The lecturer who dislikes lecturing

Christian Jørgensen

Department of Biology, University of Bergen

bioCEED
Centre of Excellence in Biology Education

Sensing	Abstraction
Feelings	Analysis
Processes	Results
Extroversion	Introversion

Myers-Briggs personality types

«Entertainer»	«Researcher»
Sensing	Abstraction
Feelings	Analysis
Processes	Results
Extroversion	Introversion

Photo: Woomiusee

Improved Learning in a Large-Enrollment Physics Class

Louis Deslauriers,[1,2] Ellen Schelew,[2] Carl Wieman*†‡

We compared the amounts of learning achieved using two different instructional approaches under controlled conditions. We measured the learning of a specific set of topics and objectives when taught by 3 hours of traditional lecture given by an experienced highly rated instructor and 3 hours of instruction given by a trained but inexperienced instructor using instruction based on research in cognitive psychology and physics education. The comparison was made between two large sections ($N = 267$ and $N = 271$) of an introductory undergraduate physics course. We found increased student attendance, higher engagement, and more than twice the learning in the section taught using research-based instruction.

Science

Deslauriers L, Schelew E, Wieman C. 2011. Improved learning in a large-enrollment physics class. *Science* **332**: 862-864.

Carl Wieman

Carl Wieman

University science professors preach a gospel of seeking truth through data and careful experimentation, yet when they walk into a classroom, they use methods that are outmoded and ineffective.”

Use your **inquisitive mind** in the lecture hall too!

Wieman C. Stop lecturing me. *Scientific American,* 15 July 2014.

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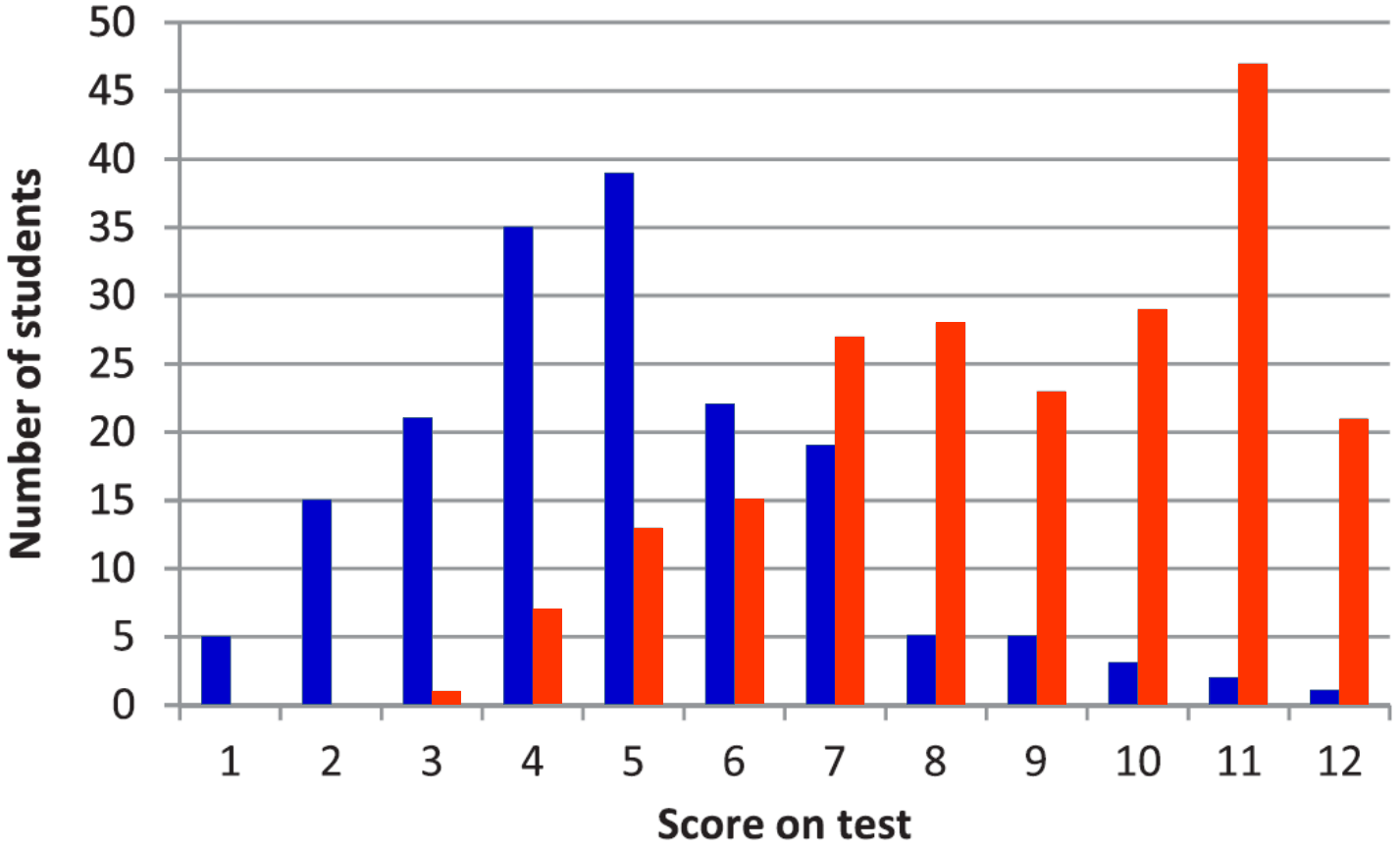
Traditional lectures by the most popular teacher

Active learning methods by inexperienced postdoc



Science

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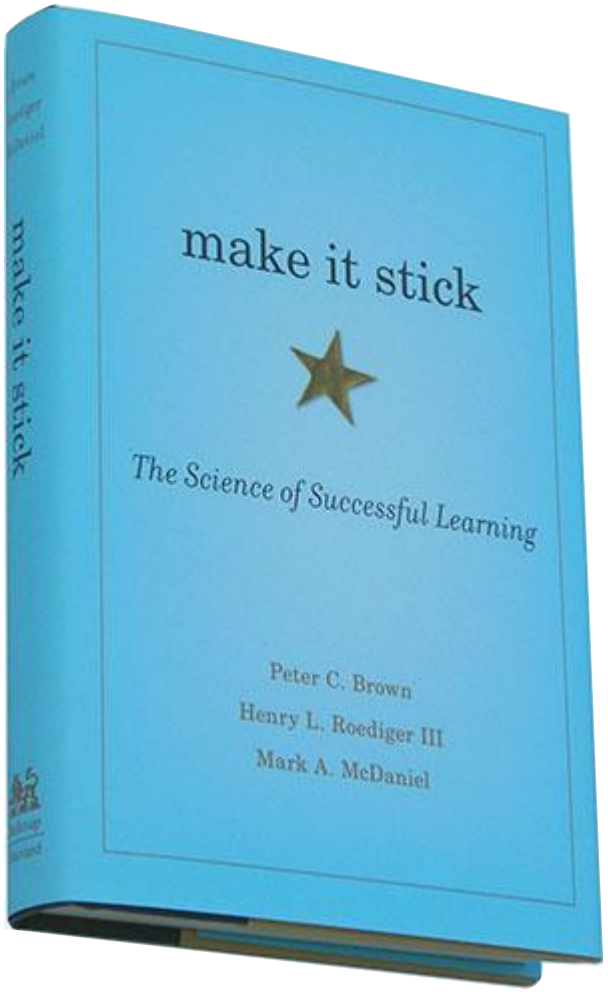
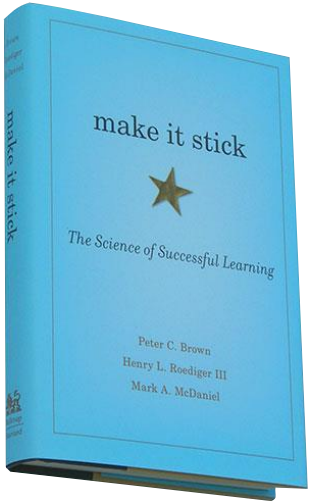
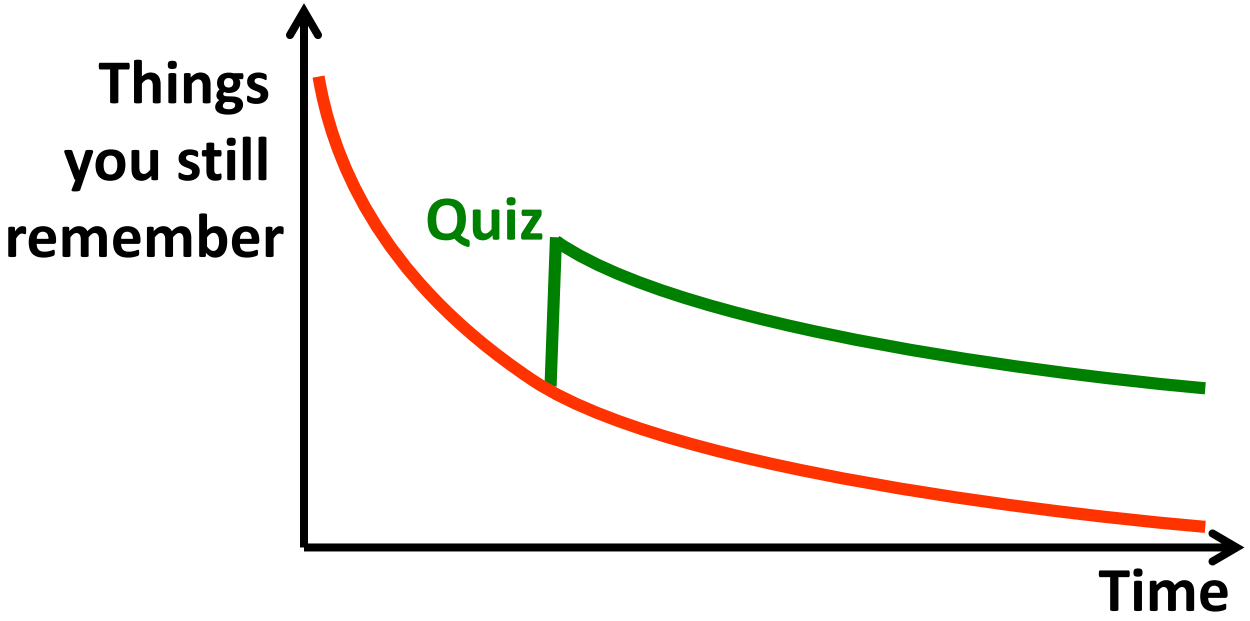
Make it stick

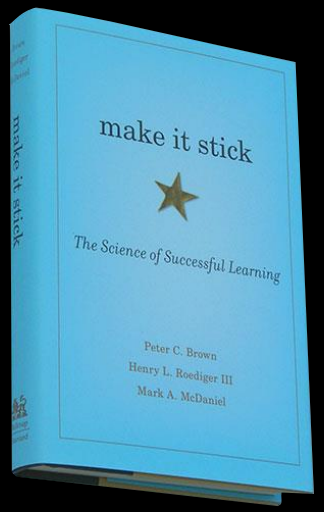
-The science of successful learning



"One of the most striking research findings is the power of active retrieval —**testing**— to strengthen memory"

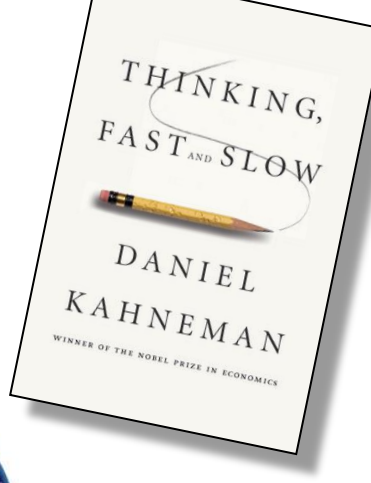


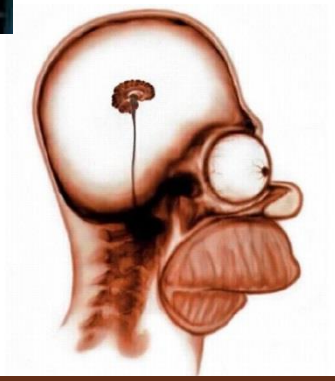




Students prefer
teaching methods
that are **comfortable**
but among the least productive.

Daniel Kahneman





System 1 – Intuition

- Monitoring, context.
- Multiple senses.
- **Suggests** solutions.
- Directs attention.

System 2 – Rationality

- Is logical, requires **thinking**.
- Energy-demanding, you feel **tired**.

A book and a pencil together
cost 11 kroner.
The book costs 10 kroner more than the pencil.
How much is the pencil?

Students at **Princeton University**, 3 tasks

- With **clear print**: 10% had all correct.
- With blurred print: 65% had all correct!

When reading is demanding the brain activates **rationality**, which rejected the wrong answer suggested by **intuition**.

Cognitive load, regardless of origin, mobilizes rationality.

Tips to get started

Common for many active teaching methods:
students need to **generate** their knowledge.

Two simple forms for active teaching:

1. **Stop** lecturing ten minutes before you usually do.
2. Ask students to **write down** what they have learned.

1. **Show a diagram** you usually have in your lecture.
2. Have **students explain it** to each other rather than you do it.

Feedback using smartphones

- Students receive immediate feedback:
  - **dopamine,**
  - benchmarking.
- Just-in-time teaching: **what are students struggling with?**

Photo: Paul Sigve Amundsen

John Biggs

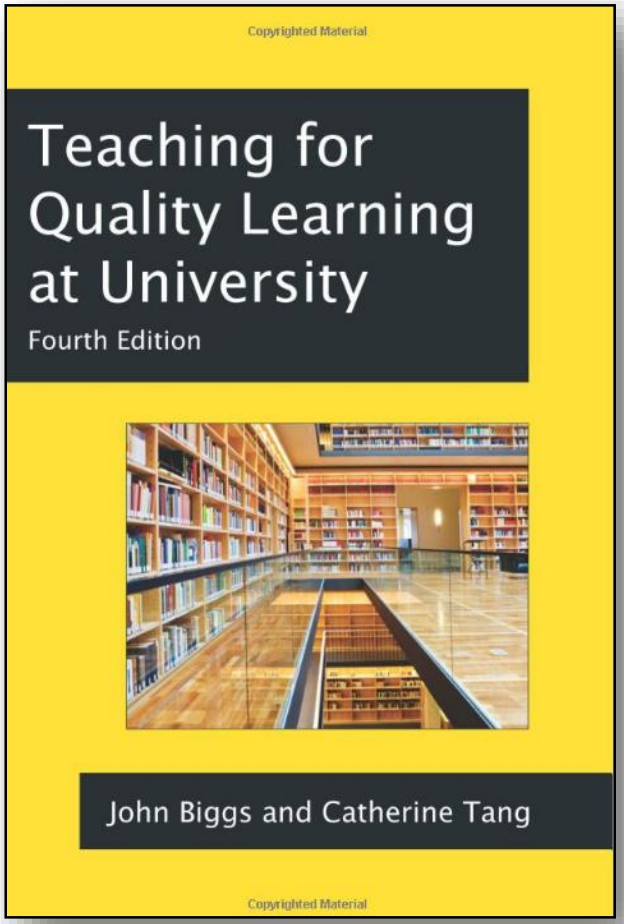
Level 1. What the **student is**.

«Blame the student».

Level 2. What the **teacher does**.

«Blame the teacher».

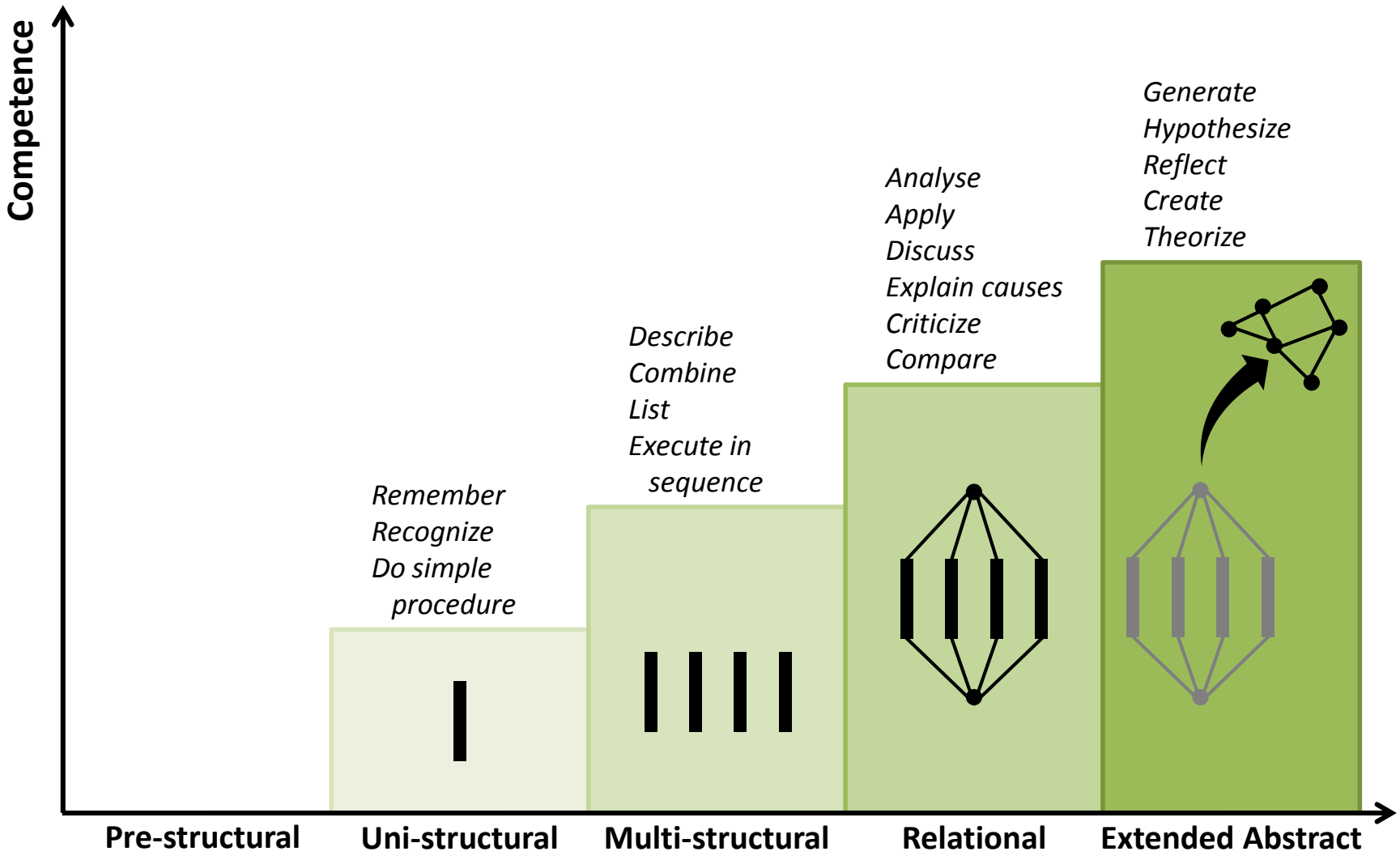
Level 3. What the **student does**.

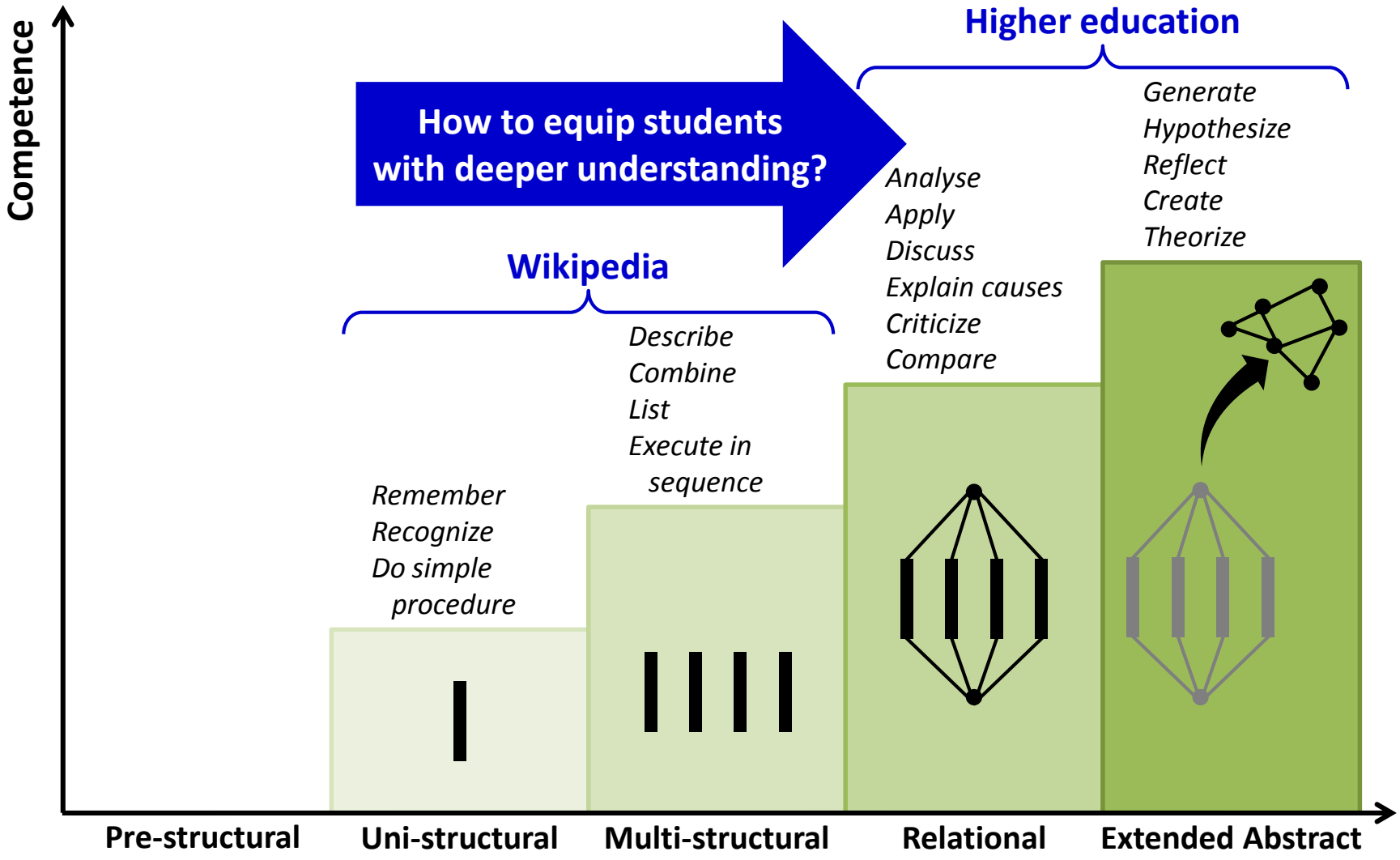


Analysis of modern higher education– challenges and solutions!
Its thinking underlies the Bologna process.

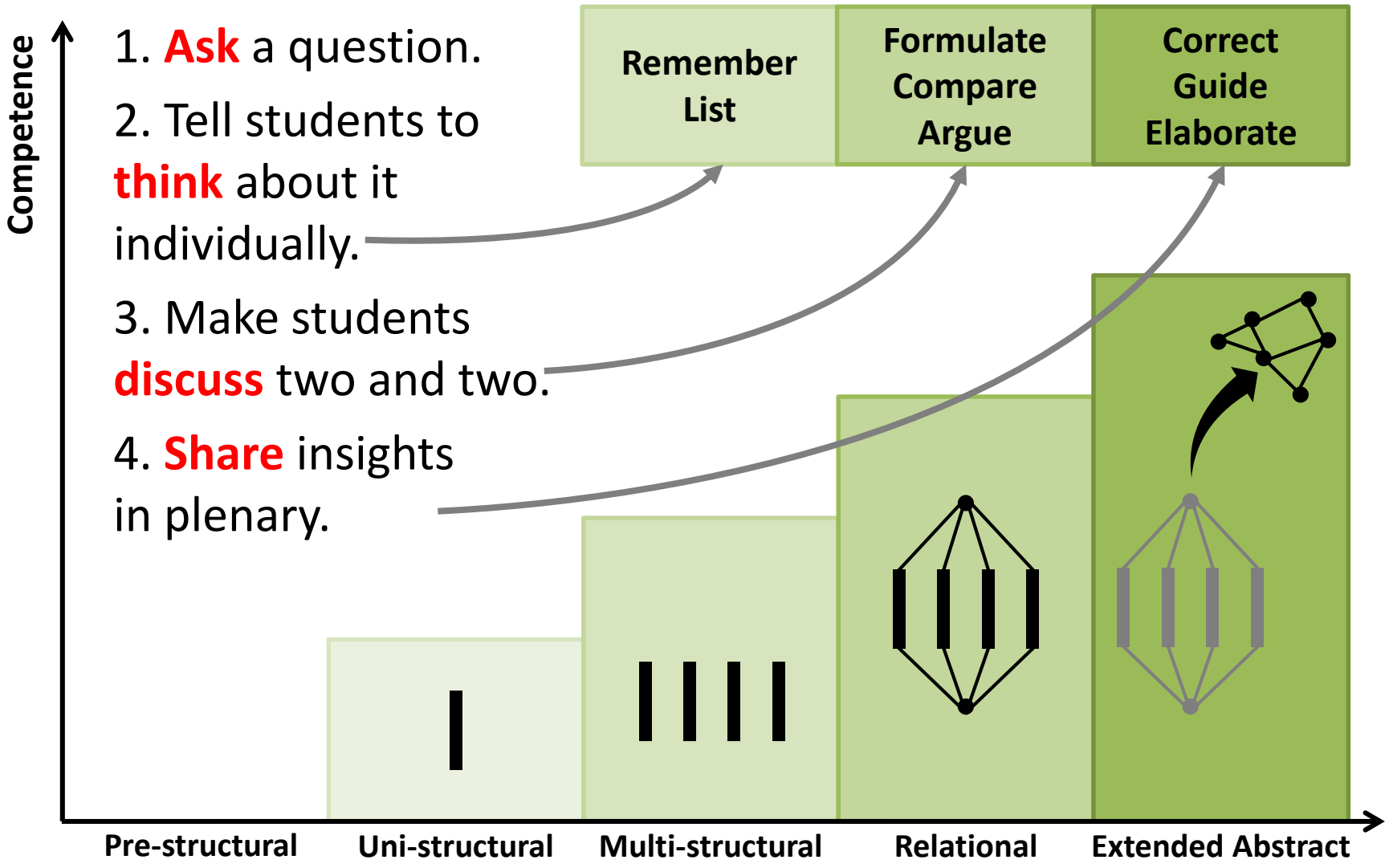
[If you have limited time, read the **short version**: John Biggs. 1999. What the student does: Teaching for enhanced learning. *Higher Education Research & Development* **18**:57-75.]

Biggs SOLO taxonomy

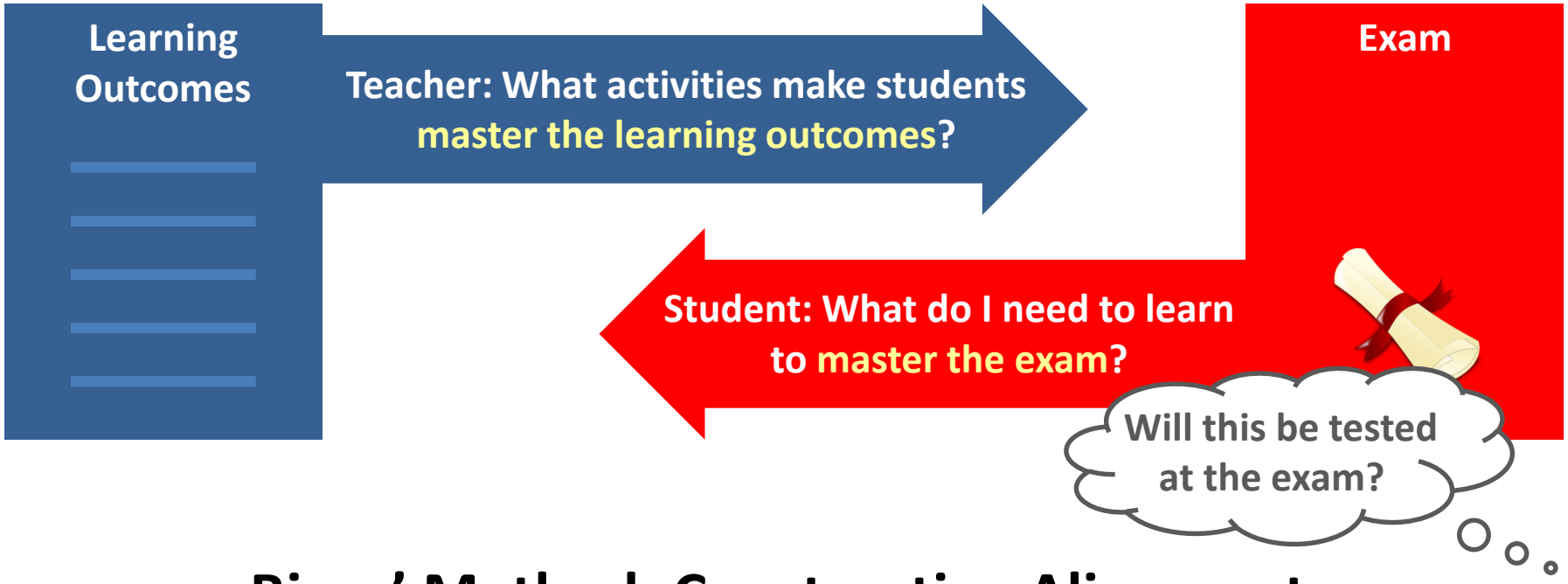



Competence
How to equip students with deeper understanding?
Higher education
Wikipedia
Remember
Recognize
Do simple procedure
Describe
Combine
List
Execute in sequence
Analyse
Apply
Discuss
Explain causes
Criticize
Compare
Generate
Hypothesize
Reflect
Create
Theorize
Pre-structural
Uni-structural
Multi-structural
Relational
Extended Abstract

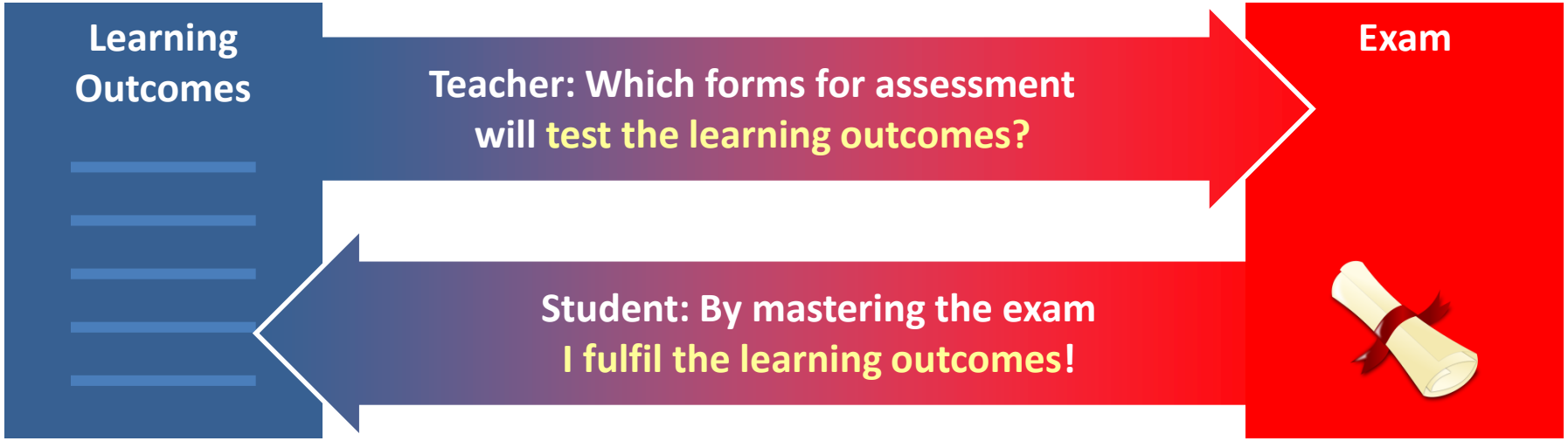
Think, pair, share




Active
teaching
Digital
tools



Biggs' Method: Constructive Alignment



John Biggs

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«Blame the student».

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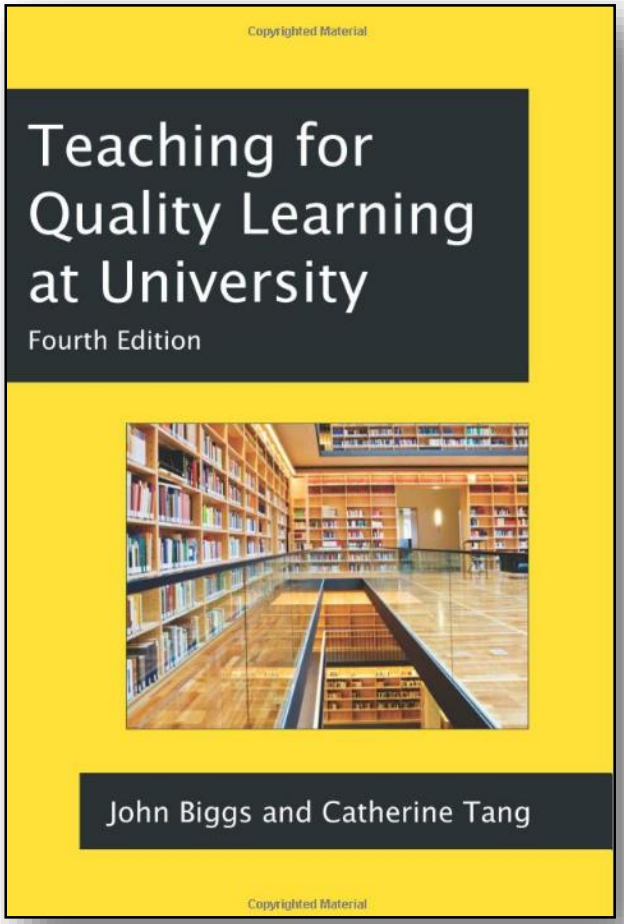
Many Norwegian institutions are here?

Level 3. What the **student does**.



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http://www.bwbr.com/portfolio/a-glenn-hill-center-for-stem-education/

North Dakota State University

«Entertainer»	«Researcher»
Sensing	Abstraction
Feelings	Analysis
Processes	Results
Extroversion	Introversion

«Entertainer»

An impossible ideal…

«Researcher»

Concrete tricks with desirable effects.

«Researcher»

Turn rationality ON!

Concrete tricks with desirable effects.

Focus on content, not the lecturer.