

Deliberate Practice as a Guide to Active Learning

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Views and the Literature on Active Learning

Goffe & Kauper, “A Survey of Principles Instructors: Why Lecture Prevails,” 2014

Freeman et al., “Active Learning Increases Student Performance in Science, Engineering, and Mathematics,” 2014

Kozanitis and Nenciovici, “Effect of Active Learning Versus Traditional Lecturing on the Learning Achievement of College Students in Humanities and Social Sciences: a Meta-Analysis,” 2023

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Literature on the Effectiveness of Active Learning

What does active learning look like?

Lombardi, et al., “The Curious Construct of Active Learning,” 2021

“However, active learning can mean many things, often different things, to many people. Therefore, as an umbrella term, active learning is not a useful concept for advancing research on effective undergraduate STEM learning.”

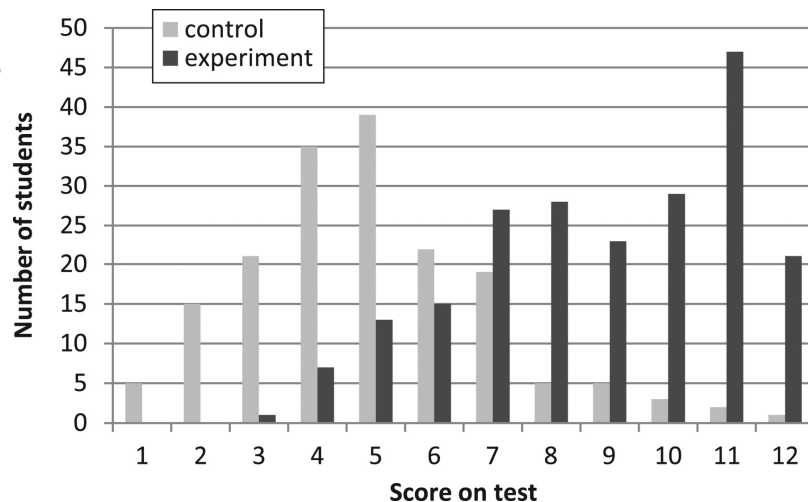
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Question:

Here’s the result of a study involving two large classes.

Which used clickers?

Deslauriers, Schelew,
Wieman, “Improved
Learning in a Large-
Enrollment Physics
Class,” 2011



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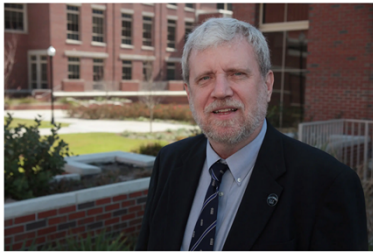
Deliberate Practice & Anders Ericsson

The New York Times

Anders Ericsson, Psychologist and 'Expert on Experts,' Dies at 72

His research helped inspire "Outliers," Malcolm Gladwell's best-selling book on the keys to excelling.

Share full article



Anders Ericsson at Florida State University, where he studied elite performers and concluded that expertise is acquired. As proof, he would have students learn a new skill like juggling during the semester. via Florida State University

David Card: 98,000

Greg Mankiw: 122,000

Paul Romer: 130,000

Herbert Simon: 463,000

"Among psychologists, he's known as the researcher who has done the most to advance our understanding of the nature of expertise, and especially, how it's gained."

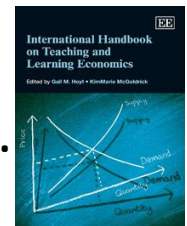
Dan Willingham, review of "Peak" by Ericsson and Pool (2016)

114,000 citations

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Deliberate Practice (Ericsson & Pool, 2016)

- 1. Deliberate practice involves skills others have & training is overseen by someone familiar with the skills of elite performers.**
- 2. Tasks are quite challenging.**
- 3. There are specific goals that can be arranged hierarchically.**
- 4. It requires the student's full attention and concentration.**
- 5. It involves extensive feedback and with time, the student learns to generate their own feedback. This involves "schemas."**
- 6. Schemas are improved as the student's skill increases and this aids further improvements in skills.**
- 7. It typically involves improving existing skills. Thus, fundamental skills are particularly important.**



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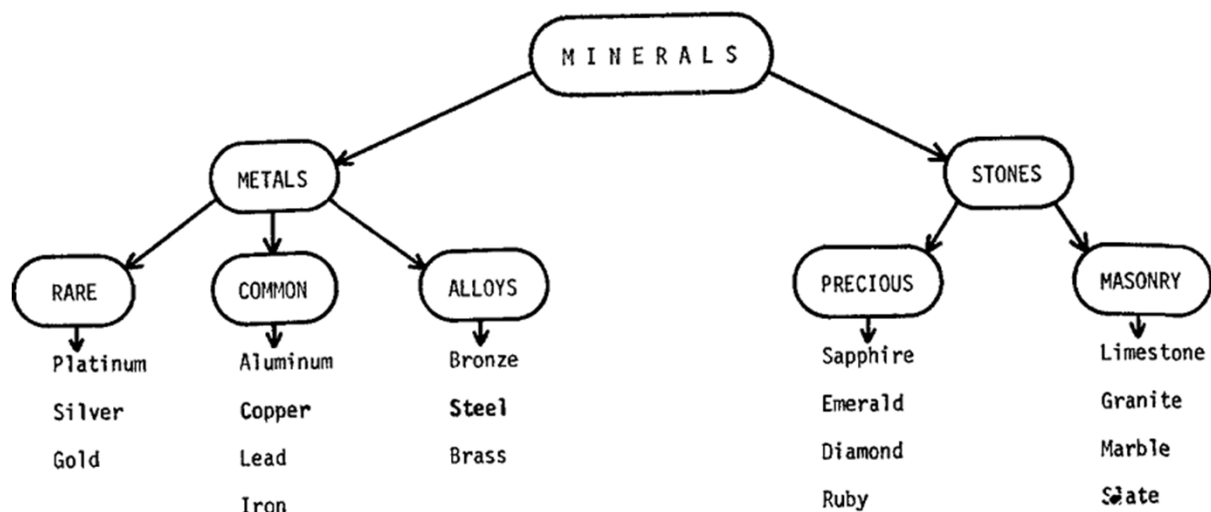
Schemas

limestone – stone / masonry
ruby – stone / precious
silver – metal / rare
diamond – stone / precious
slate – stone / masonry
granite – stone / masonry
gold – metal / precious
lead – metal common
bronze – metal / alloy

marble – stone / masonry
platinum – metal / rare
aluminum – metal / common
copper – metal / common
sapphire – stone / precious
iron – metal / common
emerald – stone / precious
steel – metal / alloy
brass – metal / alloy

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Schemas



“Hierarchical Retrieval Schemes in Recall of Categorized Word Lists,” Bower et al., 1969

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Schemas

- A. The price of widget goes from \$1.30 to \$1.50, and the quantity demand falls from 2,500 units to 2,000 units. Calculate the own price elasticity using the midpoint formula.
1. -2.0 2. -1.6 3. -1.4 4. -1.2 5. -1.0
- B. Which best explains the concept of own price elasticity?
1. how a change in quantity demand leads to a change in a price
 2. how a change in a price leads to a change in quantity demanded
 3. it is the slope of the demand curve
 4. it is the inverse of the slope of the demand curve

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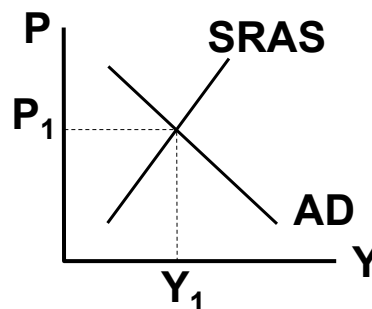
Schemas

Key Symbols

Question: How many of the following could **not** be directly measured by P or Y?

expansions, inflation, unemployment rate, deflation, recessions, federal funds rate, & disinflation

- A. 0 B. 1 C. 2
D. 3 E. 4



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Schema Development

1. Measuring the Economy
2. Why Economies Grow in the Long-Run
 - A. Rates of Economic Growth
 - B. Growth – “Zero-Sum?”
 - C. Role of Capital (K) & Tech. (A) in Growth (P.5)
 - D. Role of Markets & Institutions in Growth
 - civilization recap
 - markets
 - North and South Korea
 - market examples
 - how to get more educated workers?
 - what drives gasoline prices?
 - creative destruction
 - summary of market economies & growth
 - economic systems
 - markets – why not so popular?
 - institutions
 - markets & institutions
 - where do institutions come from?
 - what England got right?
 - E. U.S. Growth Equally Shared?
 - F. Growth Over the Next 30 Years
3. The Labor Market and the Business Cycle
4. Explaining the Economy’s Movements in the Short-Run

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Schemas and Engagement

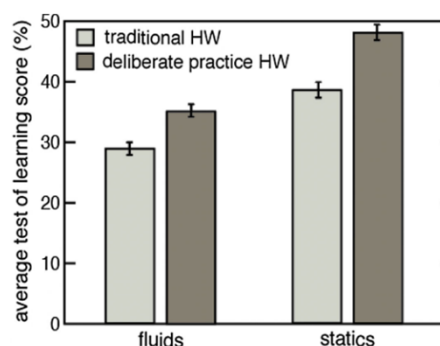
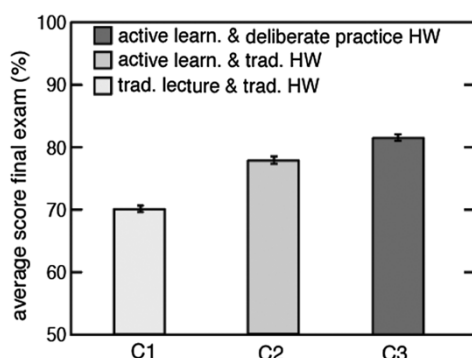
“We should think about what our assignments are making students think about. The assignments that are best for learning go beyond engagement. They make students elaborate on concepts by making meaningful associations, they emphasize key distinctions among different concepts, and they require students to apply concepts in new ways.”

**Stephen Chew, “Student Engagement Is Not Student Learning,”
2022**

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Subskills

Miller, Callaghan, McCarty, & Deslauriers, "Increasing the Effectiveness of Active Learning Using Deliberate Practice: A Homework Transformation," 2021



Us: Change in demand versus change in quantity demanded?

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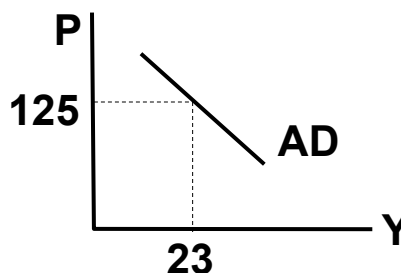
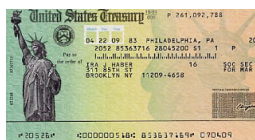
Subskills

Aggregate Demand (AD) [5th in a series]

Question: How many of the following will shift the AD curve **right**?

- U.S. \$ depreciates relative to the €
- foreign income ↑
- transfer payments ↑
- wealth ↑
- # firms ↓
- T (taxes) ↓
- P ↑

- A. 1 B. 2
C. 3 D. 4
E. 5



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Next?

“It is now well established that nearly any form of active learning will produce better student outcomes than traditional lecture-based instruction. There is no need to conduct additional research on this point. What is needed, though, are studies to better understand how to optimize active learning.”

Dancy, et al., “Physics Instructors’ Knowledge and Use of Active Learning has Increased Over the Last Decade But Most Still Lecture Too Much,” 2024

Economists should study the impact of building schemas & subskills in the different ways active learning is implemented.

Include subskills and schema development in your teaching.

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