrer & Tavor

2009 Pyc & Rawson  
 2009 Rohrer



Roediger

2006 J. C. K. Chan, McDermott, & Roediger  
 2006 Roediger & Karpicke

2009 McDaniel, Howard, & Einstein  
 2009 Metcalfe, Kornell, & Finn

2012 McDaniel, Wildman, & Anderson  
 2012 Pyc & Rawson

Roediger, H.L. & Karpicke, J.D. (2006). Test-enhanced learning: Taking memory tests improves long-term retention. *Psychological Science*, 17(3), 249-255.



Twitter: @jstein | @getbridge

# #3 Pose Problems, Not Answers

## How to Identify True Mobilizers

Star and core performers look for very different cues to determine if they're talking to the right customer stakeholder. Core performers look for contacts who are easily accessible, freely share information, and will benefit from a purchase. Moreover, core reps' natural optimism leads them to overestimate a contact's ability to help them. Consequently, core performers gravitate toward Talkers.

Star performers, on the other hand, instinctively recognize if they're dealing with a Mobilizer or Talker, and quickly decide whether to engage or keep hunting for a better contact. The good news is that you can teach core performers to emulate these behaviors by helping them identify the key "tells" of Mobilizers.



Star performers use a narrow set of relatively concrete "tells" and signals to

Which of the following things does a star performer look for in a mobilizer? (choose 1 or more)

- Skepticism
- Interest in socializing
- Self-interest
- Follow-through
- Personal ambition

[CONTINUE](#)

## Engage the Mobilizers

When you look at how much each of these six stakeholder profiles drive organizational action toward a sale, you'll find there's a clear break in terms of their impact:



Star sellers gravitate toward Mobilizers, while core sellers gravitate toward Talkers; in fact, sellers who consistently engage Mobilizers are 31% more likely to be a high performer.

Roediger, Henry L., and Jeffrey D. Karpicke. "Test-enhanced learning taking memory tests improves long-term retention." *Psychological science* 17, no. 3 (2006): 249-255.

# #3 Pose Problems, Not Answers



Who have you worked with that matches “The Go-Getter”? How did they help or hinder the sale?

COMMENTS



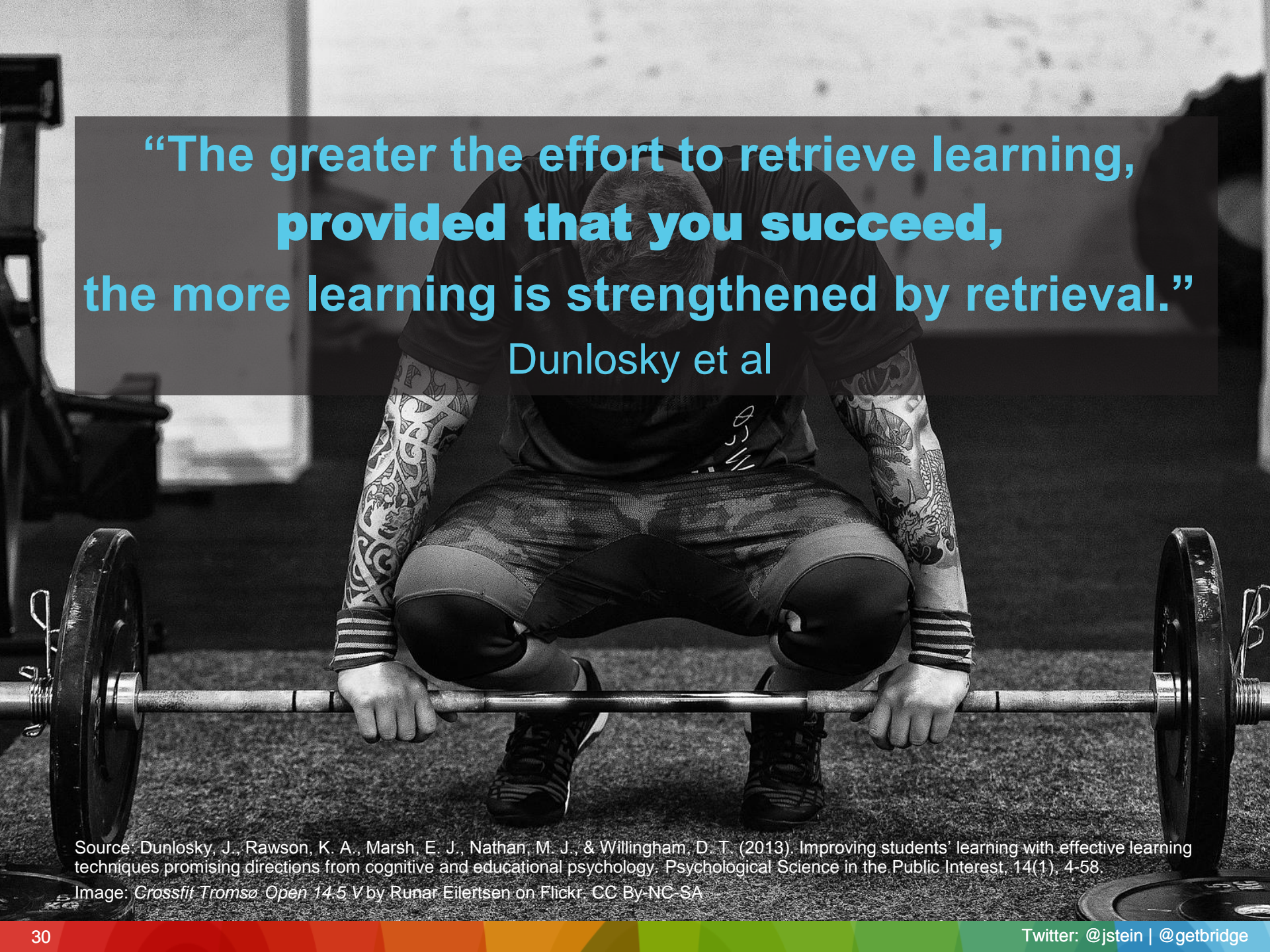
Best



Your comment







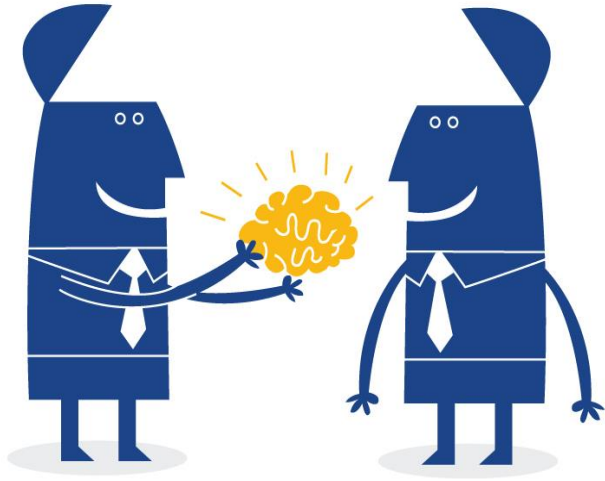
**“The greater the effort to retrieve learning,  
provided that you succeed,  
the more learning is strengthened by retrieval.”**

Dunlosky et al

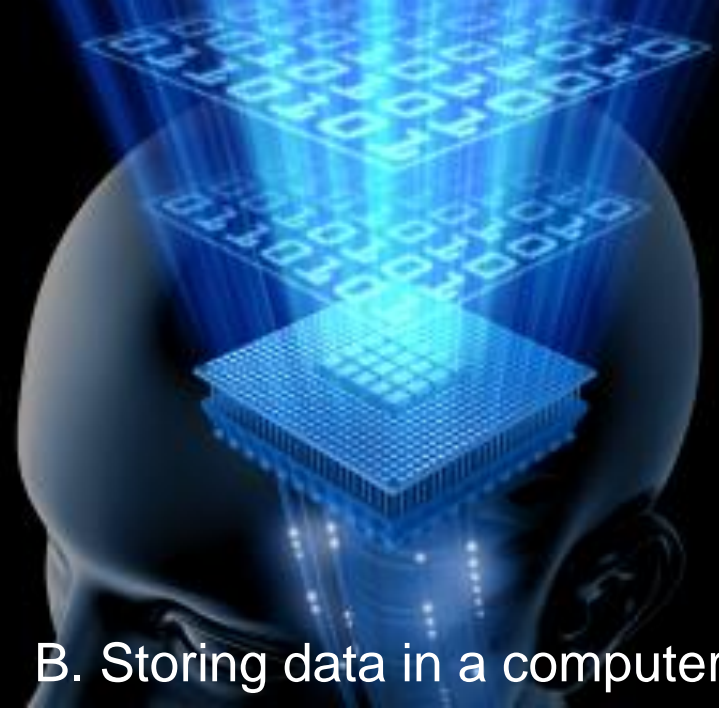
Source: Dunlosky, J., Rawson, K. A., Marsh, E. J., Nathan, M. J., & Willingham, D. T. (2013). Improving students' learning with effective learning techniques promising directions from cognitive and educational psychology. *Psychological Science in the Public Interest*, 14(1), 4-58.

Image: *Crossfit Tromsø Open 14.5 V* by Runar Eiletsen on Flickr. CC BY-NC-SA





A. Transferring knowledge to a vessel



B. Storing data in a computer



C. Planting seeds in a garden



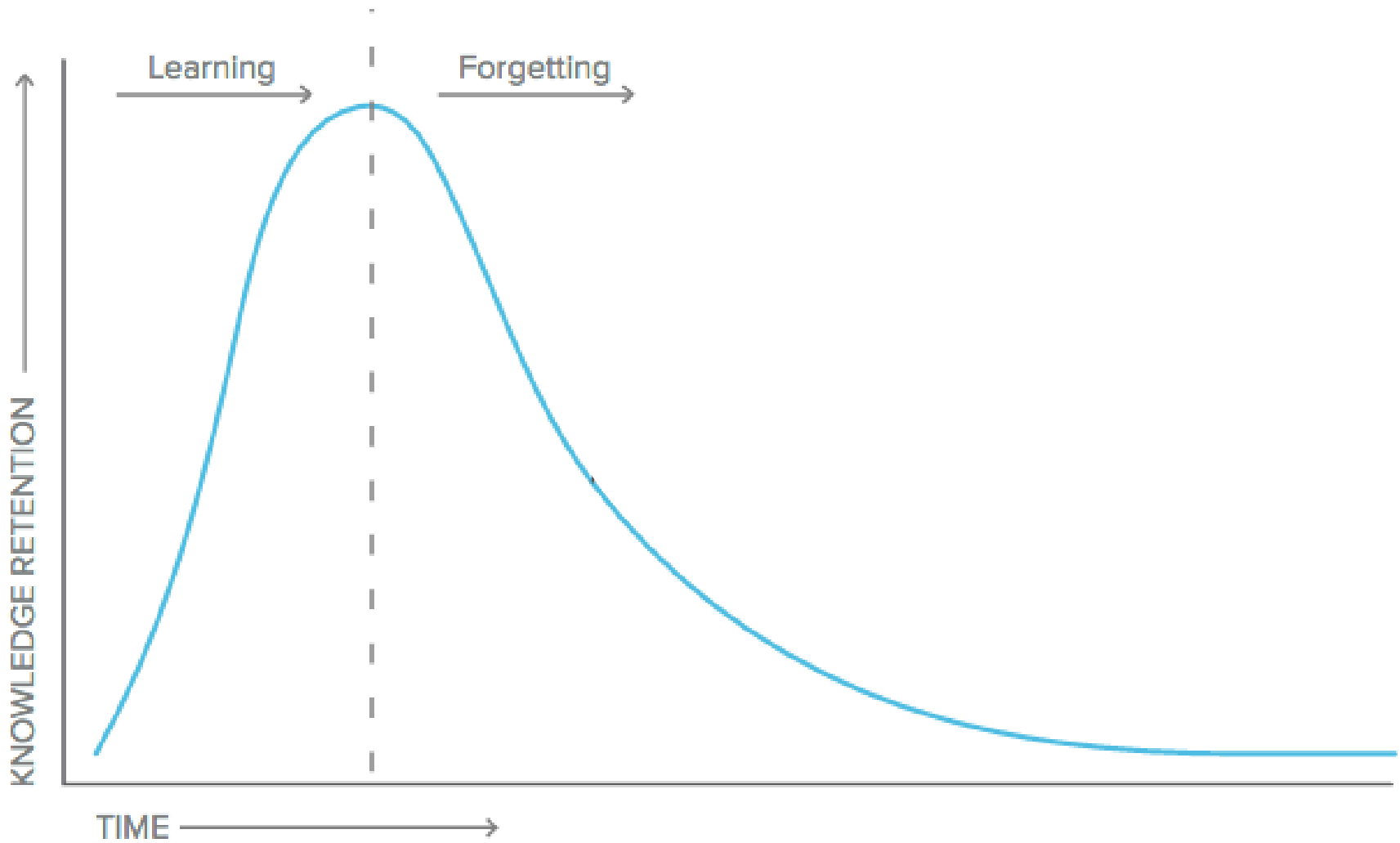
D. Exercising a muscle



# #4 Practice, \_\_\_\_\_, Practice



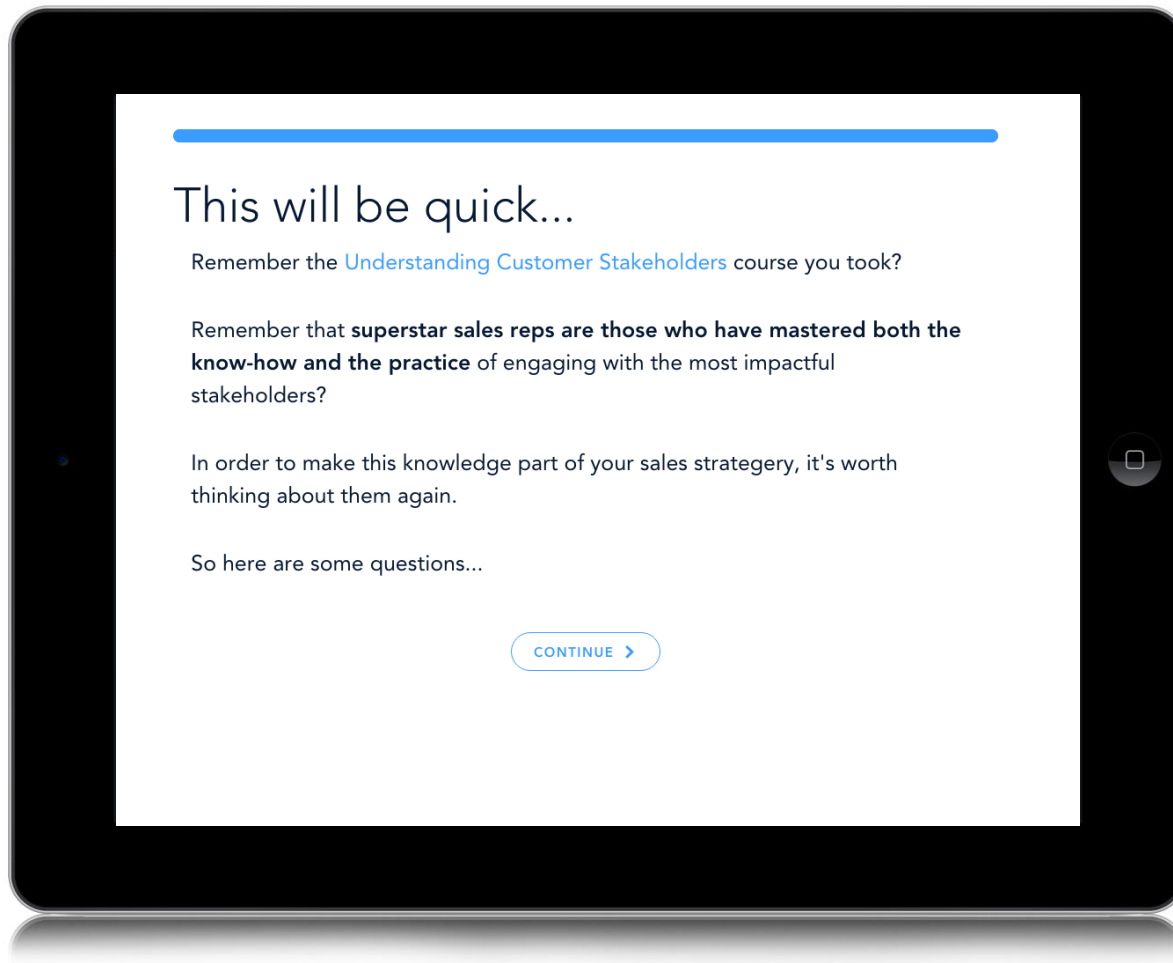
# “The Forgetting Curve”



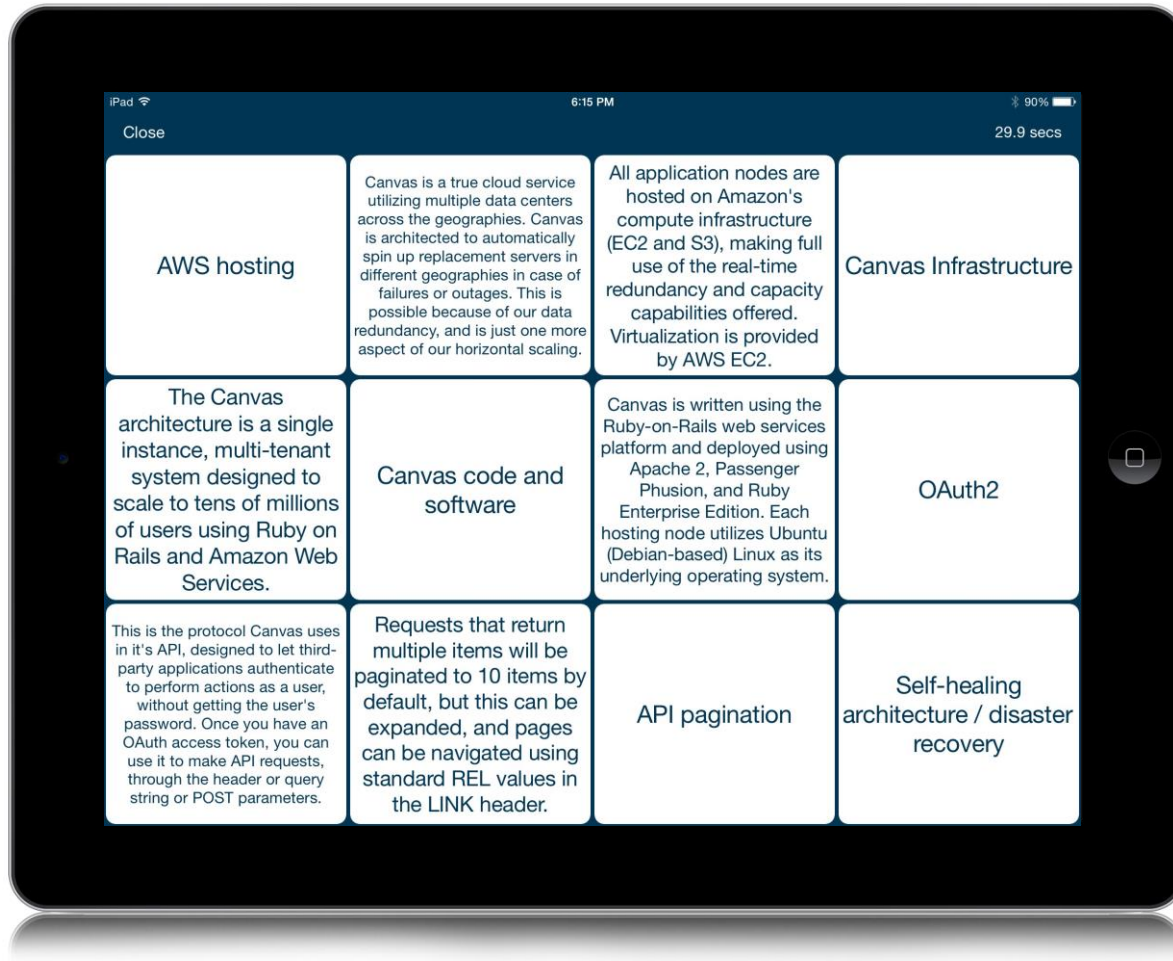
E.g. Schacter, Daniel. (2001). The seven sins of memory: how the mind forgets and remembers. Boston: Houghton Mifflin.



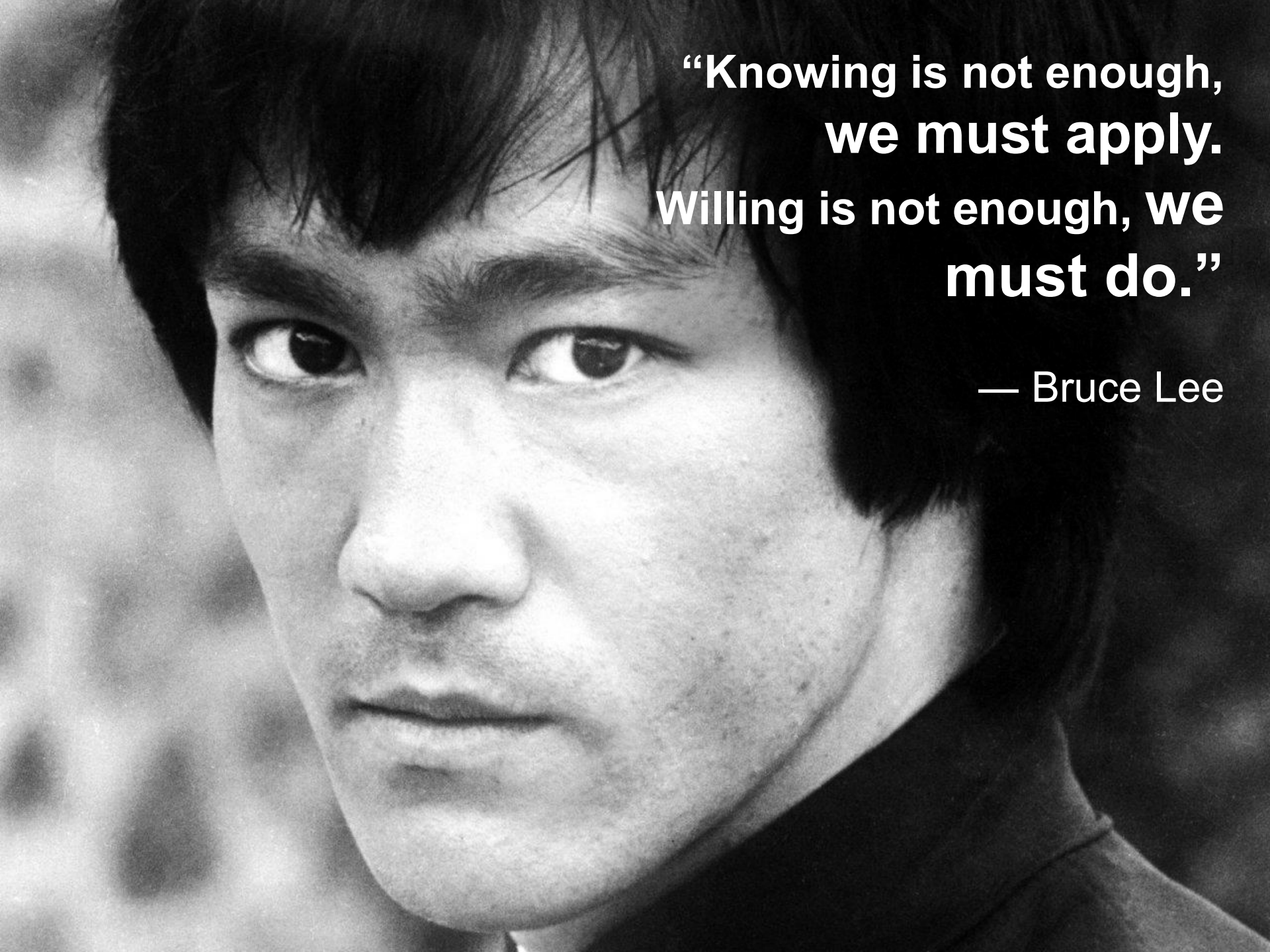
# #4 Practice, \_\_\_\_\_, Practice



# #4 Practice, \_\_\_\_\_, Practice

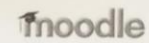


e.g. quizlet.com




**“Knowing is not enough,  
we must apply.  
Willing is not enough, WE  
must do.”**

— Bruce Lee

moodle

*"Moodle lets you customize everything. I can even change code myself to achieve the effect I want. And have you seen how many plug-ins are available?"*

brightspace  
by B2i

*"We're cloud, too, but better: We offer a private cloud so you have more control."*

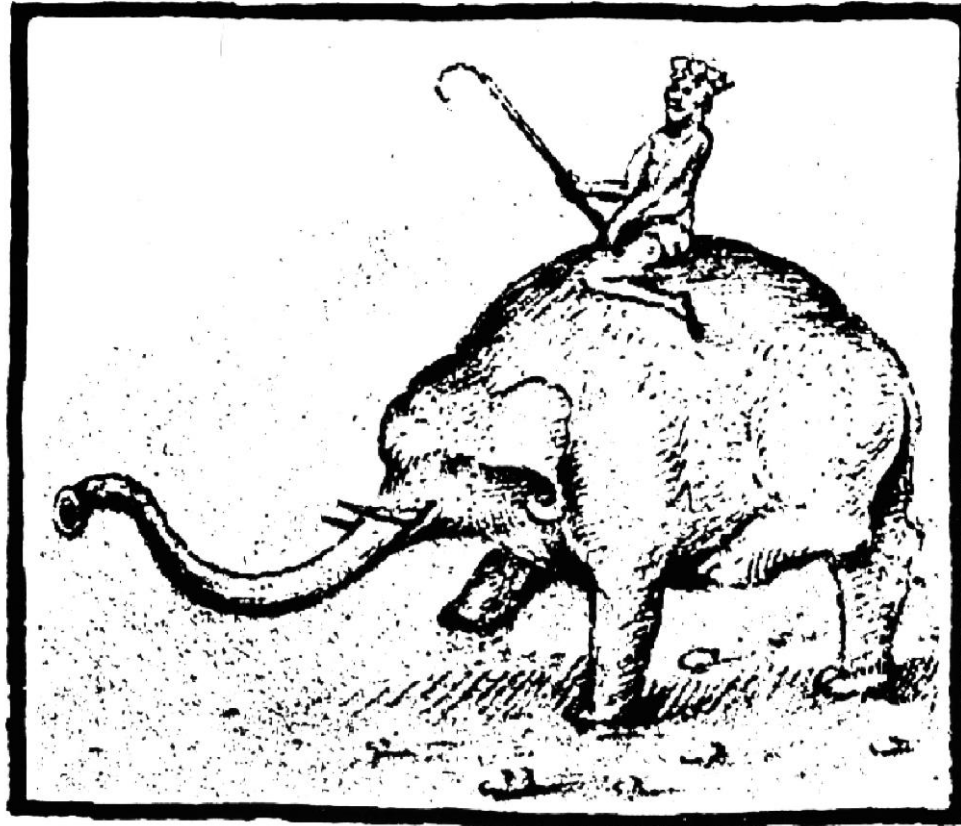
Bb

Blackboard

*"Blackboard is the most feature-rich LMS on the market, putting more power and options into the hands of every teacher."*



# #5 Engage the Elephant...



Dirksen, Julie. Design for how people learn. New Riders, 2011.



# Star Wars: The Force Awakens trailer



(X-Wings, TIE Fighters, The Falcon, wtf sabre)



Scared brother  
Stormtrooper on  
Tatooine! OMG



That's right, "We're  
@#\$%! home!"  
\*sniff\*

# #5 Engage the Elephant...

- Inspire them

“This past January, four of our 67 sales reps stood to full applause from the rest of the company as they were added to the President’s Club.”

- Scare them

“It’s March 15<sup>th</sup> and your manager calls demanding to know why you are \$50K shy of your quarterly goal. You’re on your way back from soccer practice. What do you do?”

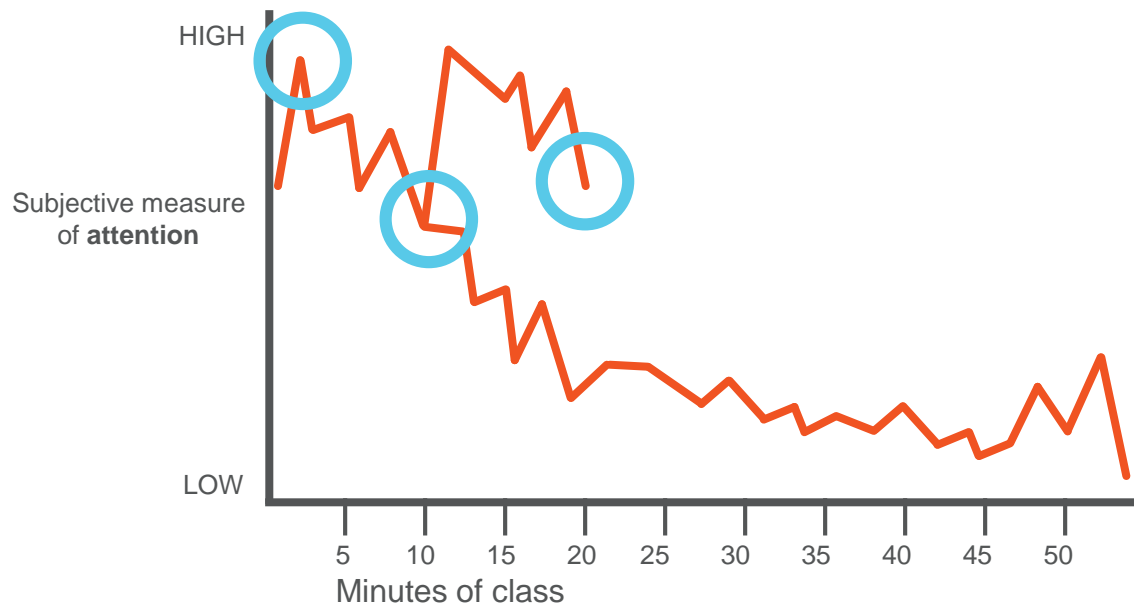
- Tantalize them

“You won’t believe what one thing made the difference between star performers and mediocre performers. What’s better: It doesn’t take the star performers any more time out of their week.”

# #5 Engage the Elephant & Bait the Hook

John Medina's 10-minute rule

“We Don't Pay Attention to Boring Things.”



Medina, John. Brain Rules: 12 Principles for Surviving and Thriving at Work, Home, and School. Pear Press, 2009.

# Kinds of Cognitive Load



e.g. Clark, Ruth C., Frank Nguyen, and John Sweller. "Weed Your Training to Manage Limited Working Memory Capacity". In Efficiency in learning: Evidence-based guidelines to manage cognitive load. John Wiley & Sons, 2011.

"Our evolutionary lineage is marked by mastery of change.

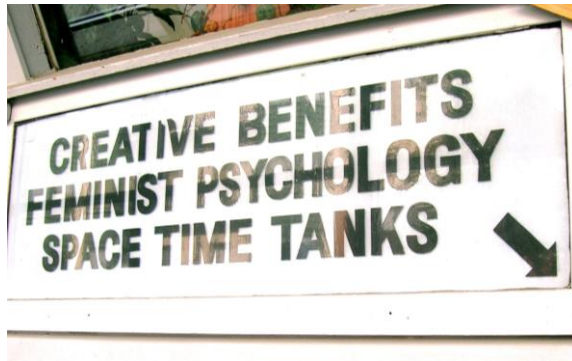


**In our time, the pace is quickening.”**

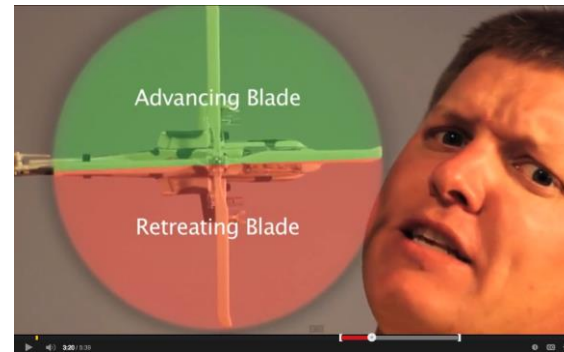
*Carl Sagan*



# What We Learned



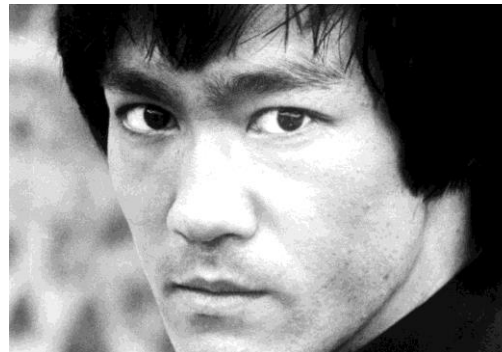
#1 Less is More



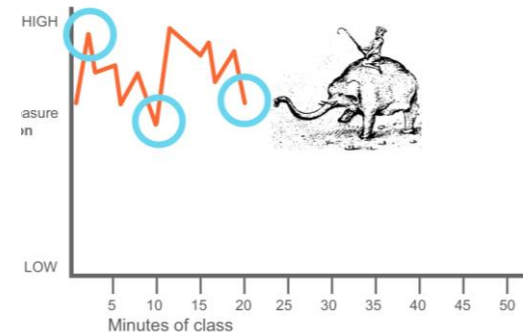
#2 Respect Our Limitations



#3 Pose Problems, Not Answers



#4 Practice, \_\_\_\_\_, Practice



#5 Engage the Elephant & Bait the Hook

**Thank You!**