



Research Brief

Handheld Computers in Education

Question: What strategies are successful for school leaders to integrate and maintain handheld technology in schools?

Summary of Findings:

For over the last twenty years, educators have been trying to find the best practice in using technology for student learning. Some of the most widely used applications with computers have been student learning of programming, word processing, Web research, spreadsheets, games, and Web design. The difficulty with integrating many of these activities into the curriculum for teachers is the lack of accessibility to the computers because of single-computer classrooms and over-scheduled computer labs. Laptops have been included in some schools to address these concerns but have found to also be cumbersome, limited in capabilities, and expensive. One of the new developments in educational technology that may make these difficulties obsolete has been the introduction of the PDA (Personal Digital Assistant) into the classroom.

Palm or handheld technology was introduced into the business sector about eight years ago to facilitate sharing of information and for increasing distant interactions among mobile corporate employees. As with many technological developments, educators began to explore this new technology that provided the portability of a cell phone and the capability of a desktop computer. For example, in a study prepared by SRI International in 2001 that surveyed 102 teachers who adopted handheld devices into their lessons, responses indicated that there was a positive impact of PDA's on student learning and there was a supportive reaction by teachers to its' integration into the curriculum (Crawford and Vahey, 2002).

In addition to the SRI project, some studies have also provided evidence that handheld technology can be an enhancement to the educational experience for students and for teachers as well. Students who use handheld computers may take a greater responsibility for their homework by checking their calendar for assignment due dates and then prioritize their work and study schedules more effectively. Also, students tend to prefer using the handheld computers to traditional notebooks for recording assignments and can also use the portable computer to check spelling and math (Bauer and Ulrich, 2002; McFadden, 2001). Teachers can benefit by using handheld computers because it allows them quick access to student attendance, grades, and performance assessment charts. Teachers who use handhelds may also experience greater professional development by having more time for meeting the needs of the students, reinforcing concepts taught in class, and refining preexisting knowledge of the students (Caughlin and Vincent, 2003; Roblyer and Edwards, 2000).

Overall, the student can benefit when using handheld computers because it may allow them to have more control over their learning while the teacher can spend less time on classroom management and devote more time to planning and preparation. When used for an activity, handhelds can become so intuitive that the focus is on the tasks, skills, or curriculum, and not on the technology. Handheld computers have many



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uses for the educator and student including reading e-books, creating and editing documents, finding online information, web clipping, installing and storing pictures and images, creating quizzes, and downloading data and applications.

HANDHELD TECHNOLOGY INTEGRATION

General considerations for handheld technology implementation

- Establish a committee from members of the school and community to oversee planning, integration, and maintenance of handheld technology
- Propose a budget that will considering costs of equipment and software, maintenance throughout the school year, upgrades, and future purchases of additional units
- Consider implementation models for student to computer ratios such as individual, paired, stationary classroom sets, and mobile handheld labs
- Develop a curriculum that will address the emphasis of usage in areas such as skills learning, organizational skills, Web-based activities, subject specific lessons, and research activities
- Collect and distribute to school leaders and teachers some examples of lessons and activities for handheld technology to focus on concerns that may arise from integration
- Identify staff members who are comfortable and enthusiastic about handheld technology to orient others to the advantages and applications of the devices
- Implement written policies that address such issues as home usage of handhelds, damage, loss, theft, and parental involvement in the student upkeep of their computers
- Organize summer workshops and locate online tutorials for teachers to increase confidence in handheld usage in the classroom

Specific considerations for handheld technology integration

- Determine the need at your school for handheld technology by looking at areas such as inventory of tools already available, barriers to implementation, and level of technology integration that is cost-effective
- Analyze the actual learning outcomes that are desired as a result of handheld implementation to assess what hardware and software tools will be necessary to achieve those goals
- Consider the capabilities and difficulty of use when purchasing new handheld technology to determine training needs and level of integration into the curriculum
- Project future needs for upgrades, software and hardware purchases, and determine capabilities of devices for those needs
- Assess the actual longevity of devices and the frequency of use to look at the benefits of specific implementation models to meet your needs
- Establish an identification system for all devices for easy tracking and inventory



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Maintaining handheld technology integration at school

- Implement student routines that require daily charging, syncing, and file management
- Introduce rules that address student use of devices such as beaming information during class, installing unapproved software, illegal copying of software, and cheating
- Provide open training sessions throughout the school year that allow the school community to learn new applications and to address frequent technical problems that are occurring
- Post reminders to students to highlight health issues that arise from overuse such as eye strain, muscle tension, and repetitive stress injuries
- Develop an elective class that provides additional handheld training for learning new applications and for troubleshooting techniques that focus on hardware and software problems
- Create online and text-based manuals as a reference for school-wide policies on handheld usage
- Develop student projects that compile lessons and activities for handheld technology and make copies available for all classrooms
- Establish a school network or Web page that allows teachers to have a forum for discussing issues with handheld usage and for sharing lessons that use the devices

Online Resources:

Handheld.tie.net

This website has been developed as source of information for handheld users in education with an overview of research, ideas for assessment, and more

[Getting a Handle on Handhelds](#)

This article provides educators with issues to consider before using handheld computers in the classroom.

[Instructional Technology Resources](#)

The purpose of this site is to provide resources that focus on areas such as e-books, leadership, teacher proficiency with technology, and the use of handhelds in the classroom.

[Donna McGauley's Instructional Technology Resources](#)

This site provides support for teachers who are using handheld computers in their classrooms with palm project resources, lesson plans, student uses, news, applications, discussions, and tutorials.

[At Ease in the Handheld World](#)

An editorial from coverage.com that briefly looks at some issues involving handheld computers in the classroom.

[Eduscapes.com](#)

This web page compiles multiple online resources such as articles, grants, and lessons for integration.



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[Goknow.com](http://www.goknow.com)

Connect to a provider of educational software, curriculum, and professional development for handheld computers.

[Top 10 Palm Tips and Tricks](#)

A list of ideas for educators who are implementing handheld computers in their classroom.

[K12 Handhelds](#)

This site provides resources and ideas that cover handheld applications for teachers, students, and administrators.

[Kathyschrock.net](#)

This page provides educators with resources for effective use of the handheld computer in support of teaching and learning.

[Usability and Accessibility of Handhelds in the Classroom](#)

This website provides information and ideas for the use of the handheld computer as an assistive technology for students

[Power in the palm of your hand: Using handhelds to transform teaching and learning:](#)

This article explores previous research for the benefits of handheld computers, handheld technology in the classroom, and student usage.

[101 Great Educational Uses for Your Handheld](#)

This website lists 101 different uses that educators can benefit using handheld computers in a school environment. This site also provides information on handheld computer devices, applications, professional development, classroom management, grants and additional resources.

[Handheld Lesson Plans](#)

This site offers educators with a choice of many activities utilizing multiple Palm applications starting from grade 2.

[Handheld Educator](#)

This site provides information on innovative classroom activities, assessment, and classroom management techniques that use handheld technology.

[Bridging the Disconnects](#)

This website provides educators with over 500 lesson plans for using the handhelds in the classroom.

[Bridging the Disconnects](#)

Multiple resources for educational leaders who are considering integrating technology into the curriculum.



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Techlearning.com

This article briefly looks at some issues arising from integrating handhelds into the classroom.

Additional Resources

Bauer, Anne M.; Ulrich, Mary E. (2002). "I've Got a Palm in My Pocket": Using Handheld Computers in an Inclusive Classroom." *Teaching Exceptional Children*, 35, 18 – 22.

Caughlin, J. and Vincent, T. (2003). *Handheld for Teachers and Administrators*. Watertown, MA: Tom Snyder Productions.

Crawford V. & Vahey, P. (2002). *Palm Education Pioneers Final Evaluation Report*. Menlo Park, CA: SRI International Information Literacy, *Handheld Educator*, 2, 14, 1.

McFadden, A. (January 2001). *This Tech's for You: Personal Digital Assistants (PDAs) Part III*. *International Educational Daily*. [Online].

<http://members.iteachnet.com/webzine/article.php?story=2001011514490321>

Roschelle, J. (2003). "Unlocking the Learning Value of Wireless Mobile Devices." *Journal of Computer Assisted Learning*, 19, 3, 260 – 272.

Ray, B. (2003). "Handheld Computers in the Classroom: Integration Strategies for Social Studies Educators." *ED 482 480*.

Roblyer, M.D. & Edwards, J. (2000). *Integrating Educational Technology into Teaching*. Merrill: Upper Saddle River, NJ.

Soloway, E. (2000). *Supporting science inquiry in K-12 using Palm computers: A Palm Manifesto*. Center for Highly-Interactive Computing in Education. Retrieved December 18, 2000 from the World Wide Web:

<http://hi-ce.org/palm/solowayletter.html>

<http://www.principalspartnership.com/>

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