The Learning Styles Hypothesis: Does Aligning Instructional Methods with Students’ Preferred Learning Styles Lead to Better Learning?

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Learning Styles

Described

Learning styles and *Learning*
People can be classified according to their learning style. Individuals have differences in how they learn.
Statement

It is important to me that I consider individual differences in my students’ learning of course material.
Question

I want to teach you something.
How would you report your preferred method of learning?

A. Visual
B. Auditory/musical
C. Read/write
D. Kinesthetic
Complete VARK

Visual
Aural (auditory)
Read/write
Kinesthetic

Initially developed Neil Fleming, Christchurch, New Zealand, 1987
http://vark-learn.com/introduction-to-vark/
Learning Styles

- Visual
- Auditory/Musical
- Read/Write
- Kinesthetic/Physical
- Social
- Solitary
- Logical/Mathematical
Learning Styles “Meshing” Hypothesis

Students have different modes of learning

Learning can be improved if the mode of instruction matches the preferred mode of learning, independent of content
Exercises

Learning Objectives
Great Expectations

How Dickens builds, sustains, and resolves suspense
The Neuron

How a neuron transmits messages
The Meshing/Matching Learning Styles Hypothesis

“the idea that instruction should be provided in the mode that matches the learner’s style. . . We refer to this specific instance of the learning-styles hypothesis as the meshing hypothesis . . .” (Pashler et al., Psych. Sci. Pub. Int. 2009, p. 108)
Basic Design to Test the Meshing Hypothesis

• Assess Student’s Learning Style (e.g., create clear groups of visual and auditory learners)
• Create two versions of the same content lesson
• Randomly Assign the visual learners to visual lesson or auditory lesson (half to each condition)
• Randomly Assign the auditory learners to visual lesson or auditory lesson (half to each condition)
• Present the assigned lesson to students
• Assess student learning on the same final ‘test’—use authentic tests, same as teachers would use in a class.
Hypothetical Evidence Supporting Meshing Hypothesis
Hypothetical Evidence Supporting Meshing Hypothesis

- Style: Visual
- Method: Visual
- Method: Auditory

Graph showing the relationship between style and method.
Hypothetical Evidence Not Supporting Meshing Hypothesis

![Graph showing the relationship between style and evidence not supporting meshing. The graph has two lines: one for Method: Visual and one for Method: Auditory. The x-axis represents 'Style: Visual' and 'Style: Auditory,' and the y-axis ranges from 0 to 100.}]
Hypothetical Evidence Not Supporting Meshing Hypothesis
Students report preferences about how they learn

Learning should improve by matching the instructional mode to the learner’s preference
Students report preferences about how they learn. But empirical evidence shows that people who have a preferred instructional method don’t perform better on the task if the instructional method matches their preferred instructional style.
What do Results of Tests of Meshing Hypothesis Show?

• Learning Styles: Concepts and Evidence
• Harold Pashler, Mark McDaniel, Doug Rohrer, and Robert Bjork
• https://www.psychologicalscience.org/journals/pspi/PSPI_9_3.pdf
Abstract

“The term ‘learning styles’ refers to the concept that individuals differ in regard to what mode of instruction or study is most effective for them. Proponents of learning-style assessment contend that optimal instruction requires diagnosing individuals’ learning style and tailoring instruction accordingly.”

“...credible validation of learning-styles-based instruction requires robust documentation of a very particular type of experimental finding with several necessary criteria” [as I described previously].
"We conclude therefore, that at present, there is no adequate evidence base to justify incorporating learning-styles assessments into general educational practice."

"However, given the lack of methodologically sound studies of learning styles, it would be an error to conclude that all possible versions of learning styles have been tested and found wanting; many have simply not been tested at all. “
Recent Review of Meshing Hypothesis

• Is learning styles-based instruction effective? A comprehensive analysis of recent research on learning styles

• Joshua Cuevas


“Results revealed that the more methodologically sound studies have tended to refute the hypothesis.”

“. . . learning styles instruction enjoying broad acceptance in practice, but the majority of research evidence suggesting that it has no benefit to student learning, deepening questions about its validity” (p. 308).
https://www.youtube.com/watch?v=slv9rz2NTUk
Why the Learning Styles Myth Persists

• Widespread acceptance
• Some truths
• Confirmation bias
Truths

Learners *are* different from one another. Students vary in their:

- general ability to learn
- ability to learn particular content
- interests
- background knowledge
Incorporate Teaching Strategies Demonstrated to Benefit Learning

• Determine Background (e.g., Prior Knowledge, Reading Skill, Interests)

• Application of cognitively-based learning strategies
  • Retrieval Practice (Test Enhanced Learning)
  • Elaboration and Self Explanation
  • Transfer Appropriate Training
  • Distributed Practice and Interleaving of Practice
  • Multimedia Principle
  • Plus many others
Example of Individual Differences

The diagram illustrates the mean exam performance across different SAT performance levels (Low, Medium, High) for original and modified slides. Error bars at 95% CI are shown to indicate variability.
Exercises

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References

• The Myth of Learning Styles
  • Reiner & Willingham: