

Cognitive load: What is it and why should I care?

Transcript

Part I

This video involves a topic called **cognitive load**. I can only scratch the surface of this topic and the learning theories and elements that it involves. That said, I'm still going to try to relay some important points that will hopefully *maximize* your students' learning and *minimize* their frustrations as you present new information to them.

There are 3 types of cognitive load:

- **Intrinsic**
- **Extraneous**
- **Germane**

Intrinsic cognitive load has to do with the complexities of the particular topic that's being learned and a learner's ability to understand that new information. In this case, we want to try to **simplify** the explanations of what we're presenting as much as possible and/or break up the complex task into smaller, simpler parts.

Extraneous cognitive load can be attributed to the **design** and **presentation** of the instructional materials. Here is where icons or graphics that are merely used to decorate the slide or page can get in the way. Or if you are playing some background music that doesn't fit in when you are trying to teach someone something. Or using too many font styles or colors. Such design elements can be highly distracting. We want to significantly reduce the amount of extraneous load in order to free up working memory.

Germane cognitive load is the processing, construction and automation of **schemas** – or mental connections. Schemas are like the cognitive structures and conceptualizations that make up our knowledge bases. They inform what we can expect when we encounter that particular idea or object in the future. And they give us mental hooks on which to hang our cognitive hats upon. We want to maximize what goes on in this area! Bottom line: This is the good stuff!

The topic of cognitive load involves the topic of a learning theory called the “**information processing theory**.”

For many people, it's helpful to think of the information processing theory like what happens inside a **personal computer** – so we'll put that into this graphic.

Let's walk through the model.

First of all, we see, hear, read, and watch things that get put into our working memory...also called our short-term memory. In terms of a computer, this is where the term RAM -- or Random Access Memory (or RAM) -- comes in. That is, it's very temporary and has its limits.

Ideally, the goal here is to move information out of RAM or working memory and onto the hard drive -- or long-term memory -- so that we can retrieve and apply that information later on.

Part II

Ok, that's nice. But so what? What does this topic have to do with my teaching?

Well, let's take a look at that.

And we're going to use the idea that in the information processing model, information can come into our working memories via an auditory channel as well as via a visual channel. We want to be aware of the loads being placed on these two channels as we teach our students.

So, let's take a look at some different presentations and the cognitive loads that we experience when we watch them and try to learn from them.

I'll be putting some information on the left side of the screen, while tracking the demands being placed on the auditory and visual channels on the right side of the screen. We'll see that the amount/type/pacing of information presented on the left impacts what happens on the right.

For our first presentation, let's go back a few years when Steve Jobs introduced the iPhone.

[video]

So in Steve Job's presentation, the cognitive load is very low -- that is, the information coming into our auditory and visual channels is pretty low...and very manageable. There isn't a ton of text on the screen, his pacing is such that we can track what he's saying quite well, and the visuals are clean and are completely aligned with his message. There are no distracting graphics put up on the screen for decorations sake.

So let's contrast that with something else.

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Ok, folks, today we are going to talk about learning objectives. We want complete alignment with what our students need to know in their Bar Exams, and we want that to be aligned with the activities and the assessments that we create for them.

Looking here, here are the various layers of Bloom's taxonomy. You can see that Bloom's taxonomy can be very helpful when writing learning objectives.

We have remembering and understanding at the bottom of the stack, moving up to applying, analyzing, and evaluating and creating.

Now check out some of the verbs that you see here such as classify, break down, discuss, interpret, relate, defend, discuss, and more.

Conclusion:

Whew! Enough already!!!

While this is clearly an exaggeration, it's mean to be so. You were likely a bit confused as to where to look at times. Or perhaps you were distracted by some motion going on or a distracting decorative graphic...or having me jump around on verbs that represented different layers of the taxonomy.

The thing is, check out your PowerPoint slides. How much text is on them? Are you speaking while students are trying to read all of that text? That's a major strain on folks' auditory and visual channels.

That's the point I'm trying to make here, and hopefully did.

But when I was teaching a class on foundations of information technology, I sometimes put a lot of text on the slide to help me remember what I wanted to tell them...or that I wanted to be sure that they saw.

But I really probably should have had 2 versions of each PowerPoint – one for presenting that was light on text, and a second one that I could post to the LMS for students to get all of the information that I wanted them to see. They can control the pacing of the content that way.

Well, that's enough for now! Thanks for your time.