Hewlett Packard

- Technology for Teaching grant update
This grant started as a means of assessing the benefits of Tablet PC's for students with disabilities. An examination of how students with disabilities (predominantly hearing loss) related to non-disabled students, in the classroom, was done over the period of one year. It became clear that, while there was benefit to using the tablets, something bigger was happening behind the scene.
This ‘something’ prompted the application for another grant, and an examination of backchannel chatter while using the tablets. 4 Information Technology classes were examined, with an average of 31 students per class. Students revealed that the laptops were ‘fun’ to use, but that the temptation to surf was great.
For group work with Deaf and HOH (Hard of Hearing) students, it made communication easier. For completing group work, documents could be shared on the tablets, and the tablets could also be used for IM (Instant Messaging).
Overall, the students found the lure of the internet too seductive in the classroom, and would prefer not to use them. Yet for group work, the tablets became a huge bonus.
Backchannel Chatter

Divided attention and Learning
The game!
“This backchannel thing isn’t going away, folks. We have to learn to live with it, to live in it, to thread it into our tools and activities.”

Elizabeth Lawley
What is it, this chatter thing
IRC

- Internet Relay Chat (IRC) is a form of real-time internet chat or synchronous conferencing. It is mainly designed for group communication in discussion forums called channels, but also allows one-to-one communication via private messages.
Divided Attention

Doonesbury
by Trudeau
The players...
This new generation

- The thumb generation. Tech-Saavy, early adopters, multi-taskers. Claim to be good at dividing attention.
Other professors were reluctant to participate, so the only faculty perspective is mine!
The toys....
Tablet PC’s

- twenty available for use
- in teams, Deaf student teams received 4
- Deaf students were placed on separate teams
Justification

- designating to one team for convenience reduces individual choice
Tablet Maintenance

- Cart of 20 machines, which needs to be wheeled from place to place
- All machines need to be plugged into the cart, and the cart itself plugged in
- Virus protection updates once a week
The Venue...
The classes...

- average of 31 students per class
- average of 2 Deaf, HOH students per class
- overall, had 4 learning disabled students who self-identified
- one student with severe social skills problems, who self-identified
Declining numbers

- In the Information Technology department, the numbers of Deaf/HOH students have declined over the last several years.
Classes

- While class sizes have remained the same, the numbers of Deaf/HOH students have decreased from between 6-8 per class to 1-2 students
Electives

- There were no Deaf/HOH registrants in the two blended classes I planned to examine for this project.
The project

- Students were informed of the research, but refused to participate if keylogger was used.
Keystroke logging (often called keylogging) is a method of capturing and recording user keystrokes. A Keylogger program can be useful to determine sources of errors in computer systems, to study how users interact with systems, and is sometimes used to measure employee productivity on certain clerical tasks.
Waived

- In the interest of doing the research, that component was discarded, and self-disclosure, surveys and one-to-one interviews were used.
Course grades

- Course average grades were also examined from two previous classes for the same course. The content remained the same, and the same instructor delivered the materials.
Grades

- Course A: 24 A, 8 B, 2 C, 1 F
- Course B: 18 A, 8 B, 1 D, 2 F
- Course C: 28 A, 4 B
- Course D: 12 A, 13 B, 3 W
The Outcome
Surveys

- Student surveys revealed:
  - The laptops were ‘fun’ to use, but the temptation to surf was great
  - For group work with Deaf/HOH students, it made communication easier
Surveys

- All of the students had used laptops before.
- All of the students had used AIM or MSN before.
Group Work

- For completing group work, documents could be shared on the tablets, and the tablets could be used for IM
30% of the students would NOT want to use computers in this classroom.

Clarification of ‘this’ classroom revealed that the content is primarily verbally delivered, and proceeds rapidly.
But...

- Aren’t most classes?
- Apparently not.
- Students felt it would be advantageous in classes which are heavy on powerpoints.
Tablets

- ...are popular for the ability of the user to use a stylus and write his/her own notes, even on powerpoint slides.
Another But...

- The laptops were very useful for team time.
Students who used laptops for notetaking felt it was harder to keep up watching the pictures or charts, or listening to the lecture, while taking notes.
• Which seems to be in contradiction to their ability to multitask!
Communication

- Students who used the machines for communication felt they were a positive addition to the classroom.
Survey

- The initial survey indicated that students anticipated the tablet laptops would be useful in notetaking.
Outgoing survey

- Indicated that this was not the case.
Deaf/HOH students indicated that it was too difficult to watch the interpreter and type on the laptop.
One student used c-Print before, and said the notes were already available to him, but that the tablets were great for groups. (There were no c-Print operators in these classes.)
Walking...

- When walking through the class while lecturing, I discovered many of the students were surfing or checking their mail. One student was playing a hockey game. (He must have known I am Canadian!)
6 counts

- On 6 walkabouts, an average of 40% of the class with laptops (Personal or tablets) were surfing, checking mail, reading the news, or playing a game. Many also had an IM window open.
This does not take into account the number of students who stop doing something as I begin to walk....
To heart

- Various research indicates that there is a window for attention, and unless the format changes every 10-15 minutes, we’ve lost them.
While trying to keep this in mind, it is not always easily doable in the classroom with the content I need to deliver.
The numbers
Course A, group work: Out of 5 groups, the Deaf group students were using IM for communication and work. Out of the remaining three groups, two used IM. (It was a VERY quiet class!)
Course B: With 5 Deaf students, I felt the most excited about this class. Teamwork went smoothly. I separated the teams so that there was one Deaf student per class, by numbering off the students and not allowing self-elected groups.
There was therefore one team which had two Deaf members.
The groups used the tablets for IM, and it was clear from the excitement and laughter that everyone was communicating. (Not necessarily about the course, but Hey!)
It was one place where Deaf students had an advantage. Being early adopters of technology, Deaf students can type very fast!
Class C: While there was only 1 Deaf student, there was one student with ADD and one student with a Asperger’s syndrome.
Before using the tablets, the class was disrupted frequently by the student with Asperger’s syndrome.
Team time was frustrating because no one wanted to work with him. He interrupted constantly and did not stay on task.
After the tablets were used for team time, and after the project was concluded, one hearing student approached me and told me how brilliant the student was, and how much the tablets improved the team.
They chose him as a team-mate for the second project.
The student with Asperger’s Syndrome approached me after class and told me that using the tablets made an incredible difference in how he could participate in the team environment.
• Course D had 1 hard of Hearing student and 2 students with Learning Disabilities. The Hard of Hearing student was not an NTID-registered student.
Honestly...

- Students were asked how much work they accomplished while having the tablets. 20% indicated that perhaps they missed some notes.
Quiz grades

- Their quiz grades differed. In week four, a quiz was given. The grades for the students who had the laptops were frequently lower than the students without laptops. These were Deaf and hearing students.
Definitive

- This is by no means definitive, since I had no prior knowledge of how these students would score in general. But it did seem to indicate a trend.
Deaf Student thoughts

• Some comments from the Deaf students...
• “I liked having the laptops for team time because I can type faster and say more than with an interpreter.”
“Team work was easier using the laptops. We even drew our draft on the computer and then talked about it at the same time.”
“It was good to not be always put on the Deaf team.”
“I liked that there was no problem sharing interpreter with 5 people.”
| Course A | 24 | 8 | 2 |   | 1 |
| Course B | 18 | 8 | 1 | 2 |   |
| Course C | 28 | 4 |   |   |   |
| Course D | 12 | 13| 3 |   |   |
| Table course | 18 | 12| 1 |   |
| Non-tablet | 10 | 13| 1 | 1 |   |
Surprise!

- The courses which used tablet pc’s had a higher overall letter score in the A/B range, than the classes that did not use tablet pc’s.
Past Courses

- Students, on average, performed better with the Tablets than not having the tablets.
Credibility?

- This is certainly not pure research.
- One colleague pointed out that I could be getting softer in my old age.
- It is possible that, the longer I teach this subject, the better I become at delivering the materials.
Since the group projects comprise of 40% of the grade, it could also be that using tablets increases sociability, which makes for a better team and learning environment.
In conclusion,

- The project surprised me. I anticipated that the tablets would cause lower grades, simply because past experience with teaching appeared to indicate that students who brought their laptops did not appear to be paying attention.
The reality...

...was that for courses such as mine, which are team oriented, the tablets seemed to be facilitating more communication, and allowing students of all abilities to work together better.
A recent Logitech study revealed that people, on average, have six applications open on their computer at any one time, and the active window switches or a new window opens every 50 seconds. To navigate the vast content at their disposal, people spin their mouse's scroll wheel approximately 26 feet in an eight-hour day. It'd be nice to know the demographics of those studied, but still, a 50-second attention span is pretty sad.
Is technology to blame? For the instant gratification-I-want-it-now people, yeah. We’ve become mouse potatoes.

For multitasking and learning in the classroom? The jury is still out, but it’s looking like **GASP** our kids were right.