

**PINPOINT**

The goal of your instructional program is to free limited working memory from irrelevant mental effort and harness it for the work required to integrate new knowledge and skills.

Ruth Colvin Clark

What is a cognitive load?

Cognitive load is also known as information overload which accurately defines it. Such a surfeit of either the content or complexity of information erodes the quality of learning. This phenomenon is proven by research to be universal.

The magic number 7

George Miller's 1956 article arrived at the number 7 (+ or - 2) as the most number of chunks of information we can handle at any one time. His study was on short-term memory. Or more usefully known as **working memory**. More recently, others have found 4 chunks to be a more realistic measure.

Chunks of information

Chunks are another term for groupings of smaller items.

Types of cognitive load

There are three different types of cognitive load.

Intrinsic load is mental work created by content and its goals.

Germane load is mental work created by teaching activities

Extraneous load is mental work created that is irrelevant to the learning goal. This is a waste of limited mental capacity.

Split attention

Undue mental energy is spent when attention is split. This happens when you have to integrate two or more pieces of information that are physically separated. The act of looking in one place and holding that information in your mind as you transfer it to somewhere else erodes learning through this waste of mental energy.



When the learning goal requires a deep understanding, explanatory visuals that show relationships work best.

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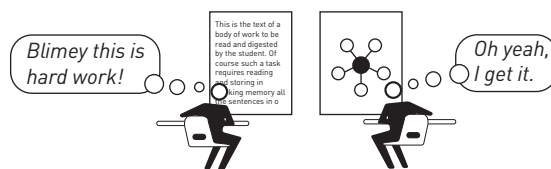


Design learning environments that allow learners to control their own rate of progress.

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The power of visuals over words

In study after study, diagrams prove more effective learning aids than text. Elements of a visual are viewed simultaneously, unlike sentences which must be processed sequentially, one at a time. As a result, students report that text makes work seem more difficult, while visuals make it seem less difficult.



Use more signals

In text

Focus attention and reduce effort by using concise writing where every word in a sentence counts. And every sentence counts. Point to important words with bold text, boxes,

numbers, bullet points and headings. Use short paragraphs and summaries.

In visuals

Direct attention with arrows, dashed lines and call outs.

Less is better

Ruthlessly cut out extraneous material. Not only is it not needed, it actually depresses learning. Especially true for the mistaken belief of using many learning styles simultaneously.

Types of visuals

Not all visuals are equal. Of little value—and often detrimental—are **decorative** visuals, mainly in the form of clip art. Better are **representational** visuals.

Worked examples

While learning needs plenty of practice, using worked examples can speed up the learning process. Worked examples are step-by-step demonstrations of how to perform a task properly.

Edutainment

Adding motivational material that is not directly relevant to the lesson does not work. There is repeated evidence that it depresses learning. Just slice, dice and serve the essentials.

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