
How Cognitive Science Helps Teachers

Educators say research findings are not widely understood

Are our children overscheduled? Should preschool children be taught to read? When does academic challenge become academic pressure?

Cognitive science is beginning to answer such questions, but the findings don't always make it into the classroom.

Putting discoveries in cognitive science — the study of thought and learning processes — to work in education will happen, but the process is only beginning, says Bror Saxberg, chief learning officer at K¹² Inc., a Herndon, Va., firm that develops online-learning products. “When you look at how teachers are trained, there's still not much said about how minds work,” he says.

Here are some of the research findings that analysts say should be more widely understood by schools and families:

- Many American children and teens are overscheduled and overstimulated, putting their health and ability to learn at risk. What look like activities that lead to children's success, such as sports teams and music lessons, are “overstimulation that actually can stress a growing child's brain,” says Michael Gurian, a family therapist in Colorado Springs.

Parents should remember that “boredom is crucial” for children to develop their own personalities and talent profiles, Gurian says. “You have to let your kids be bored for at least an hour a day” — with no TV or computer — to figure out what they enjoy doing. “If they're never bored, they'll never find out who they are.”

Sleep is also crucial for brain development and learning, and “about 40 percent of children don't get enough,” Gurian says. Sleep deprivation is an unrecognized problem for many teenagers, too, says Denise Clark Pope, a lecturer at the Stanford University School of Education. “Not a lot of people know that adolescents need nine and a half hours.”

- Studies show “that kids who attend preschool — traditional, non-academic preschool — do well in K-12,” says Gary Mangioficio, CEO of Los Angeles Universal Preschool, an independent public-benefit corporation promoting preschool.

“However, some have backward-mapped from that to argue that we should focus on preschool as an academic thing, to begin preparing children at age 4 for the high-stakes testing they will face later,” Mangioficio says. But 4-year-olds' main developmental jobs include learning how to socialize, use their bodies in large-motor and fine-motor skills and get better control of their emotions — skills they must master before they can successfully tackle reading and writing, he says.

- Cognitive scientists say mastering a complex skill takes “10 years of deliberate practice,” according to Saxberg. “It's the way Tiger Woods keeps rethinking his swing.” After a period of slow, conscious practice, though, skills are mastered and move into “the huge infrastructure of subconscious modules in which expertise you've already developed is stored,” he says. That's what has happened once we can write longhand and think through an essay at the same time, he explains.

There's “no short cut” to going through an initial period of slow practice building any skill, says Saxberg. But the good news is that mastering a skill doesn't depend on innate talent but “whether you have the will, patience and interest to put in that practice,” he says.

- Another lesson from cognitive science is that minds do best “when they're challenged, but not too challenged,” says Saxberg. Teachers assigning homework must make sure that the work is doable and that kids have a way to prove that they've mastered the task; then they can stop practicing, Saxberg explains.

“Some teachers think they're doing the right thing by assigning mounds of worksheets for practice, he says. But once children know how to do it, they begin to hate the work, and their performance drops off, Saxberg says. Assignments that are too difficult also prevent students from performing well, he says.