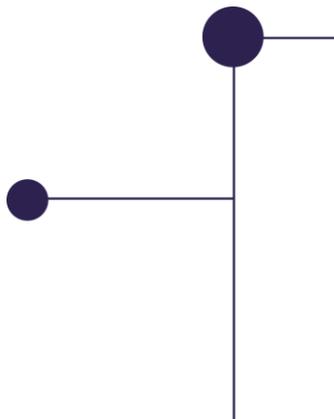# Cognitive Load Theory

and its applications in instructional design

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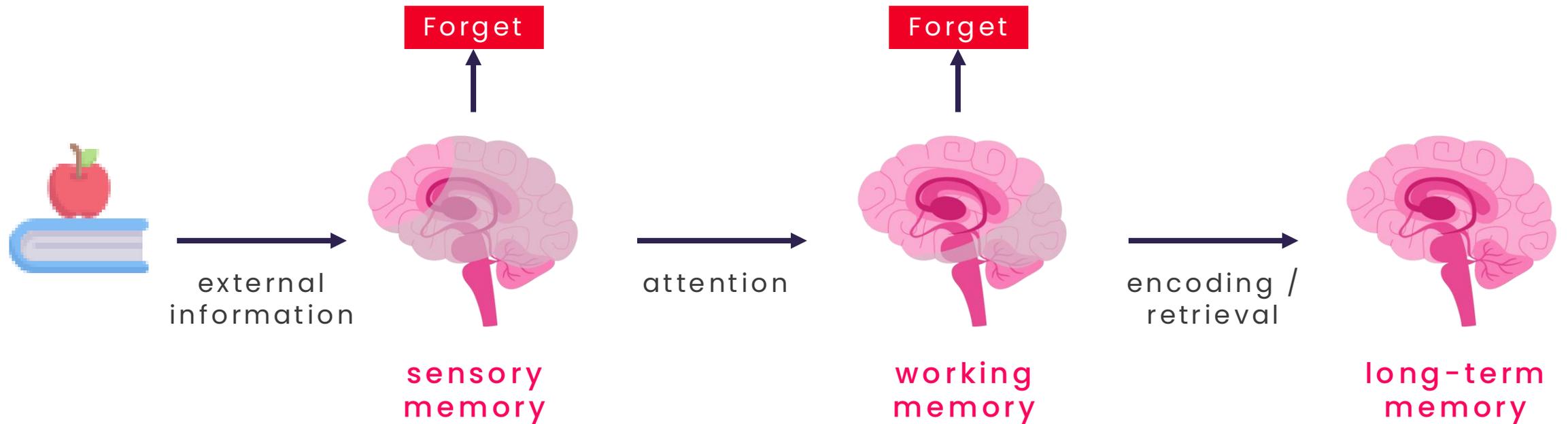# **Content**

01.
Human Cognitive Architecture

Atkinson and Shiffrin's

Information Processing Model

Forget

Forget

external
information

attention

encoding /
retrieval

**sensory
memory**

**working
memory**

**long-term
memory**

About

Schema Theory

Schemas

Categories of information stored in long-term memory that contain groups of linked memories, concepts or words.

Functions

- Organising the storage of knowledge.
- Reducing working memory load.

02.
Cognitive Load Theory

and related theories

The definition of
Cognitive Load Theory

About CLT

A psychological theory that attempts to enhance learning outcomes by taking into consideration the capabilities and limitations of the **human cognitive architecture**.

Constructs

The main psychological constructs of interest in CLT are **cognitive load and learning**.

What is

Cognitive Load

Cognitive Load

The amount of information our working memory can process at any given time.

Types of Cognitive Load

- Intrinsic load,
- Extraneous load,
- Germane load.

Categories of

Cognitive Load

Intrinsic Load

The inherent level of difficulty associated with a specific instructional topic.

Extraneous Load

The manner in which information is presented to learners and is <u>under the control of instructional designers.</u>

Germane Load

The components that help the processing of information and contribute to the long-lasting construction of schemas.

03.
ID Principles & Models

derived from CLT

Implications of
Cognitive Load Theory

Manage

Intrinsic Load

Minimize

Extraneous Load

Maximize

Germane Load

Instructional Design Principles

Derived from CLT

Worked Examples

Reduces intrinsic load and supports schema formation.

Modality

Dual-processing capacity of working memory.

Segmenting

Manages intrinsic load and Matches attention span limits and working memory capacity.

Practical Applications of CLT

In Instructional Design

Microlearning

Microlearning training units that last around five minutes each reduce cognitive load.
Segmenting helps reduce intrinsic load.

Learning Interface Design

(LxD) is how information is visually organized and presented on a screen. This includes clean layouts, consistent icons, meaningful color use, and intuitive navigation.

Practical Applications of CLT

In Instructional Design

Multimedia Content & Materials

Multimedia materials such as text, visuals, narration, and animation help learners process information more efficiently. The goal is to use different channels of working memory without overloading either one.

Classroom Teaching Practices

Design and deliver lessons that match how the brain processes information. The focus is on reducing unnecessary mental effort and supporting meaningful learning.

Thank You.

Resources

Cognitive Load Theory
Jan L. Plass, Roxana Moreno, & Roland Brünken. (2010). *Cognitive Load Theory*. Cambridge University Press.

Cognitive Science
Sweller, J. (1988). Cognitive load during problem solving: Effects on learning. *Cognitive Science, 12*(2), 257–285. https://doi.org/10.1207/s15516709cog1202_4

Cognitive load theory as an aid for instructional design
Cooper, G. (1990). Cognitive load theory as an aid for instructional design. *Australasian Journal of Educational Technology, 6*(2). https://doi.org/10.14742/ajet.2322

Cognitive Load Theory and Instructional Design: Recent Developments
Paas, F., Renkl, A., & Sweller, J. (2003). Cognitive Load Theory and instructional Design: recent developments. *Educational Psychologist, 38*(1), 1–4. https://doi.org/10.1207/s15326985ep3801_1

An introduction to cognitive load theory
Howley-Rouse, A. (2024, August 23). *An introduction to cognitive load theory*. THE EDUCATION HUB. https://theeducationhub.org.nz/an-introduction-to-cognitive-load-theory/