Recent advances in technology have led to the increased popularity of online courses. While availability of online courses offer many advantages, they are often criticized for not providing much, if any, human interaction. Interacting with a teacher only through a computer or technological device limits communication modes that are crucial in the teaching and learning process. Hall and Hall (2010) explain that people communicate with more than just words; they communicate through facial expressions, tone of voice, bodily gestures, and even by how near or far they stand to each other. This type of communication can be crucial as it helps children learn appropriate ways of interacting with others.

Nevertheless, the world has become technologically oriented, and so students need to learn how to use new technology if they are to be prepared to function well in the world. The purpose of this article is to discuss the educational value of handheld wireless computers, and how they can be used in schools to lead students to academic gains.

Handheld Wireless Computers
Today’s educators are exploring the potential of mobile wireless technology to improve learning (Kim, Holmes, & Mims, 2005). Mobile wireless devices perform similar tasks to desktop computers, such as providing access to the Internet, storing information, sending e-mail, and playing videos. These handheld devices include personal digital assistants (PDAs), cell phones, BlackBerries, iPhones, iPods, cameras, and a variety of add-on hardware extensions (Churchill & Churchill, 2008). “Smartphones” can run Windows Mobile and many other types of software, and iPods, which are better known for playing audio and video, can use different kinds of software that can be used for learning purposes (Schachter, 2009). The portability and affordability of handheld wireless computers are distinct advantages for school use.

Research on Teaching With Handheld Computers
Research on the educational value of handheld computers in K-12 settings is limited, but suggests that these devices can be quite useful. Baya’a and Daher (2009) conducted an experiment using mobile phones to teach mathematics with 32 eighth-grade students. They report that the mobile phones helped students learn mathematics outdoors, explore mathematics independently, learn mathematics in real-life situations, visualize mathematics, use new and advanced technologies to perform diversified mathematical actions, and learn mathematics easily and efficiently. This study concludes that while mobile technologies do have the potential to distract students, they also offer many opportunities that have not yet been realized.

Patten and Craig (2007) investigated ESL classrooms in elementary and middle schools to explore the effect of iPods on student achievement, using “audiobooks” via the iPods. Data was collected on verbal responses, test responses, journals, and pre/post scores on a language test. The researchers conclude that “the iPod provides a tool for engagement [but] does not, in and of itself, teach or lead to higher scores” (Patten & Craig, 2007, p. 74).

Lacina (2008) found that the use of iPods could enhance learning in school. After observing classrooms in which students were using iPods, she concluded that the iPods can provide students with listening and vocabulary practice after school, leading them to learn new words and phrases at their convenience. Lacina also found the iPods to be motivating and engaging, and comments that they allow
students to keep up-to-date with the latest technology.

Gulchak’s (2008) study demonstrated that a mobile handheld computer could be used to increase on-task behavior with an 8-year-old male with emotional and behavior disorders. Churchill and Churchill (2008) found that handheld computing devices can benefit students by serving as:

- Multimedia access tools that provide video, audio, and access to the Internet and various types of files, such as Adobe PDF, Microsoft PowerPoint, Microsoft Word, Microsoft Excel, and Macromedia Flash
- Connectivity tools that students can use to ask questions, get in touch with others, and engage in discussions
- Capture tools that students can use to take photos of documents and pictures of places
- Representational tools that help students create representations of their ideas using mind-mapping software, such as Inspiration
- Analytical tools that provide students with standard and advanced graphic calculators

Advantages for Using Handheld Technologies: Do They Help Students Academically?

Barone and Wright (2009) stress that it is critical to prepare students for the new digital literacies that are evolving. Allowing students to develop skills to access and learn from the increasing number of digital literacies through handheld computers is one way to accomplish this goal. Teachers can help students learn new vocabulary words as they read a story on a handheld computer that provides an image and definition of new words. In addition, students can do a writing assignment or answer questions based on an electronic book, using a handheld computer to practice publishing in electronic format. Language arts teachers can use electronic books to teach students how to gain access to educational materials electronically. Many e-books are available for free on the Internet; one of the largest collections of free books, Project Gutenberg (www.gutenberg.org), makes almost every public domain work available online (Bell, 2006). Today’s electronic learning resources allow text to be linked with video, audio, and interactive tools.

Such tools invite readers to physically interact with the text through inserting, deleting, or replacing text; marking passages by highlighting, underlining, or crossing out words; adding comments by inserting notes, attaching files, or recording audio comments; and manipulating the page format, text size, and screen layout. Search features allow the user to locate specific words or phrases within the text or access a particular page. (Larson, 2009, pp. 255-256)

Although handheld computing devices, with their small computer screens, may not always be the best tool for accessing academic resources, they are useful when students have nothing else to use or when it is not practical to use a larger computing device. Schools that cannot afford a computer for each child may be able to purchase enough handheld computing devices to serve as an alternative to laptops or desktops (Ray, 2002).

Handheld computing devices have other advantages. Soloway (2000) argues that they make it easy for teachers and students to share files and to include comments; thus, students can revisit written work more frequently. This increased communication and sharing of information can mean enhanced quality of written work (Ray, 2002). Schachter (2009) describes how a 5th-grade teacher at Trinity Meadows Intermediate School in Texas uses these devices by assigning students to draw solar system orbits, move decimal points around to change number values, take pictures for projects, explore educational websites, and compose Word documents. Schachter reports that 55 children at this school were participating in a pilot study using cell phones for their educational capabilities.

A “Green” Technology

Handheld learning devices are a “green” technology that can help students and teachers save paper in many ways. Students can get assignments and send them back to the teacher, using the mobile devices. Teachers can then grade them and send the graded assignments back to the students.

Software is available that permits teachers to keep track of student attendance on a handheld device, and to take notes on student progress. Teachers also can keep records of important information on students, such as reading levels, contact numbers, and medical needs, and this can be sent electronically when necessary to other teachers or administrators (Ray, 2002). Grade books also can be maintained on the handheld computers, allowing students to have quick feedback about grades.

Disadvantages of Using Hand-held Technologies: Distractions, Bad Habits, and Cyber Offenses

Although handheld computers can help students in many ways, they also have the potential for abuse. Adams (2007) discusses
how they can “promote cheating, cyber bullying, and other bad habits” (p. 22). Furthermore, Internet communities and blogs do little to prevent insults and slander, and Adams (2007) explains how these communities have had to raise their standards to prevent vicious attacks on people’s reputations.

Although handheld computers can permit students to have access to important educational resources, they also expose children to advertisements and inappropriate content that can distract from academic performance (Adams, 2002). Furthermore, if students overuse digital devices, they may be less responsive to lessons that cannot be delivered via a mobile device.

The potential that handheld devices have for distracting students has caused some school districts to ban students from using them on school grounds. In Keller, Texas, for example, students at Trinity Meadows Intermediate School are not allowed to use cell phones, and violators have their devices confiscated and must pay a $15 fee to get them back (Schachter, 2009). However, this school recently launched the pilot study with 5th-graders discussed previously to explore whether “smartphones” could be used for educational purposes.

Another concern about using handheld technologies relates to the software currently available for K-12 settings. Ray (2002) reports that most of the software developed for these devices is for business use; as a result, teachers who want to use handheld technologies will likely need support and assistance to develop effective lesson plans. Educators also need to realize that the small screen size on handheld computers may not permit students to do everything they can do on a laptop or desktop. Churchill and Churchill (2008) discuss how one educator perceived the small screen as a limitation of handheld computers, but also discovered that a presentation could be designed in a way for it to be easily accessible through the small screen.

Where Do We Go From Here?
Many schools are experimenting with handheld mobile devices, but Schachter (2009) reports that it may take a long time for schools to fully implement them as learning technologies. Many educators are enthusiastic about the educational potential. Tyre (2002), for example, discusses the positive impression handheld computers had on teachers when the Palm Education Pioneers Program was launched in 2001. This was the first large-scale evaluation study of handheld computers in K-12 settings and included over 100 teachers. Teachers were each given a handheld device and had the freedom to organize their lessons using it. The researchers then examined the teachers’ attitudes through surveys and site visits and concluded that they were “overwhelmingly positive” about the use of handheld computers in the teaching and learning process. Ninety-one percent of the teachers reported that handheld computers were valuable in improving written work through the word processing software features.

Although researchers investigating technology sometimes report that initial enthusiasm over a given computing device often wanes with time, Tyre (2002) reports that researchers were surprised to find that motivation to use the handheld computers increased with time. In addition, this study indicated that teachers could take measures to help prevent students from using the devices inappropriately.

Harris (2008) recommends that each student in school have an iPhone and discusses how schools could create software to let this computing device act as a homework helper, hall pass, agenda, and student handbook. He also mentions how it can increase safety by allowing students to keep records of emergency contacts. Soloway, Norris, Blumenfeld, Fishman, Krajcik, and Marx (2001) believe that schools will only become serious about computing technologies when each student has a handheld device, and that computing will not become routine until these devices are as readily available as pencils.

Conclusion
Handheld wireless technologies can become extremely important in the near future for many reasons. They are more affordable than other types of computers, they can help schools go “green,” they allow teachers to monitor students and perform other classroom tasks much more easily and efficiently, and they can motivate educators and students alike. Critics argue that handheld devices will distract students, lead children to use them inappropriately, and even addict them to electronic stimulation. In addition, computers cannot replace teachers and can be overused. Students still need to learn how to interact well with other people.

Schools frequently respond to potential problems with mobile technologies by banning them. A survey done recently indicates that about 70% of schools around the United States do not allow students to use cell phones during the school day (Schachter, 2009). While students can and do use these devices inappropriately, research indicates that with control measures in place, use of the devices can be beneficial.
BUILDING QUALITY IN SUMMER LEARNING PROGRAMS: Approaches and Recommendations. McLaughlin, B., & Pitcock, S. Baltimore: National Summer Learning Association, 2009. 38 pp. This report identifies characteristics of successful summer programs designed for children living in high-poverty areas. Summer learning programs (SLP) are included in the report as an “emerging subset” of summer programs that offer activities specifically designed to close the achievement gap for the targeted populations of children. The organization for these programs is changing as communities partner with agencies, academic institutions, school systems, and faith-based organizations to provide sustainability.

Several recommendations are provided to ensure quality across SLPs. First, the curriculum for SLPs should be flexible and adaptable in nature. Using the existing standards for the traditional academic and afterschool-time care curricula, a framework for SLPs could be initiated. With a focus on complementary learning, SLPs can deliver curriculum that covers many aspects of children’s cognitive, emotional, and physical well-being. Additionally, some SLPs have no connection to any entities that can provide direction in professional development and quality assurance matters related to curriculum, funding, and sustainability. Consequently, partnerships should be pursued between organizations that can scaffold the SLP. Finally, SLP personnel need a strong knowledge base and level of professionalism to ensure high-quality experiences and instruction.

Communities and institutions could use this report to advocate for extended school year programs. It is available through The Wallace Foundation or the National Summer Learning Association. For more information, visit www.summerlearning.org.

EFFECTIVE AND PROMISING SUMMER LEARNING PROGRAMS AND APPROACHES FOR ECONOMICALLY DISADVANTAGED CHILDREN AND YOUTH. Terzian, M., Moore, K. A., & Hamilton, K. Washington, DC: Child Trends, 2009. 42 pp. Economically disadvantaged children are likely to lose more ground over the summer in reading and math than their middle- and upper-income counterparts. One of the successful strategies to help close the gap for economically disadvantaged children is participation in a summer learning