Uncovering the science of the classroom: what works and why?

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*** post-presentation version, includes participants' responses ***

Introduction!

- What is one classroom practice or teaching strategy you've used that worked well?

Starting off with something that will catch their attention anything shocking might so the trick..

Discussion

I used somerhing called "expert and home group"

Ask a question, provide thinking time then pair and share

Read texts out loud

Bell ringers. Allows the teacher to monitor who still struggles and with what.

I use a lab experiment in science class as a foundation for a subject.

Thin-sliced problems

Being happy and warm to the students is by far the most effective way to start them learning

Visualization as a technique for teaching

literature

Collaborative learning

Förklara saker!

Peer response

Relationships and discussions

Projects that involve both analog and digital media.

Interactive games on the Smartboard

Laborationer där eleverna får göra saker.

Student led tutorial sessions

Collaborative teaching and learning.

STEM/STEAM Project-based learning

Think - Pair - Chair

Hands on

Dialogue

Game based on learning

My students did a math exam in pairs

game based learning

Consistency in the routines.

Clear instructions

Experiments

Cooperative learning

Flip classroom

Quick Digital Quiz

Delivering verbal instructions from behind the students whilst they have the task on the board in front of them

Telling a story

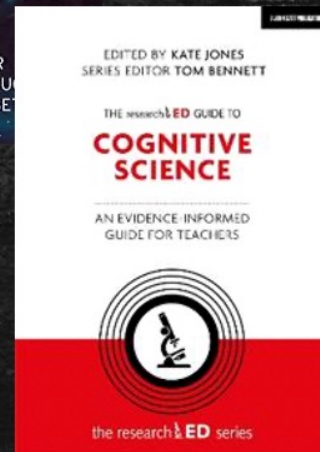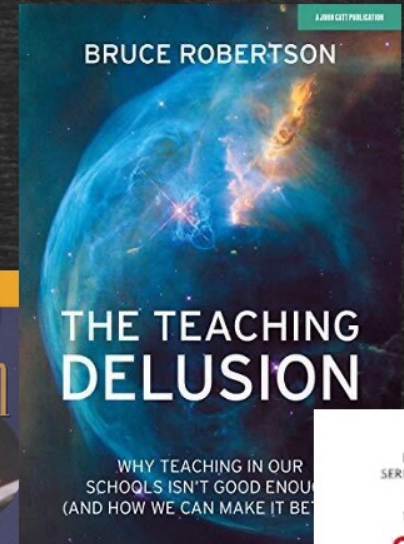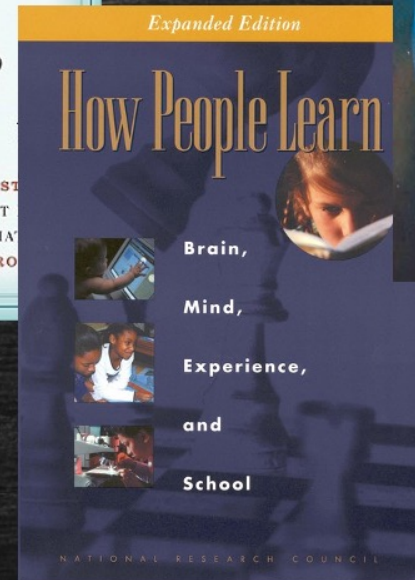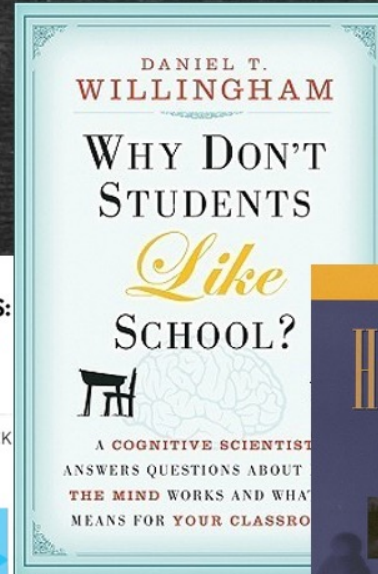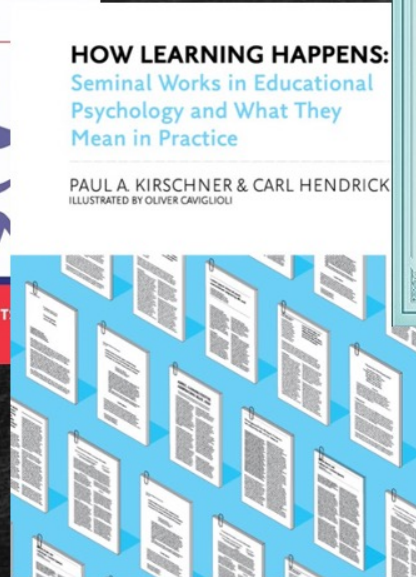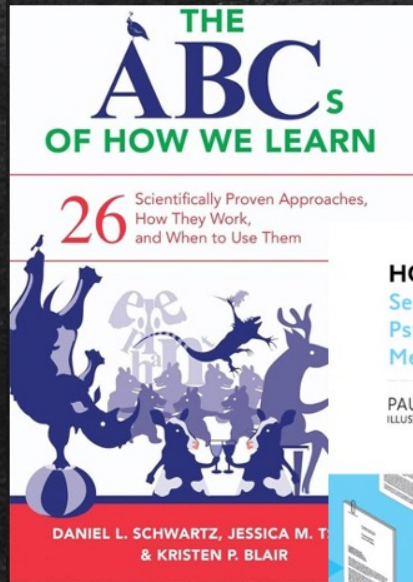→ Do you know why it worked?

Learning science

experience

↓

theory

↓

application

…and many others

True or false?

1. "Students have distinct learning styles that should be catered to in order to improve learning outcomes."

2. "Students learn best when they discover things by themselves."

3. "Testing improves learning."

4. "Classroom instruction should be differentiated to meet different goals and keep students' engagement during a lesson."

5. "Rereading notes or textbooks and underlining key points is one of the best ways to study."

6. "Providing immediate feedback after a task helps students learn more effectively."

7. "Students learn better in an environment of multiple information sources, including digital devices, by which they guide their own learning."

True or false?

WHY?

1. "Students have distinct learning styles that should be catered to in order to improve learning outcomes."

   ➢ preference ≠ ability

2. "Students learn best when they discover things by themselves."

   ➢ understanding requires knowledge

3. "Testing improves learning."

   ➢ identifies gaps, aids retention

4. "Classroom instruction should be differentiated to meet different goals and keep students' engagement during a lesson."

   ➢ social engagement ≠ cognitive engagement

5. "Rereading notes or textbooks and ~~underlining key points~~ is one of the best ways to study."

   ➢ familiarity ≠ learning

6. "Providing immediate feedback after a task helps students learn more effectively."

   ➢ corrects misconceptions before they are reinforced

7. "Students learn better in an environment of multiple information sources, including digital devices, by which they guide their own learning."

   ➢ "multitasking" is IMPOSSIBLE

Practice: Real-world scenarios

Scenario 1: Engaging a Distracted Class

▪ You notice that students are easily distracted during your lessons, often looking at their phones, chatting with each other, or appearing disengaged. *You want to implement strategies that will help regain their attention and increase engagement.*

Scenario 2: Students don't remember! Improving Long-Term Retention

▪ Your students perform well on tests immediately after a lesson but struggle to remember the material over longer periods. *You want to implement strategies that promote long-term retention of key concepts.*

Scenario 3: Managing Diverse Learning Needs

▪ You have a classroom with students who have varying levels of prior knowledge and learning abilities. Some students grasp concepts quickly, while others struggle. *You want to ensure that all students can learn effectively without leaving anyone behind.*

Scenario 4: Supporting Early Literacy

▪ You are teaching a group of young students with diverse reading abilities. Some students are reading at grade level, while others are struggling to recognize letters or decode basic words. *You want to implement strategies that can support the development of literacy skills for all students, including those who are behind.*

Participants' responses

Scenario 1 responses

Discussion

They should hand in their phones before class.

Start discussing

Take the phone, give an individual task for each student, give them a test/quizz, teach them how to self regulate, small group activities

Scenario 2 responses

Repeat once more

Spaced and interleaved practice

Homework, test, step by step from esier to harder

Dual-coding (engage senses)

Scenario 3 responses

Difference approach

Scenario 4 responses

Reading

Phonics

Key concepts revisited

- Cognitive architecture
  - cognitive load
  - STM (WM) vs LTM: encode – store – recall
  - dual coding
  - schemas
  - chunking

- Retrieval practice (Testing effect)
- Spaced and interleaved practice

- FEEDBACK

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Final take-aways
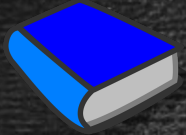
1. Does *science* support my teaching strategy?

2. Do students make relevant *cognitive efforts*?

3. Is the *social environment* of my classroom conducive to learning?

*"We are more **alike** than we are different, in terms of **how we think and learn.**"*