

## Cognitive Load Principles

### Use Cognitive Load to your Advantage

There are three tiers of cognitive load theory. Studies continually illustrate the power of cognitive load management with your teaching materials. As non-traditional student experience often involve multimedia and face-to-face time, understanding the three 'loads' in cognitive load will help you understand where improvements can be made. There is not a single silver bullet but small pinches, tugs, and changes to your approach will make marked differences in student learning.

**Intrinsic Load:** is hard to minimize at times. It has to do with the inherent difficulty of the materials you are asking the students to learn. Think about the number of "elements" or chunks of knowledge you are asking students to simultaneously juggle in their limited working memories. If you have many elements and they interact, the materials will be seen as complex and difficult to understand as the process of making schema in long-term memory is burdened.

More	Less
Use examples, analogies, and stories	Long disciplinary speeches
Breaking concepts into chunks	Chalk-talks, especially
Pauses for knowledge checks	for new learners

**Germane Load:** how much cognitive effort is devoted to constructing and organizing schemas, it is an essential process. Schemas are organization of thoughts and behaviours where learners condense multiple elements of information into single elements. Although this type of load is thought to be immutable, the seasoned teacher in the room might be whispering motivation and developing an attraction for the learner to the materials. In non-tradition designs, like blended learning frameworks, the pre-work empowers students to get a personal handle on some basic knowledge can add to our ability to maximize germane loads.

More	Less
Use of your experience of good practice	Bad pedagogy practice:
Put yourself out on a limb	Shutting down wrong answers or input
Repetition, yes, repetition with purpose	Letting the same person speak too much
Laughter and noise helps	Long soliloquys

**Extraneous Load:** related to how our learning materials are presented and the amount of work students need to do to simply comprehend the way your present your learning materials. This might be the easiest and most common area where we make learning too hard.

More	Less
Get a handle on multimedia load reducing principles (other page)	Falling back to your safe-place
Experiments with new tools, approaches, 'agents' in your teaching	Complicated stuff (visually & verbally)

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### Facilitate Generative Processing

Principle	Application
Multimedia	Present words and images rather than words alone.
Personalization	Use conversational speech rather than formal speech when presenting.
Voice	Present speech with natural human voice rather than a computerized one.
Image	Include speaker's image on the screen.

### Manage Essential Processing

Principle	Application
Segmenting	Present lessons in user-paced segments rather than in one long, continuous unit.
Pre-Training	Start lesson by providing an overview of the critical components to be taught.
Modality	Use images and spoken words rather than images and written words when presenting lesson.

### Minimize Extraneous Processing

Principle	Application
Coherence	Delete extraneous words, sounds or images.
Signaling	Highlight important terms and images.
Redundancy	Remove redundant captions from narrated animation.
Spatial contiguity	Position critical terms next to images.
Temporal contiguity	Present corresponding words and images simultaneously.

Mayer, R. E. (2009) *Multi-Media Learning. Second Edition*. Cambridge University Press.