"Multitasking"
Too much, too fast
For young people, a tendency to multitask may impoverish learning, productivity and even friendships.

By Rebecca A. Clay

Peek behind the bedroom doors of children and teens who are supposedly doing homework, and you may find they're doing that and much more – text-messaging friends, surfing the Internet and listening to iPods.

In fact, according to a 2006 Kaiser Family Foundation study, almost two-thirds of eight- to 18-year-olds using a computer to do homework are also doing something else at the same time. And during a typical week, 81 percent of young people report "media multitasking" at least some of the time.

Multitasking may seem modern and efficient, but research suggests that multitasking slows children's productivity, changes the way they learn and may even render social relationships more superficial.

Switching costs
Like their adult counterparts, young people often believe multitasking boosts efficiency.

Not so, says psychologist David E. Meyer, PhD, director of the Brain, Cognition and Action Lab at the University of Michigan in Ann Arbor. People who multitask actually take longer to get things done.

If a teen is trying to write an essay on Shakespeare while text messaging friends, says Meyer, that back and forth can cause "a kind of mental brown-out."

"You wind up needing to use the same sorts of mental and physical resources for performing each of the tasks," he explains. "You're having to switch back and forth between the two tasks as opposed to really doing them simultaneously."

Plus switching itself takes a toll: As you're switching, says Meyer, you're not on either task. And you need a mental warm-up to resume the suspended task.

In research published in 2001 in the Journal of Experimental Psychology: Human Perception and Performance, Meyer and colleagues found that people lost time switching from one task to another. The amount of time they lost increased significantly as the tasks became more complex or unfamiliar.

"As a result, the efficiency of getting the task done is much less than if you concentrated on one task from start to finish," says Meyer.

Less flexible learning
Despite teachers' best efforts, cellphones and other gadgets are infiltrating the classroom.

North Dakota school psychologist Tamara Waters-Wheeler, LSW, EdS, of the Morton Sioux Special Education Unit in Mandan estimates that the school confiscates an average of one or two cellphones every day.
Text messaging during class isn't just a high-tech version of passing notes. Because of its demands on attention, multitasking also may impair young people's ability to learn.

In particular, people with divided attention may not deeply integrate new information and may have trouble applying it later as a result, says Russell A. Poldrack, PhD, a neuroscience professor at the University of California, Los Angeles.

In a study published in 2006 in the *Proceedings of the National Academy of Sciences* (Vol. 103, No. 31), Poldrack and his colleagues asked participants to learn by trial and error to sort cards into different categories. Sometimes they could devote themselves exclusively to that task. At other times, they had to simultaneously listen to high- and low-pitched beeps and keep a mental tally of the high-pitched ones.

The participants learned the task even when they were multitasking, but they didn't learn it as well. That's because they were using a different kind of memory to learn while multitasking, says Poldrack: They were relying on procedural memory rather than the more flexible declarative memory. As a result, they couldn't answer questions asking them to apply what they had learned while multitasking.

An fMRI study confirmed the behavioral findings. When participants focused on the task, they relied more on the hippocampus -- the center of the declarative memory system. When they multitasked, they relied on the basal ganglia, one of the systems that builds less flexible memories.

Students with one eye on a teacher and one on a BlackBerry may be more likely to memorize facts instead of truly understanding them, says Poldrack. And, he adds, the quest for new information made possible by cell phones and other gadgets can be addictive.

"The entire culture is starting to look like what you see in attention deficit disorder, where there's a difficulty in focusing and distractibility," he says.

A recent study published by Common Sense Media suggests that may be true. In the meta-analysis of research going back to 1980, researchers from the National Institutes of Health and Yale University found that 69 percent of the 13 studies that examined media exposure and ADHD found a statistically significant relationship.

Waters-Wheeler has noticed a similar trend in the classroom."In the past, kids were more able to sit down and focus on things for much longer," she says. "Now they can only attend to things for a short period." They're also easily distracted, she says.

"It's not that they can't focus; it's that they focus on everything," she says. "They hear everything -- even things they would normally be able to block out -- because they are now so used to attending to many things at once."

Referrals for attention issues are up, she says. Many of these students don't have full blown attention-deficit hyperactivity disorder, she says. Instead, she says, "it's just the way they've grown up -- working short times on many different things at one time."

@sub:Superficial friendships?

@tx:Much of children and teen's texting and computer use centers on their friendships. A recent study by anthropologist Mizuko Ito, PhD, of the University of California at Irvine found that digital media plays an important role in the social development of the 800 young people she and her team interviewed. The MacArthur Foundation-funded study found that teens are using such media to hang out with friends and find communities that may not be represented in their own geographic area.
In doing so, the researchers say, they're learning important skills, such as managing large networks of friends and acquaintances.

But developmental psychologist Patricia Greenfield, PhD, isn't convinced that multitasking helps friendships any more than it helps learning.

"The same danger of superficiality applies," says Greenfield, who directs the Children's Digital Media Center LA and serves as a psychology professor at UCLA. "We evolved as human beings for face-to-face interaction. As more and more interaction becomes virtual, we could lose qualities like empathy that are probably stimulated by face-to-face interaction."

The effort to juggle multiple relationships is also problematic, Greenfield and coauthors say in a study published in the Journal of Applied Developmental Psychology (Vol. 9, No. 6). Noting that humans have traditionally had a few lifelong relationships, she says that young people using social networking sites like Facebook or MySpace often have more than 1,000 people in their networks.

"There's a danger that having a few long-term relationships is giving way to many superficial, fleeting relationships," she says. "The entire culture is starting to look like what you see in attention deficit disorder, where there's a difficulty in focusing and distractibility."

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