Evidence-Based Teaching in Higher Education: Strategies to Improve Student Learning

Presented by:
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A Conversation Between

Maryellen Weimer
and
Victor Benassi

What is the science of learning?

"the scientific study of how people learn" (p. 3)


The work's being done in labs and labs aren't like classrooms!
But that’s changing. What’s being done in the academic setting confirms the power of the science of learning.


Can the science of learning make teaching more evidence-based?

The answer is a resounding yes!

Further support of Victor’s answer:


Two science of learning concepts

Desirable difficulties

Techniques for learning from texts

One science of learning theory

Cognitive Load


Desirable difficulties
(named and defined by Robert Bjork)

A desirable difficulty describes a situation which makes something harder to learn initially but makes it easier to recall and apply at a later time.

You’ll find a link to a video of Bjork discussing the desirable difficulties concept in the supplementary materials.

Two questions about errors:

Should teachers try to avoid them at all costs?

What if students explain things incorrectly to each other?

When students give inaccurate explanations... 

The critical factor is whether the erroneous explanations are corrected and not just with correct information, but with an explanation.
Three examples of desirable difficulties

Spacing study
Interleaving
Testing, as in retrieval practice

Testing, as in retrieval practice

Students can test themselves by answering a question, doing problems or by generating their own questions that they then answer.
Research highlights from the work of Roediger and from Benassi and Overson

"Potent Techniques for Learning" chapter by Khugen Nguyen and Mark McDaniel in Applying the Science of Learning in Education

What about notetaking when reading texts? Can be helpful, but not always.

What about highlighting? Rarely found to be effective.
To help students develop college level reading skills consider **Read, Recite, Review (3R)** Relatively low cost in terms of student effort.

**Benefits of adjunct questions for skilled and less skilled readers**

![Graph showing the benefits of adjunct questions for Lower SAT-Critical Reading Students](image)

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Cognitive load – Two definitions

“the demand for working memory resources of a particular learner by specific tasks or activities” (offered by Lee and Kalyuga)

“the amount of concentration required by a task” (offered by Chew)
Working memory is limited

Three kinds of processing “fill up” working memory
  Essential
  Extraneous
  Generative

Cognitive load theory and the amount of content in courses: any relationship?

How can teachers figure out how much effort a learning task requires?
Some suggestions

What we know about desirable difficulties and the range of proximal learning
The “worked solutions” literature
From cognitive load theory

What’s needed to get more teachers implementing discoveries like these?

Tell us what you think
https://www.surveymonkey.com/r/mos120115/

Thank you!