Questions to ask:

Does it matter whether the words in your multimedia presentation are represented as printed text (that is, as on-screen text) or as spoken text (that is, as narration)?

Do students learn more deeply from graphics with speech (for example, narrated animation) than from graphics with on-screen text (for example, animation with on-screen text blocks), as suggested by cognitive theory?

Does the modality principle mean you should never use printed text?

Why does audio work better for less skilled learner development over more skilled learner development? (p 127)

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Figure 6.5. Overloading of Visual Channel with Presentation of Written Text and Graphics.

Adapted from Mayer, 2001a.

When learners are given concurrent graphics and on-screen text, both must be initially processed in the visual/pictorial channel. The capacity of each channel is limited, so the graphics and their explanatory on-screen text must compete for the same limited visual attention. When the eyes are engaged with onscreen text, they cannot simultaneously be looking at the graphics; when the eyes are engaged with the graphics, they cannot be looking at the on-screen text. Thus, even though the information is presented, learners may not be able to adequately attend to all of it because their visual channels become overloaded.
Figure 6.6 shows how graphics and speech can distribute the processing between the visual and auditory channels. This analysis also explains why the case for presenting words as speech only applies to situations in which words and pictures are presented simultaneously.

Consistent with cognitive theory, recent eye-tracking studies found that students who viewed animation with narration on lightning formation spent more time looking at the graphics than did students who received animations with on-screen text (Schmidt-Weigand, Kohnert, & Glowalla, 2010a, 2010b). When graphics were described by on-screen text, students were largely guided by the text so processing of the graphics suffered.

**What We Don’t Know About Modality**

Overall, our goal in applying the modality principle is to reduce the cognitive load in the learner’s visual/pictorial channel (that is, through the eyes) by off-loading some of the cognitive processing onto the auditory/verbal channel (that is, through the ears). Some unresolved issues concern:

1. When is it helpful to put printed words on the screen with a concurrent graphic?
2. Is it helpful to put concise summaries or labels for key components on the screen as printed words?
3. When it is not feasible to provide audio, how can we eliminate any negative effects of on-screen text?
4. Do the negative effects of on-screen text decline over the course of long-term training?
Suggested Readings


Added readings:

