A Decade of Mobile Computing for Students

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Grove City College, a small, private, liberal arts institution in Western Pennsylvania, has entered their second decade of mobile computing for students in this school of about 2200. Each incoming freshman receives a laptop computing and inkjet printer during the fall orientation, all a benefit of the College's $15,000 room, board, and tuition.

The company that has succeeded yearly in supplying the freshmen computers has been Compaq (HP/Compaq) throughout. Compaq has worked hard to keep their presence at GCC, and in that relationship GCC has supplied Compaq with valuable maintenance data about each system, and in recent years, we have had an influence in the design of future models. GCC maintains its own repair shop with staff who are Compaq certified technicians. Average turn-around time for system problems is 24 hours.

Since the first year of the laptop program in 1994, the systems have evolved significantly since the first 25 MHz Compaq Contura 4/25c was handed out to students and faculty. As in most institutions of higher ed, the network has grown, covering classrooms, offices, and dorms. Intranet and Internet applications for teaching and learning have evolved as well. We currently have, for example, users of WebCT, Blackboard, and LMS (a course management system from Jenzabar, our administrative system provider.) Our network has grown and now features wireless hotspots in our major classroom building, student union, and intervening courtyard.

Note in the table that follows the systems that have been used in the GCC laptop program. The first year's system featured 4 MB RAM, a 120 MB hard drive, and no CD-ROM drive!

Year	*Model*	*Processor*	*Display*	*Memory*	*Hard Drive*	*Optical Drive*	*First Year For:*
1994	Compaq Contura 4/25c	486SL/25 MHz	9.5" Color VGA	4 MB	120 MB	none	.
1995	Compaq Contura 410	486DX2/50 MHz	9.5" Color Dual Scan	8 MB	350 MB	none	.
1996	Compaq Armada 1120	Pentium 100 MHz	9.5" Color Dual Scan	8 MB	810 MB	none	.

1997	Compaq Armada 1510	Pentium 120 MHz	11.3" CSTN SVGA	16 MB	1 GB	10X CD-ROM	PCMCIA Network Card (NIC)
1998	Compaq Presario 1230	Cyrix 233 MHz	12.1" HPA	32 MB	3.2 GB	24X CD-ROM	.
1999	Compaq Armada 1750	Pentium II 333 MHz	12.1" CTFT	32 MB	4.3 GB	24X CD-ROM	video output port, 56K V.90 modem
2000	Compaq Armada E500	Pentium II 500 MHz	12.1" CTFT/SVGA	64 MB	6 GB	24X CD-ROM	integrated NIC
2001	Compaq Armada E500	Pentium II 800 MHz	14.1" CTFT/XGA	128 MB	10 GB	24X CD-ROM	.
2002	Compaq Evo N600c	Pentium III 1.2 GHz	14.1" CTFT/SXGA	256 MB	30 GB	DVD/CD-RW	no floppy drive, 32 MB video RAM
2003	Evo N620c	Pentium M 1.6 GHz	14.1" DTFT/SXGA	512MB	60 GB	DVD/CD-RW	Wireless 10/100/1000 NIC, Pentium M Processor
2004	Compaq tc-1100 tablet	Pentium 1.1 GHz	10.4" XGA TFT	512 MB	60 GB	DVD/CD-RW	TabletPC, 56Kv92 modem

To start our second decade of mobile computing, the College decided on a significantly different system for the 2004-2005 incoming freshmen – the Compaq tc100 TabletPC. The Tablet with its Windows XP TabletPC Edition operating system, digital ink, and Microsoft's OneNote software, has been an exciting addition to the computing mix here at GCC.

The freshman system features Pentium 1.1 GHz processor, 10.4" XGA TFT display, 512 MB RAM, 60 GB hard drive, and DVD/CD-RW drive in a multiBay adapter. The faculty system has in addition to the basic TabletPC system like the freshmen's, a wire less mouse and keyboard, 17" flat screen external monitor, and docking station. Not all faculty have received a TabletPC last fall, but a core group of about 17 people from a variety of disciplines – those who were interested in trying out the TabletPC – or those who were scheduled to receive a new system anyway. (The Computer Science Department, for example, is scheduled to receive a new system every three years. Other departments may have varying schedules according to their needs.) Departments involved in the initial TabletPC offering were Computer Science, Religion & Philosophy,

Education, Business, Economics, Psychology, Education, Engineering, Chemistry, Biology, and Sociology.

The TabletPC with MS OneNote and the ability to use digital ink in Office applications has had significant impact on faculty and the way that they use the computer in the teaching/learning process. Following are examples of that impact.

1. Digital Ink is much more convenient and lends greater flexibility in PowerPoint. The stylus used with the TabletPC enables writing, drawing, commenting on PowerPoint slides in a manner much easier than with other pointing devices. Of course, the annotations can be saved or deleted.
2. With OneNote on the TabletPC with Outlook, the Tablet becomes my PIM and Handheld all in one. OneNote makes paper & pencil note-taking (with the inherent lost piece of paper). One can flag items that are ***Important, To Do, Question***, etc., and they are indexed and can be pulled into a summary with the click of the stylus. On top of that any word or phrase can be searched throughout the OneNote notebook, creating an index to every occurrence of the word. Phrases are found even when made in your natural cursive hand-writing! The natural, notebook size of the Tablet makes it very convenient to take it while traveling, long distance or short.
3. Grading papers becomes paperless! Student papers, created in Word and email or deposited into a digital drop-box of some sort, can be written on in digital ink with extensive markup in various colors. The file can then be emailed back to the student for review.
4. A math professor now uses the TabletPC and a blank PowerPoint instead of the chalkboard. When the notes are digital, they are easy to modify and share with students, if desired.
5. Education professors have to complete a myriad of forms during the student teacher supervision process. In the past, the forms had to be written out by hand during the observation process, then re-typed once back in the office. Now the forms are filled out in the field using the professor's TabletPC Input Panel in a Word form in which the cursive handwriting is automatically converted to typed text. This obviates the need to re-type the form at a later time. The form only needs to be saved and printed.

Students, in my opinion, need additional training either via workshops or in information technology classes in order to fully leverage the power of the Tablet. Faculty have an advantage in that orientation and workshop have been given to them in order to shorten the learning curve of using the Tablet. Student training is minimal at best at this point.

Pervasive laptop mobile computing certainly has had its advantages for the student: convenient access for research for their classes, convenient extensive communications, and a suite of application software than can be used in and out of the classroom. But computer-using students in the classroom during lectures has caused some concern on the part of faculty about the nature of the activities of the computer-using students. Students have been known to be chatting, checking email, gaming, surfing the net, etc. – the list goes on. Concerned faculty members have met to discuss strategies and policy concerning unwanted classroom computing activities. Strategies range from the extreme (banning computers) to zero-tolerance for misuse of systems, to denying letters of recommendation to offenders.

Here is one example of a "Computer Etiquette in Class," found in the syllabus of Dr. James Dupree, Business & Entrepreneurship, Grove City College:

1. I welcome your use of your personal laptop/tablet PC in class for taking notes, etc.
   a. I expect you will turn your wireless capability OFF during class and not be plugged into the Internet.
2. As a future professional "in training" I expect you will adhere to the following guidelines.
   a. Use your computer for note-taking or other class-relevant activities.
   b. You may access the Internet or other web sources if they are of immediate relevance to our discussion, i.e., accessing elements of an online discussion we had via Blackboard.
   c. All use of your computer should be subtle and non-distracting to classmates.
3. Do not:
   a. E-mail, IM, etc., while in class.
   b. Work on any assignment or project not immediately relevant to the ongoing class.
   c. Surf the web while in class. E-bay, Hollywood.com, etc., are not acceptable searches.
4. Violation of this policy will result in your being permanently banned from using your computer in class.
   a. Zero tolerance, one violation, and permanent ban for the semester.

5. Judgment as to the appropriateness of your action is at my discretion and is not subject to debate.

One of the machines that the College is considering for next year's freshmen is the newer HP Compaq Tablet PC tc4200, a "tabletPC" that resembles it laptop cousins yet features a larger display (12.1") and digital ink and handwriting.

The mobile computing initiative has been largely successful at GCC. Our graduates have a step up being able to use a computer in their discipline and careers. The newly added TabletPC strengthens this advantage and gives each student and faculty member a powerful teaching/learning tool.