

Using Handheld Devices for Cooperative Learning Activities

John Lustig

Minnesota State University, Mankato

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Dr. Jesseman

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In my opinion, mobile communication devices are the next piece of technology that will change how learning takes place in schools. It seems only natural that cellphones, iPods, and other mobile devices will shift away from being seen as a nuisance and will become accepted and desired for students to possess in schools. The continuing evolution of this technology and how ubiquitous they have become in every other aspect of people's lives tells me that schools should embrace these low cost and powerful tools and accept that in regard to their presence, if they cannot beat them, they might as well join them and benefit from what they offer.

I predict that by the time my seven year old son enters high school, that some type of personal communication device (smartphone, iPod, etc.) will be required by the school for each student to have. I base my prediction on a few things, but primarily on how evolving mobile devices will allow education to also evolve and meet the demands and needs of 21st century students by providing learning opportunities that, as Sa' and Carrico state in their abstract, allow "users to learn ubiquitously and to proceed with their work at any time and place" (p. 1145) and for teachers and students to cooperatively work together by sharing information via transferring it between mobile devices.

Sa' and Carrico's paper focuses on using a specific computer application, which they refer to as a framework, called Test-IT. In their paper, Sa' and Carrico describe how teachers and students can use Test-IT either on a desktop computer or a handheld device, and can even synchronize their data and information between each having the ability to move back and forth between the comfort of a desktop interface and the convenience of a mobile interface when they need them. Their paper was published in 2006 and describes using a PDA for a handheld device, but Sa' and Carrico acknowledge that the concepts they address will apply toward any device "capable of connecting to the internet and browsing through webpages" (p. 1145). The portability of handheld devices allow students and teachers to "use them in the classroom, during field trips, at home, or wherever the learning or students' activities occur" (p. 1145). According to Sa' and Carrico PDAs are suited for use by children, because of their small, lightweight size, and that they are wireless and virtually peripheral free. In addition to delivering tests, PDAs are attractive to students because they also allow them to play games, read e-books, and safely collaborate and communicate.

Considering the positives that PDAs offer students, Sa' and Carrico state that the main reason for their low use in schools is because of the limited amount of educational software

available, and that most of the software available is non-collaborative, "which contrasts with researches that show that the learning process is more successful where there is strong collaboration" (p. 1146).

Sa' and Carrico suggest that Test-IT is a solution for using handheld devices in classrooms, because it will allow teachers and students to communicate, collaborate, and share data through the ability of teachers to create customized tests and content, and annotations for students to easily access in and out of school.

At the time of publishing, Sa' and Carrico identified that data was shared between teacher and student devices by both wired and Bluetooth wireless synchronization protocols, but that a new version of Test-IT was being developed where data would be transferred in real-time communication between devices through a wi-fi network, thus eliminating the need to synchronize devices. Considering that this article was published three years ago and being personally familiar with the evolution of wi-fi based hardware and networks over this time period, it seems natural that any application or framework for handheld devices in schools would migrate to an Internet based environment.

The components that seem to set Test-IT apart from other applications is how it combines the ability for teachers to create and customize tests and content for students with built-in tools for analysis and annotation. Test-IT allows teachers to choose how students should answer questions. Test-IT does not limit tests to only have multiple choice questions. Answering options can be either a drop-box menu, free-text entry, or a combination of these. This flexibility allows teachers to customize tests and adapt them "to the students' capabilities and perceived needs, as well as the environment where the [test] is going to be completed" (p. 1147).

The annotation tool in Test-IT allows teachers to gather information and comment on existing information providing students with timely feedback. According to Sa' and Carrico completing annotations in Test-IT is a simple process and provides an easy opportunity to collect data in and away from class. The analysis tool in Test-IT provides more than simple scoring analysis of a test. Teachers can use the analysis tool to filter information allowing them to look at results data that can be matched with relevance to individual student details. Individual test question results and annotations can be correlated with any other piece of data in a student's record, including other annotations.

In developing Test-IT, Sa' and Carrico conducted simulations in various settings to

provide feedback as the interface was being developed. Sa' and Carrico found that the devices themselves were not intrusive to the learning environment and conversely the ability to collect data while moving around the classroom and "from classroom to classroom captivated all the teachers' attention" (p. 1148). Sa' and Carrico also found that eventhough students preferred using PDAs, teachers preferred using a TabletPC version of Test-IT, because it provided a larger work space.

Through their simulations and software testing, Sa' and Carrico discovered that using Test-IT provided an advantage for both teachers and students. When using Test-IT, teachers took 50-80% less time to create a customized test than when compared to completing the same tasks without the system. These results demonstrated to Sa' and Carrico "that the tool can be effectively used for test creation and content organization" (p. 1149). Test-IT is a benefit for students through the immediate feedback that the tool provides along with a "new means for cooperation" (p. 1149) and "help...when a tutor is not around" (p. 1149).

Even though I could not locate any other information on the Internet about Test-IT other than this article, I believe the concepts and discoveries discussed in the article shed light on what components will enable handheld devices to be successfully utilized in a classroom environment. Sa' and Carrico acknowledge that, at the time of publishing, there would be new functionalities added to Test-IT as they evolved. They specifically cite integration of voice interaction, the use of different media types, and a web-browser native to Test-IT as examples.

Considering the functionality of Test-IT and that we are in an era of data-driven decision making, I am surprised that I had not heard of Test-IT. I think through its collaborative and customizable interface it embodies what is needed to better utilize computers for learning. It also seems very efficient for collecting and manipulating data, and providing feedback. I think the important thing to take from this article is that as much as we see and set our focus on the type of hardware, the important thing is how we utilize the hardware.

References

Sa', M. & Carrico, L., (2006) Handheld Devices for Cooperative Educational Activities. In Proceedings of SAC'06, ACM Symposium on Applied Computing, Mobile Computing and Applications Track, Dijon, France, *ACM Press*, 1145-1149. Retrieved from ACM Portal via Google Scholar Link, <http://doi.acm.org/10.1145/1141277.1141549>