**Purpose:** to think about how the use of media technology affects the learning environment.

**Directions:** While you are reading the passage, highlight (or underline) and label facts and opinions that support the following statements. Label the highlighting in the margins with the number of the statement supported.

1. Students are often distracted when studying and taking in new information.
2. The brain is not designed to multitask.
3. Multitasking has negative effects on students' academic performance.
4. There are ways for students to become better at "monotasking".

### How Does Multitasking Change the Way Kids Learn?

Annie Murphy Paul

Living rooms, dens, kitchens, even bedrooms: Investigators followed students into the spaces where homework gets done. Pens poised over their “study observation forms,” the observers watched intently as the students—in middle school, high school, and college, 263 in all—opened their books and turned on their computers.

For a quarter of an hour, the investigators from the lab of Larry Rosen, a psychology professor at California State University-Dominguez Hills, marked down once a minute what the students were doing as they studied. A checklist on the form included: reading a book, writing on paper, typing on the computer—and also using email, looking at Facebook, engaging in instant messaging, texting, talking on the phone, watching television, listening to music, surfing the web. [At] the back of the room, the observers counted the number of windows open on the students’ screens and noted whether the students were wearing ear-buds.

Although the students had been told at the outset that they should “study something important, including homework, an upcoming examination or project, or reading a book for a course,” it wasn’t long before their attention drifted: Students’ “on-task behavior” started declining around the two-minute mark as they began responding to arriving texts or checking their Facebook feeds. By the time the 15 minutes were up, they had spent only about 65 percent of the observation period actually doing their schoolwork.

“We were amazed at how frequently they multitasked, even though they knew someone was watching,” Rosen says. “It really seems that they could not go for 15 minutes without engaging their devices,” adding, “It was kind of scary, actually.”

Concern about young people’s use of technology is nothing new, of course. But Rosen’s study, published in the May issue of *Computers in Human Behavior,* is part of a growing body of research focused on a very particular use of technology: media multitasking while learning. Attending to multiple streams of information and entertainment while studying, doing homework, or even sitting in class has become common behavior among young
people—so common that many of them rarely write a paper or complete a problem set any other way.

But evidence from psychology, cognitive science, and neuroscience suggests that when students multitask while doing schoolwork, their learning is far spottier and shallower than if the work had their full attention. They understand and remember less, and they have greater difficulty transferring their learning to new contexts. So detrimental is this practice that some researchers are proposing that a new requirement for academic success is the ability to resist a blinking screen or a buzzing phone.

The media multitasking habit starts early. In “Generation M²: Media in the Lives of 8- to 18-Year-Olds,” a survey conducted by the Kaiser Family Foundation and published in 2010, almost a third of those surveyed said that when they were doing homework, “most of the time” they were also watching TV, texting, listening to music, or using some other medium. The lead author of the study was Victoria Rideout, who was particularly troubled by its findings regarding media multitasking while doing schoolwork.

“This is a concern we should have distinct from worrying about how much kids are online or how much kids are media multitasking overall. It’s multitasking while learning that has the biggest potential downside,” she says. “I don’t care if a kid wants to tweet while she’s watching American Idol, or have music on while he plays a video game. But when students are doing serious work with their minds, they have to have focus.”

“Parents can draw a line when it comes to homework and studying—telling their kids, ‘This is a time when you will concentrate on just one thing.’ ”

For older students, the media multitasking habit extends into the classroom. While most middle and high school students don’t have the opportunity to text, email, and surf the Internet during class, studies show the practice is nearly universal among students in college and professional school. One large survey found that 80 percent of college students admit to texting during class; 15 percent say they send 11 or more texts in a single class period.

CAN THE BRAIN MULTITASK?

Texting, emailing, and posting on Facebook and other social media sites are by far the most common digital activities students undertake while learning, according to Rosen. That’s a problem, because these operations are actually quite mentally complex, and they draw on the same mental resources—using language, parsing meaning—demanded by schoolwork.

David Meyer, a psychology professor at the University of Michigan who’s studied the effects of divided attention on learning, takes a firm line on the brain’s ability to multitask: “Under most conditions, the brain simply cannot do two complex tasks at the
same time. It can happen only when the two tasks are both very simple and when they
don’t compete with each other for the same mental resources. An example would be
folding laundry and listening to the weather report on the radio. That’s fine. But listening
to a lecture while texting, or doing homework and being on Facebook—each of these
tasks is very demanding, and each of them uses the same area of the brain, the prefrontal
cortex.”

Young people think they can perform two challenging tasks at once, Meyer
acknowledges, but declares that “they are deluded. There’s nothing magical about the
brains of so-called ‘digital natives’ that keeps them from suffering the inefficiencies of
multitasking. They may like to do it, they may even be addicted to it, but there’s no
getting around the fact that it’s far better to focus on one task from start to finish.”

“Researchers have documented a cascade of negative outcomes that occurs when
students multitask while doing schoolwork. First, the assignment takes longer to
complete, because of the time spent on distracting activities and because, upon returning
to the assignment, the student has to re-familiarize himself with the material.

Second, the mental fatigue caused by repeatedly dropping and picking up a mental
thread leads to more mistakes. The cognitive cost of such task-switching is especially
high when students alternate between tasks that call for different sets of expressive
“rules”—the formal, precise language required for an English essay, for example, and the
casual, friendly tone of an email to a friend.

Third, students’ subsequent memory of what they’re working on will be impaired if their
attention is divided. Although we often assume that our memories fail at the moment we
can’t recall a fact or concept, the failure may actually have occurred earlier, at the time
we originally saved, or encoded, the memory. The moment of encoding is what matters
most for retention, and dozens of laboratory studies have demonstrated that when our
attention is divided during encoding, we remember that piece of information less well—or not at all.

Fourth, some research has suggested that when we’re distracted, our brains actually
process and store information in different, less useful ways. In a 2006 study in the
Proceedings of the National Academy of Sciences, Russell Poldrack of the University of Texas-Austin and two colleagues asked participants to engage in a learning activity on a
computer while also carrying out a second task, counting musical tones that sounded
while they worked. Study subjects who did both tasks at once appeared to learn just as
well as subjects who did the first task by itself. But upon further probing, the former
group proved much less adept at extending and extrapolating their new knowledge to
novel contexts—a key capacity that psychologists call transfer.

Finally, researchers are beginning to demonstrate that media multitasking while learning
is negatively associated with students’ grades. In Rosen’s study, students who used
Facebook during the 15-minute observation period had lower grade-point averages than those who didn’t go on the site. And two recent studies by Reynol Junco, a faculty associate at Harvard’s Berkman Center for Internet & Society, found that texting and using Facebook—in class and while doing homework—were negatively correlated with college students’ GPAs. “Engaging in Facebook use or texting while trying to complete schoolwork may tax students’ capacity for cognitive processing and preclude deeper learning,” write Junco and a coauthor. (Of course, it’s also plausible that the texting and Facebooking students are those with less willpower or motivation, and thus likely to have lower GPAs even aside from their use of technology.)

HELPING KIDS PRIORITIZE

Meyer, of the University of Michigan, worries that the problem goes beyond poor grades. “There’s a definite possibility that we are raising a generation that is learning more shallowly than young people in the past,” he says. “The depth of their processing of information is considerably less, because of all the distractions available to them as they learn.”

Given that these distractions aren’t going away, academic and even professional achievement may depend on the ability to ignore digital temptations while learning—a feat akin to the famous marshmallow test. In a series of experiments conducted more than 40 years ago, psychologist Walter Mischel tempted young children with a marshmallow, telling them they could have two of the treats if they put off eating one right away. Follow-up studies performed years later found that the kids who were better able to delay gratification not only achieved higher grades and test scores but were also more likely to succeed in school and their careers.

This ability to resist the lure of technology can be consciously cultivated, Rosen maintains. He advises students to take “tech breaks” to satisfy their cravings for electronic communication: After they’ve labored on their schoolwork uninterrupted for 15 minutes, they can allow themselves two minutes to text, check websites, and post to their hearts’ content. Then the devices get turned off for another 15 minutes of academics.

Over time, Rosen says, students are able extend their working time to 20, 30, even 45 minutes, as long as they know that an opportunity to get online awaits. “Young people’s technology use is really about quelling anxiety,” he contends. “They don’t want to miss out. They don’t want to be the last person to hear some news, or the ninth person to ‘like’ someone’s post.” Device-checking is a compulsive behavior that must be managed, he says, if young people are to learn and perform at their best.

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