



## COGNITIVE LOAD THEORY 2.0

Cognitive Load Theory proposes humans have a limited, short term working memory but an unlimited long term memory. The retention and connection of information in the long term memory transforms our ability to function.

Cognitive Load Theory is most applicable when information is new to pupils, complex and they are at a novice stage in their learning. When this is less true the theory is less applicable as the limits of working memory are unlikely to be reached.

# IMPLICATIONS FOR TEACHING & COURSE DESIGN

### EXPERTISE REVERSAL

As multiple interacting elements of knowledge become organised and linked together, as a pupil's learning increases, the positive effects of instruction designed for novices disappear or even reverse.

#### Worked Example Effect

Provide pupils with a fully worked through solution they can study

#### Completion Problem Effect

Partial solutions to a problem are provided with pupils required to complete the missing stages

#### Goal Free Effect

Provide pupils with open ended problems rather than those with a specific end point

#### Isolated Elements Effect

Present the elements of information/tasks individually first

#### Variability Effect

Replace a series of similar problems with ones that differ from each other; pupils identify similarities and differences

#### Collective Working Memory Effect

Collaborative tasks increase the cognitive resources available to solve complex problems

#### Self Explanation Effect

Supports the studying of worked examples; pupils use provided prompts to explain the approach/thinking in the solution

#### Self Management Effect

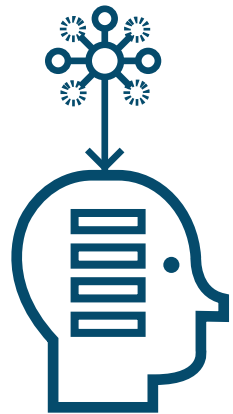
Pupils are explicitly taught how to design materials to study, in line with cognitive load theory.

#### Imagination Effect

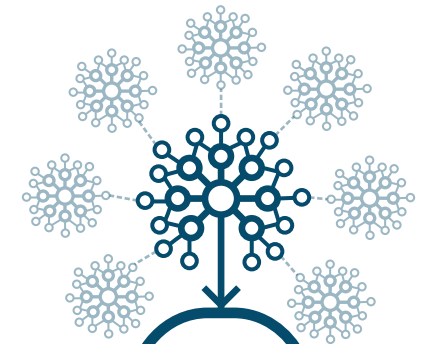
Pupils mentally practise the concept or procedure; pupils need a secure prior knowledge of the concept or procedure

### GUIDANCE FADING EFFECT

Over the course of an extended programme pupils' become more expert; information and activities that are effective for novices become a distraction and place unnecessary extraneous cognitive load on more expert learners.



NOVICE



EXPERT

Reference:

Sweller, J., van Merriënboer, J. and Paas, F. (2019). **Cognitive Architecture and Instructional Design: 20 Years Later.** Educational Psychology Review.