



Tablets Sneak Up on Laptops

New machines offer flexibility and portability, but they may become popular only in certain fields

BY ANDREA L. FOSTER

THINK OF IT as an oversized personal digital assistant. The tablet personal computer is the latest gadget to vie for the attention of students, professors, and administrators.

But is it poised to overtake the laptop?

Students and professors at three colleges that received tablets free say the machines make for quick, unobtrusive note-taking and cooperative design work. But other officials familiar with tablets say they aren't ready for widespread use on the campus.

"It's an interesting concept, but it still isn't the right package," says Gregory A. Jackson, vice president and chief information officer at the University of Chicago. He says tablets must be lighter, and their batteries must last longer.

While different models vary, generally the tablets look like bulky clipboards. They are designed to combine the portability of a pad of paper with the computing power and wireless connectivity of a laptop. A tablet comes with a stylus that's used to write directly on the screen. Microsoft's Windows Journal software, which runs on tablets, saves handwritten script and can convert it, if sometimes awkwardly, into printed text.

Some tablet models have keyboards that swivel away from their screens, permitting the devices to be used like laptops. Or a user can rely on the stylus to pick out letters on a keyboard displayed on the screen. Many of the machines come with holders that let users prop them up on desks and attach standard keyboards and mice.

Prototype tablets were provided at no charge last year to chosen students and professors at the Massachusetts Institute of Technology and the University of Texas at Austin, under agreements with Microsoft, which created Microsoft Windows XP Tablet PC Edition (including the Journal software), the operating system for tablets.

Perhaps not surprisingly, Microsoft test-

ed the tablets at academic departments where the machines were likely to be very useful—design and mechanical engineering at MIT, and community planning at Texas. Students and professors in those programs frequently sketch and discuss designs, and the tablets' styluses and smooth drawing surfaces facilitate collaboration.

Marketing students at Bentley College, in Waltham, Mass., the third group to try tablets, also give the computers a thumbs-up. They are conducting research this semester intended to predict whether the machines will be widely embraced by colleges. Preliminarily, some of them say it may take a while for the tablets to incorporate many of the amenities that laptops offer, and to come down in price enough for students to see them as competitive with laptops. Tablets now range in price from \$1,900 to \$2,600—considerably more expensive than many laptops.

"In our class, the tablet would be perfect to go out and take surveys with," says Raymond E. Rodriguez, a Bentley senior majoring in marketing. "But would I want to travel with it? Not really, because my laptop gives me more flexibility." Unlike his laptop, he explains, none of the tablet models available now has an internal CD drive that would allow him to play CD's or DVD's.

"Instant messaging, music, movies, and games are as important as classroom note-taking and group collaboration in the 24/7 world of college students," says Perry M. Lowe, the marketing-class instructor. "Any successful personal computer serving the higher-education market will need to address all of these needs."

Critics also cite two drawbacks to tablets that work against portability, their main selling point. At around three pounds, current models are relatively weighty, and their batteries usually last only two to four hours.

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tery life in order to have handwriting recognition and easy graphical storage, it's not worth the trade-off," says Mr. Jackson.

EVOLVING DESIGNS

Some experts say those problems will be resolved within a few years. Just as color replaced black and white on computer screens, today's laptops will evolve to offer tablet features, says Alexander H. Slocum, a professor of mechanical engineering at MIT.

"They'll just become one," he says. "There will no longer be a laptop and a tablet."

An early test of tablets' popularity is likely to come in several months. Many students and professors don't buy computers until the late summer or early fall, and the tablet technology was unveiled only last November.

John P. Bailey, director of information technology for the U.S. Department of Education, predicts scattered usage of tablets on college campuses this fall.

Michael W. Humke, director of higher education for Hewlett-Packard, says the company's Compaq TC1000 tablet has prompted "interest and excitement" among college officials. Though no college has made a bulk purchase, he says HP has responded to competitive-bid requests from colleges seeking to buy tablets in quantities ranging from 1,500 to 16,000. He declines to name the colleges.









MIT participants in an international robot-design competition last summer were the first college students to test tablets on a widespread basis, after Microsoft gave them 25 Acer tablets in July. Students in the community- and regional-planning department of Texas' architecture school received 20 Compaq tablets last fall.

Microsoft also lent tablets to students in Mr. Slocum's mechanical-engineering design course, who like the machines enough that they're reluctant to return them for

Computers That Mimic Pen and Paper

Tablets, a recent innovation in computer technology, are attracting the attention of many students, professors, and administrators. In “slate” models, a user can write and draw on the letter-sized com-

puter with an electronic stylus. Other tablets are called “convertible” models because they are connected to keyboards and can double as laptops. Here are descriptions of eight tablets on the market:

								
	Acer TravelMate TMC104CTi	Compaq TC1000	Fujitsu ST4110	Motion M1200	NEC Versa LitePad	Panasonic Toughbook 18	Toshiba Portégé 3500	ViewSonic ViewPad V1100
Format:	convertible	convertible	slate	slate	slate	convertible	convertible	slate
Cost:	\$2,099	\$2,098	\$2,599	\$2,599	\$2,399	\$3,200	\$2,499	\$1,999
Monitor:	10.4 in.	10.4 in.	10.4 in.	12 in.	10.4 in.	10.4 in.	12 in.	10.4 in.
Weight:	3.2 lbs.	3 lbs.	3.2 lbs.	3 lbs.	2.2 lbs.	4.4 lbs.	4.1 lbs.	3.4 lbs.

others to use, says John R. Williams, a professor of civil and environmental engineering who is director of the Intelligent Engineering Systems Laboratory. "We're trying to buy 60 more now."

He is impressed by the tablets' processing speed, which rivals that of desktop computers—from 800 megahertz for the Acer TravelMate C100 to 1.3 gigahertz for the Toshiba Portégé 3500. "These are super-computers," Mr. Williams says. "If you went back five years, these were top-of-the-line workstations."

One of his students, Abel Sanchez, a Ph.D. candidate in information technology, used to step away from his computer to make sketches on paper, but now he draws them on the tablet. "The 'Aha!' moments I had while waiting for the bus, and other odd times during the day, are now captured electronically," he says.

Tarik A. Ward, a senior majoring in aeronautics and astronautics, uses his tablet's stylus to mark up problem sets, Web pages, class notes, and PowerPoint presentations.

One problem he notes is that the stylus is most effective on a tablet that is laid flat. That makes it awkward to alternate between typing on the keys, which is done while the tablet is upright, and using the stylus. What's more, he reports, the stylus has to be recalibrated often, the eraser function doesn't work well, and the computer freezes and crashes frequently. In addition, the latches and buttons are flimsy, Mr. Ward adds, which is particularly troublesome in a machine that people carry around a lot—and drop occasionally.

Mr. Slocum, who helped organize the robot-design competition at MIT, says the tablets helped students work together. One would start a drawing on the machine, and then several others would make additions, each using a different color.

Students who are in different locations can use the tablets to cooperate, he adds, since they can electronically send their sketches to classmates' machines. "When you work with paper, you can only collaboratively scribble when you're all in the same place," he says. "Everyone's scribbling with a black or a blue pen, and now you've got this spaghetti mess."

Second-year graduate students in Texas' community- and regional-planning program took Compaq tablets loaded with mapping and architectural software to a neighborhood on the Mexican border, where they worked from September to December to design a park. They say the tablets are convenient to use on the go. "I couldn't believe I was standing in the middle of a field . . . in a place without many of the basic necessities, and there I was writing, actually digitizing notes on my tablet," says Marilyn Shashoua. "It is as if you are carrying a clipboard."

A classmate, Melissa Handley, says the machine is too heavy to carry around for a long time. But she suffers from carpal-tunnel syndrome, and using the tablet's stylus instead of a keyboard gave her wrists a break. "I was able to use the tablet pen for many hours at a time without any problems," she says.

Mark S. Mazzola, another student in the planning program, doesn't own a laptop, but after trying out a tablet, he says his next computer purchase will be a tablet.

Some of the Texas students complain that the tablets' screens—like those of laptops—are hard to read outdoors. "Whatever you do to the settings and however much shade or cover you provide, it's very difficult to see things," says Anuradha Parma.

Others who've tried tablet models say the software that converts handwriting into printed text doesn't easily recognize styles of handwriting or distinguish between lowercase and uppercase letters. As a result, the screen's printed text is often filled with errors. "It was tedious to correct the mistakes," says Ms. Shashoua. Mr. Slocum and Mr.

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Williams say many of their students don't rely on the handwriting-conversion tool, preferring to save their notes as image files.

The option to work with handwriting and sketches gives tablets an advantage over the laptops, says Mr. Slocum. "Very rarely do you draw with just words. Maybe in an English class, but even then, sometimes you want to quickly highlight what you took a note on, or you want to circle something or draw an arrow and tie things together. Communication is not just in words."

COMPARING MODELS

At Bentley, the marketing students tested models during presentations by representa-

tives of Acer, Fujitsu, Motion, and Toshiba. Those manufacturers, along with NEC and ViewSonic, are also lending students tablets for their research outside of class.

"I like the feel of the Toshiba," says Peter Bonneau, a senior majoring in management. "The pen was really fluid, as opposed to the Acer and Fujitsu."

He's not convinced that students would use tablets to take notes in class, however. The company representatives pointed out the advantage of quiet note-taking on tablets, compared with the tap-tapping on a laptop's keyboard. But Mr. Bonneau says most students don't take notes with their laptops anyway.

Mr. Rodriguez, another senior, says he likes the simplicity of the tablet from Motion Computing. A slate without an attached keyboard, it weighs about three pounds, while the screen measures 12 inches diagonally, bigger than the 10-inch screens on many other models.

The Bentley students also are organizing focus groups and conducting surveys as they attempt to forecast whether other students will want tablets. In the meantime, many experts say that tablets, perhaps as an evolved form of laptops, will surely take hold on college campuses.

"Why wouldn't people want the opportunity to at least have a touch screen?" asks Geoffrey M. Palmer, president of InfoCater, a technology consulting company and tablet vendor in Newton, Mass., who has been a resource for the Bentley students as they conduct their market research. "Just being able to point to something on the screen is easier than using a mouse."

Most of the tablets that InfoCater has begun to sell to colleges are purchased by

teaching hospitals and other medical facilities. Health-care workers, constantly on the go, find the tablets convenient for both jotting down and retrieving patient data. Mr. Palmer says that he hasn't sold tablets to a college for widespread use, but that some students are buying the machines on their own. Many of those early adopters, he says, favor the Toshiba model, which sells for about \$2,500 and features a 12-inch screen and the speedy processor.

Michael P. Pickett, deputy chief information officer at Duke University, says tablets have benefits for administrators and faculty members. After meetings, trying to organize notes scribbled on yellow paper, he would have trouble finding specific information, he says. Now using a tablet, he can search his handwritten notes electronically, using key words.

And because he travels frequently, like other college administrators, he likes the portability of tablets. He has tried out models from Toshiba, Compaq, Acer, and NEC. "The odds are pretty good that I'll buy one," he says, adding that he prefers the NEC Versa LitePad because it is light and has a relatively large screen.

Tablets will take a few years to catch on with students, Mr. Pickett believes. Freshmen, in particular, seem less interested in a lightweight computer than in having a machine that allows them to play movies, songs, and games, he says.

But Mr. Jackson, of Chicago, is sticking with his laptop.

"If they come out with a computer that's thin like a piece of paper, that you can roll up and put in your pocket," he says, "that would be a breakthrough." ■