The lecturer who dislikes lecturing

Christian Jørgensen

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### Myers-Briggs personality types

<table>
<thead>
<tr>
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The table above summarizes the key aspects of the Myers-Briggs personality types framework.
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1-2%
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.
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!

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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

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

Wikipedia

- Remember
- Recognize
- Do simple procedure

- Describe
- Combine
- List
- Execute in sequence

Higher education

- Analyse
- Apply
- Discuss
- Explain causes
- Criticize
- Compare
- Generate
- Hypothesize
- Reflect
- Create
- Theorize

Pre-structural
Uni-structural
Multi-structural
Relational
Extended Abstract
Think, pair, share

1. **Ask** a question.
2. Tell students to **think** about it individually.
3. Make students **discuss** two and two.
4. **Share** insights in plenary.
Teacher: What activities make students master the learning outcomes?

Student: What do I need to learn to master the exam?

Will this be tested at the exam?

Biggs’ Method: Constructive Alignment

Teacher: Which forms for assessment will test the learning outcomes?

Student: By mastering the exam I fulfil the learning outcomes!
John Biggs

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«Entertainer»

An impossible ideal...

«Researcher»

Concrete tricks with desirable effects.
Concrete tricks with desirable effects.

Focus on content, not the lecturer.

Turn rationality ON!