

Teach the Subject, Not the Child

There is no research basis for catering to students' modalities (visual, auditory, etc.)

By Daniel T. Willingham

QUESTION: What does cognitive science tell us about the existence of visual, auditory, and kinesthetic learners and the best way to teach them?

The idea that people may differ in their ability to learn new material depending on its modality — that is, whether the child hears it, sees it, or touches it — has been tested for over 100 years. And the idea that these differences might prove useful in the classroom has been around for at least 40 years.

Cognitive science has taught us is that children do differ in their abilities with different modalities, but teaching the child in his best modality doesn't affect his educational achievement.

What does matter is whether the child is taught in the content's best modality. All students learn more when content drives the choice of modality. Let's review a few things that cognitive scientists know.

1. Some memories are stored as visual and auditory representations, but most memories are stored in terms of meaning.

An important finding from the research is that memory is usually stored independent of *any* modality. You typically store memories in terms of meaning — not in terms of whether you saw, heard, or physically interacted with the information.

For example, you may have learned that a fire requires oxygen by a visual process (watching a flame go out under a glass) or auditory (hearing an explanation), but the resulting representation of that knowledge in your mind is neither visual nor auditory.

How did cognitive scientists figure this out? An important clue is the types of errors people make on memory tests. People who listen to a story will later confidently “recognize” sentences that never appeared in the story — so long as these new sentences are consistent with the story's meaning.

2. The different visual, auditory, and meaning-based representations in our minds cannot serve as substitutes for one another.

Our minds have these different types of representations for a reason: Different representations are more or less effective for storing different types of information.

Visual representations, for example, are poor for storing meaning because they are often consistent with more than one interpretation. A static image of a car driving on a snowy hill could just as well depict a car struggling up the hill or slipping backwards down the hill. And some concepts do not lend themselves well to pictures: How would one depict “genius” or “democracy” in a picture?

Because these different memory representations store different types of information, you usually cannot use one to substitute for another.

3. Children probably do differ in how good their visual and auditory memories are, but in most situations, it makes little difference in the classroom.

We've said that some memories are stored visually, some auditory, and some (most) in terms of meaning. And it's likely that some students should have a relatively better visual memory or auditory memory. Shouldn't that mean that some students will more easily remember material that is presented in their stronger modality?

It does, but what advantage would this superior memory provide for a student in a classroom? Teachers almost always want students to remember what things mean, not what they look like or sound like. For the vast majority of education, vision and audition are usually just vehicles that carry the important information teachers want students to learn. Whether information is presented auditorily or visually, the student must extract and store its meaning.

QUESTION: What does the research say about teaching to a child's strongest modality?

Although it is technically true that the theory hasn't been (and will never be) disproved, we can say that the possible effects of matching instructional modality to a student's modality strength have been extensively studied and have yielded no positive evidence. If there were an effect of any consequence, it is extremely likely that we would know it by now.

Teachers should focus on the content's best modality — not the student's. We have seen that the mind uses different representations to store different types of information and that these representations are poor substitutes for one another.

That indicates that teachers should indeed think about the modality in which they present material, but their goal should be to find the content's best modality, not to search (in vain) for the students' best modality.

If the teacher wants students to learn and remember what something looks like, then the presentation should be visual. For example, if students are to appreciate the appearance of a Mayan pyramid, it would be much more effective to view a picture than to hear a verbal description.

There are other ways in which modality of instruction can influence the effectiveness of a given lesson — but the influence applies to all children. There is no benefit to students in teachers' attempting to find auditory presentations of the Mayan pyramids for students who have good auditory memory. Modality matters in the same way for all students.

(Adapted with permission from “Ask the Cognitive Scientist” in American Educator, Summer 2005, the newsletter of the American Federation of Teachers. Dr. Willingham is professor of cognitive psychology at the University of Virginia.)