

Teaching and Learning with Personal Digital Assistants

Steve Chi-Yin Yuen

The University of Southern Mississippi, USA

Patrivan K. Yuen

William Carey University, USA

INTRODUCTION

Personal digital assistants (PDAs) are small handheld devices initially designed for use as personal organizers. They can store documents, spreadsheets, calendar entries, games, databases, and lots of other resources normally associated with a laptop or desktop computer. PDAs are relatively inexpensive and highly portable and are designed to utilize small, low-bandwidth files and applications. They are able to perform limited PC tasks such as word processing and spreadsheet analysis and newer PDAs are capable of Web browsing and e-mail functions via wire or wireless connected to networks. Also, they can synchronize with desktop computers and laptops to download Web sites via channels and work off-line. Furthermore, PDAs offer infrared communication, allowing data to be transferred across short distances between devices without the need for networks. The latest developments offer wireless connection via mobile phone networks or Bluetooth, and many combine phone and PDA functions in one unit (Aclear.net, n.d.). This article will provide an overview of PDA technology including advantages and limitations and the use of PDAs in teaching and learning, as well as the future trends. This will help educators assess the use of PDAs in teaching and learning environments and determine how PDAs can be integrated into the curriculum.

BACKGROUND

Computers can be great learning tools when used effectively, but high costs have long hindered teachers from providing each student with a desktop computer or laptop of their own. Some educators indicated that computers have not have a positive impact on teach-

ing and learning because students and teachers have limited access to them, and, thus, are not using them (Soloway, Norris, Blumenfeld, Fishman, Krajcik, & Marx, 2001). Thus, many teachers have been exploring the less-expensive handheld option. Already common in the business world, PDAs are now being introduced into schools. Today, PDAs such as Palms and Pocket PCs are making technology accessible, affordable, and fun for teachers and students alike. More and more school officials believe that PDAs, which are relatively inexpensive compared with laptops or desktop computers, are the best way to put a computer in the hands of each student (Soloway et. al, 2001). This addresses an important equity issue because PDA brings together the power of handheld technology with the ease, convenience, and low cost of small portable devices, thereby offering a solution to access and equity issues.

Advantages

PDAs provide a feeling of true ownership. Unlike the desktop computers or laptops which are generally shared with other students in the computer lab or classroom, PDA can be a true “personal computer” for students. Like desktop computers, PDAs can be expanded by adding various software or hardware. They can be used as scientific graphing calculators, digital cameras, cell phones, digital voice recorders, global positioning system (GPS), or scientific sensing devices. Their small size makes them easy to carry from class to class and from school to home, giving PDAs a major advantage over the desktop computers and laptops. This portability, combined with powerful data processing and versatility, makes PDAs a significant educational tool (Pownell & Bailey, 2001). PDAs offer more versatility than desktop computers and are much more portable than the laptops. Many educators

believe PDAs will transform educational technology in schools. There are many advantages of using PDAs in education and training:

- Small size, lightweight, and high portability.
- Instant access with no waiting for boot-up.
- Access Internet, e-mail, and the electronic diary.
- The ease of synchronization and sharing of data by infrared “beaming.”
- Flexibility for supporting a wide range of learning activities.
- Can be used anywhere.
- Files and information can be transferred between teachers and students quickly and learners can produce individual/team work easily and effectively (Lockitt, 2005).
- PDAs enable students to interact with each other more effectively (Lockitt, 2005).
- Long battery life.
- Less expensive than desktop computers or laptops.

Problems

Despite the potentials of PDAs in education, some school districts see the problems of using PDAs in the classrooms. The PDAs are not universally advocated by educators. Among the major concerns are the theft risk, high cost, and distraction resulting from the misuse by students. PDAs can be a threat to classroom order and student integrity. Some schools have banned their use because some students use the PDAs to cheat on tests, play non-educational games, or e-mail friends inside or outside the school (Shields & Poftak, 2002). In addition, current PDAs have many limitations: (a) the computational power tends to be low, (b) multimedia is problematic, (c) lack of print-out capability, (d) writing extended documents via stylus-input is inefficient, and (e) the screen is too small.

PDA Technology

PDAs are small and lightweight handheld computers that are designed to be personal information manager (PIMs). PDAs are commonly referred to as handhelds, Palms, and PocketPCs. Most PDAs have touch-sensitive LCD screens, with pen/stylus input, and moder-

ate processing power. Most feature stylus input and handwriting recognition. The handwriting recognition systems are reasonably accurate. Palm Operating System (OS) devices use a special set of stylus strokes that the user must learn, whereas Microsoft’s Pocket PCs can recognize cursive handwriting quite well once trained. Both are reasonably accurate and good for taking short notes. When attached to a portable keyboard, PDAs can be used for serious data input. Users find PDAs more convenient to carry around than laptops (Smith, 2003).

There are two main operating systems (OS) for PDAs: Palm OS and Pocket PC. Pocket PCs run a mini version of Windows specially designed for mobile devices. PalmOS devices (e.g., Palm Pilots, Palm Zire) run on the PalmOS operating system. Unfortunately, software is not interoperable between these two operating systems. Most PDAs today are powerful enough to run mini versions of the popular office applications and Web browsing. Some have small built-in keyboards or connect to attachable keyboards. Usually, PDAs include a docking and synchronization cradle for battery charging, administration of application software, and data transfer and backups. Although the provided built-in memory is usually limited on some PDAs, they can be expanded with additional memory. The most popular formats of memory support are secure digital (SD), compact flash (CF), and Memory Stick (Naismith, Lonsdale, Vavoula, & Sharples, 2004). In addition, many third party suppliers provide various add-on cards for the memory expansion slots such as wireless (WiFi) cards, Bluetooth cards, global positioning system (GPS) cards, and camera cards.

Although a full range of software is now available on most PDAs, most users use their PDAs for these applications: calendar, address/contact lists, calculations, notepad, e-mail, diary, e-books, and Internet. However, increasingly PDAs are being used for other tasks such as word processing, spreadsheets, databases, telephone calls, taking and displaying photographs, recording and playing voice/video, listening to music, and making presentations via PowerPoint. Information, and files on the PDA can be easily synchronized with a laptop or desktop computer via a docking cradle or wireless connection. With connection to the Internet now commonly available for PDAs through modem or wireless services, PDAs can also be used to access the Web and serve as global tracking devices both in and out of the car (Lockitt, 2005).

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