

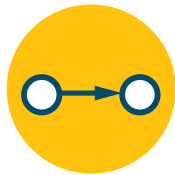


COGNITIVE LOAD THEORY 2.0

There are three types of cognitive load. Intrinsic cognitive load is affected by the complexity of the information (element interactivity) and expertise of the learner. The more complex the information and the more novice the learner the greater the cognitive load. Germane cognitive load constitutes the processing capacity within working memory to aid learning.

Intrinsic load and germane cognitive load are intertwined and work to aid learning. Extraneous cognitive load is associated with teaching and how materials are presented. Where the teaching or course design lacks clarity or precision the extraneous cognitive load is increased. This redirects the processing capacity in working memory – germane cognitive load – away from learning.

IMPLICATIONS FOR TEACHERS: SCAFFOLDING LEARNING



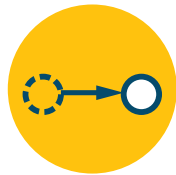
Worked Example Effect

Worked examples provide a full solution to a problem. This focuses the learners' attention on the steps required to solve it, enabling them to induce generalised solutions.



Self-Explanation Effect

Effective when used alongside worked examples. Learners respond to prompts that require them to explain the process and workings used to solve the problem. It ensures learners carefully study the worked example.



Completion Problem Effect

Partially completed problems are provided to learners who are required to complete them; the amount of work required by the learner can be varied. This forms a bridge between worked examples and conventional problems.



Goal-Free Effect

Goal free problems lower cognitive load and increase the focus on finding solutions by removing the cognitive load associated with holding and processing: a current problem state, a goal state and problem-solving operators.



Variability Effect

Studying variable questions/problems increases intrinsic cognitive load. However, learners gain domain knowledge of similarities and differences; this approach enhances the germane element of cognitive load leading to greater learning.



Imagination Effect

The imagination effect occurs when learners imagine or mentally rehearse a concept or process. This is only appropriate once learners have secure prior knowledge; if not working memory will be exceeded.



Collective Working Memory Effect

When learners collaborate on a complex task or problem their multiple limited working memories (and information stored in long term memory) are pooled to form a single information storage and processing system.