

# How to bust educational neuromyths? Emphasise what works

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In a recent [survey](#), The Learning Agency asked teachers' opinions of both disproven educational assertions (*neuromyths*) and evidence-based learning strategies. The online survey reached 203 US respondents, 79% of whom were K-12 teachers in public or private institutions. Support staff (18%) and administrators (3%) also replied.

The survey shows that neuromyths are still prevalent. For example, 77% of the respondents endorsed the common neuromyth that people are either right-brained (creative, emotional, visuo-spatial) or left-brained (logical, analytical, verbal), and that this difference impacts their learning. The truth is that most learning involves interconnections between both hemispheres, although some cognitive processes are lateralised. Most important, individuals do not show a general dominance of one hemisphere over the other.

97% of the respondents also endorsed the neuromyth that teaching is more efficient if pedagogical material is tailored to pupils' "learning styles" (visual, auditory or kinaesthetic). This unanimity is strikingly similar to one reported a few years ago in the [United Kingdom, the Netherlands, Turkey, Greece, China, Switzerland, and Spain](#). Experts warn that the "[learning styles](#)" approach does not improve learning. Yet they underscore the relevance of [combining different formats to represent information](#), an evidence-based strategy called *dual coding*.

Teachers who endorse "learning styles" may actually end up applying dual coding (because they use materials tapping into various modalities), but they also may risk pigeon-holing students according to their supposed learning style and fail to understand the rationale behind dual coding. Indeed, only 38% of the respondents believed that a diagram incorporating text (a dual-coding strategy) would be more effective for learning than a diagram and a text presented separately.

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These examples point out the need to combat neuromyths through better explanations and wider dissemination of evidence-based learning strategies. Neuromyth-busting on its own can be perceived as negative and discouraging. After all, neuromyths are seductive for good reasons: they tend to address teachers' needs. For example, the idea of "learning styles" seems to offer a practical solution to individual differences in the classroom. The myth [echoes teachers' practice](#) and seems relatively logical.

The good news is that many evidence-based learning strategies also are logical and well-grounded

in teachers' practice. For instance, two strategies that the majority of respondents in the Learning Agency survey identified as effective are *elaboration* (linking new information with other information and/or prior knowledge) and *metacognition* (reflecting on one's own understanding and problem-solving strategies).

However, some evidence-based strategies can seem more counterintuitive, such as *interleaving*, a practice in which the teacher mixes up problem types rather than presenting problems of a similar type together (*blocking*). Interleaving may seem confusing, but it can be beneficial in the long-term, yet only 35% of respondents to the Learning Agency survey believed that interleaving was more effective than blocking. This finding indicates a need for better communication about this strategy's underlying mechanisms.

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Neuromyths and evidence-based knowledge in cognitive science coexist in teachers' toolkits because they both originate from the need to understand learning processes and to meet students' needs. How can educators separate the wheat from the chaff? Teachers seek greater understanding from formal university training and conferences as well as from informal peer relationships and school networks. Effective spokespersons in these areas are crucial to make background scientific evidence available. On the web, the EEF Teaching toolkit and the Learning Scientists' website appear to be precious resources.

Researchers, for their part, must further study the cognitive biases underlying neuromyths in order to counteract them with evidence-based research. They also should be able to point out the limitations of and potential misunderstandings related to learning strategies. For example, dual coding might not be efficient if the verbal and visual information are not coherent. Beyond neuromyth-busting, presenting teachers with "what works" can help build trust and confidence between the two communities.

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