We Have the Whole World in the Palm of Our Hand

Plano Independent School District has been supporting four classroom projects involving Palm handheld computers this past school year. These projects are being investigated to give evidence as to whether these devices can help deliver on the promise of 1:1 student-to-computer ratio. The questions raised, along with the answers found, will help determine our strategic direction concerning handheld devices for the next few years.

A group of 8th grade middle school students have been placed in the same academic team to utilize handheld technology in algebra, English, history and science. This is our most comprehensive study of the impact of this technology and also one of the Palm Pioneer in Education grant awardees. Software such as ImagiGraph, ImagiProbe, PalmReader, Docs to Go, AvantGo and others make the use of the Palms an immersive experience for the entire day of these students and including home use.

The Palms were the responsibility of the students as they were issued to them along with a keyboard for the entire school year. The following summaries are some of the applications that these 8th graders used during this project. Many students found the Palm to be another essential classroom tool.

Palm Reader- http://www.peanutpress.com

The Palm Reader application enables you to read ebooks such as The Scarlett Pimpernel on their Palm handhelds. They can download a chapter at a time or the entire novel during one synchronization. This application gives the student several options. Font size, scrolling text, and screen preferences are all choices the students can set. Students are also able to make annotations during their reading. Each annotation is saved as a memo when they choose the export annotation option. During synchronization, the annotations are stored on the student's Palm Desktop under Memos. Teachers are able to check the student's comprehension of the chapters being read by quickly viewing their annotations or by having the students beam their annotations. Many free books and other materials can be downloaded from www.memoware.com.

Docs to Go- http://dataviz.com

Documents to Go Professional Edition (version 4.0) allows for transferring of Word documents, Excel documents, PDF files, and PowerPoint Slideshows to your Palm handheld via the Docs to Go desktop. As students begin working on an assignment on their classroom computer and want to complete it at home, they are able to add the assignment to the Docs to Go desktop and sync it to their handheld. The document will

hold its formatting but will not export the graphics. The word [Image] shows up as a placeholder for the original image. Many of the same editing options offered in Microsoft Word are available in Docs to Go. Students use Docs to Go to help them take notes during class discussions. They are then able to share notes as this application allows them to beam a selected item. If notes are beamed to someone that does not have Docs to Go on their handheld, the "read only" portion of this application can be beamed along with the document.

Due Yesterday- http://www.nosleep.net/yesterday.asp

This application helps students to easily keep track of classes, upcoming assignments, and grades through an easy-to-use interface. By installing the desktop software, data may also be entered on your desktop computer. This software and all upgrades are free! After installing **Due Yesterday** on their handhelds, they will be able to set up their classes, specify types of assignments along with grading options, and add daily assignments as needed.

ImagiProbe- http://imagiworks.com/Pages/Products/ImagiProbe.html

This application is an excellent tool when used to conduct scientific investigations. The system uses a Sensor Interface that connects the Palm to a sensor connector that connects to the probe. Temperature, light sensor, pH, dissolved O_2, force and motion, and conductivity are a few of the probes that are available for your Palm. Not all brands of probeware are compatible with all handheld computers. Be sure to check with ImagiWorks before ordering probeware.

ImagiGraph- http://imagiworks.com/Pages/Products/ImagiGraph.html

The **ImagiMath** software is a suite of three applications, **ImagiGraph, ImagiCalc,** and **ImagiSolve.** Each is a separate tool that may be used in any algebra class. Students used **ImagiGraph** during the graphing unit of the curriculum while looking for patterns and doing problem solving. This application helped students understand what in an equation causes a parabola to move to the right or left, and up or down. Students also used **ImagiGraph** to graph equations and discover connections between parts of the equation and the graph. Students were able to write a summary of the activity and print out or beam their results to their teacher.

Go 'n Tell- http://www.handhelds.hice-dev.org/download.htm

This application is used in conjunction with the PalmPix camera to compile a scrapbook of documented photos and text. Students first give their scrapbook/project a name and then take pictures and enter text about the photo. Each picture has its own page with a section to write text. Scrapbooks may be beamed page by page; photo only, text only, or the entire project can be beamed at one time. The students' scrapbooks are saved on their

handheld and can be edited at any time. They may also save to any desktop computer by syncing. When synchronization takes place, a scrapbook directory is created and individual pictures are saved as .jpg images. In addition to having individual images, an. html file is created including all images and text. What an easy way to share activities over the web! Students may now publish their research, field trip events, and other class projects right to the web with this function of **Go N Tell.**

AvantGo- http://avantgo.com/frontdoor/index.html

This application allows students to download part or all of an Internet site when syncing to their Palm. **AvantGo** will update the student's Palm with a current webpage each time synchronization takes place or at any specified interval. By downloading the San Andreas Fault site (http://pubs.usgs.gov/gip/earthq3) to their Palm, students were able to complete the activity shown on pages 4 and 5 of this handout. During the activity, students were able to analyze and draw conclusions from the information. They were able to gain a further understanding of the forces shaping the earth. The teacher beamed the analysis questions to the students thus enabling the students to use their Palms to complete the project and beam their results back to her for evaluation.

As you can see, the students had a very busy year with their Palms. We continue to evaluate the use of Palms in the classroom but all agree that using the Palms was beneficial to most students. Academic team members met almost daily throughout the year and held weekly meetings with an Instructional Technology Specialist. The open communication provided a forum for discussion regarding ongoing refinements to the project. These continual discussions with students and teachers have enabled us to make adjustments to improve the effectiveness of the project for the coming year.

The San Andreas Fault

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Objective: To read scientific text, analyze and draw conclusions from the information. To gain a further understanding of the forces shaping our earth.

Materials Needed: Desktop computer with Internet access, PALM PDA, PALM keyboard, PDA cradle, AvantGo software application

Prerequisites: Using the AvantGo application, students need to download the Web site, http://pubs.usgs.gov/gip/earthq3/ to their PDA. Teacher should beam analysis questions to students.

Procedure:

1. Assign students a partner to work with. One PDA will be used to scroll through the Web site, and the other PDA will be used with keyboard to answer the questions.

2. Students need to read through the Web site information on the San Andreas Fault.

3. Students are assigned analysis questions to answer in complete sentences.

4. At the completion of the assignment, students beam their finished documents to the teacher.

Assessment: Analysis questions.

Notes: See attached analysis questions.

The San Andreas Fault

1. How old do scientists estimate the San Andreas fault to be?

2. What two plates comprise the boundaries of the San Andreas fault, and what is their direction of movement?

3. What landforms are characteristic of the San Andreas fault?

4. What type of fault is the San Andreas?

5. What causes a “great” earthquake?

6. **What is the average rate of movement per year along the San Andreas?**

7. What causes the vibrations that produce earthquakes?

8. What are the two basic types of earthquake waves? According to the diagram, which of these waves travel through both solids and liquids?

9. What is the unit of measure for the size of an earthquake?

10. Compare and contrast “magnitude” and “intensity”. Identify the scale used for each.

11. What has the greatest effect on the “intensity” of an earthquake?

12. What are seismic gaps?

13. In recent history (geologically speaking), how often has the southern San Andreas produced large earthquakes?

14. What signs are geologists looking for to predict the next great earthquake along the San Andreas?

15. Describe the three lines of defense being developed against earthquakes.