

# Intrinsic Cognitive Load

## Theory

**Intrinsic cognitive load** is the result of inherent complexity of the information which needs to be processed. For example, when translating a number of words intrinsic cognitive load is quite small, but when translating same number of words forming part of a sentence intrinsic cognitive load is higher since not only meanings of individual words, but also their relations must be analyzed.

Still, it should be noted that there is **no objective measure** of element interactivity, since what exactly will be considered as an *element* depends on learners existing schemata and how developed and automatized they are. Unlike a novice, an experienced learner with an appropriate schema will be able to manipulate multiple elements and their relationships as one and will therefore experience reduced element complexity and intrinsic load.<sup>1)</sup>

## Practice

Earlier it was considered that intrinsic cognitive load

- “cannot be manipulated through instructional design without changing nature of the task or compromising understanding.”<sup>2)</sup>

Still, recent findings suggest it is possible to reduce intrinsic cognitive load using techniques like

- **simple-to-complex** sequencing<sup>3)</sup>,
- **modular presentation** of solution procedures<sup>4)</sup>, or
- simplified whole tasks<sup>5)</sup>

<sup>1)</sup>

Ginns, Paul. Meta-analysis of the modality effect. *Learning and Instruction* 15, no. 4: 313-331. August 2005.

<sup>2)</sup>

Ayres, P. Impact of reducing intrinsic cognitive load on learning in a mathematical domain. *Applied Cognitive Psychology*, 20(3), 287-298. 2006.

<sup>3)</sup>

van Merriënboer, Jeroen J. G., Paul A. Kirschner, and Liesbeth Kester. Taking the Load Off a Learner’s Mind: Instructional Design for Complex Learning. *Educational Psychologist* 38, no. 12003: 5. 2003.

<sup>4)</sup> <sup>5)</sup>

Gerjets, Peter, Katharina Scheiter, and Richard Catrambone. Designing Instructional Examples to Reduce Intrinsic Cognitive Load: Molar versus Modular Presentation of Solution Procedures. *Instructional Science* 32, no. 1/2: 33-58. January 2004.

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