

# Mobile Learning Update



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*"We are at an inflection point for the use of mobile communication devices. The release of new devices and applications, including the new Apple iPhone 3G, highlights the rapidly expanding interest in handheld devices that are both phones and computing capable. Our mobile telephones are evolving into platforms for collaboration, knowledge access and performance support. The MASIE Center is convinced that one the next frontiers will be designing learning and performance applications that fit naturally into our hands, pockets, purses and lives. We invite the learning field to think "out of the box" and take an evidence-based approach to exploring these capabilities."*



*Elliott Masie, The Learning CONSORTIUM*

## Why Mobile Learning Now?

The "buzz" about corporate mobile learning grows louder with each day. Organizations no doubt recognize that mobile technology for learning has merit. Handheld devices have the potential to effectively "push" and "pull" information and deliver learning whenever/wherever employee needs arise. Yet, despite all the excitement and curiosity, few corporations have fully embraced mobile learning. We are left wondering: when will corporate investments catch up with all the excitement? For what applications/circumstances does mobile learning work? We are eager to see how mobile technologies will impact corporations globally. The potential is enormous.

According to market research conducted by Ambient Insight, LLC., it is estimated that "corporate and business expenditures for mobile learning products and services in the US alone will reach over \$246.9 million by 2011." Their research indicates that the largest demand throughout the forecast period is for custom development services, content conversion, and media services and that the healthcare sector accounts for 20% of the total US market for mobile learning. In their 2008-2013 US Market for Mobile Learning Products and Services report to be released later this summer, Ambient Insight expects to revise their mobile learning forecasts further upward. Several factors point to an increasing commitment to mobile learning.

## The Pace of Corporate Change

Corporations must be more nimble than ever to compete in the marketplace; employee connectivity to information is paramount. Change permeates each and every aspect of the corporate landscape, including structures, processes, and strategies that must adjust regularly to support business needs. In this information age, filled with change, it's a more challenging environment than ever for employees to perform. And, while it seems employees would need more time for learning to support their productivity, they have less time to participate in formal learning activities. In the recent MASIE Center Voice of the Learner poll, 81% of employees reported they are busier today and have less time to focus on learning. The time is right for weaving technologies that support quick, informal, anytime/anywhere learning into the learning landscape.

## “Connected” and Mobile Society Embraces Cell Phones & Capabilities

We have grown to expect connectivity wherever we are. Cell phones are ubiquitous and are the ‘go to’ device for staying connected. There is no doubt that we are becoming a much more mobile society. The Netsize Guide 2008 revealed that mobile devices have penetrated over 85% of the US population. In fact, the latest study by Pew Internet and American Life Project of 2054 adults found that the cell phone is the technological tool Americans would have the most difficult time giving up. That is a change from the landline, which topped the list just two years ago. The Pew research also indicated that 62% of all Americans have some experience with mobile access to digital data and tools away from home or work using a wireless laptop connection or with a handheld device.

Cell phone users are also taking advantage of the new capabilities. According to the Pew Internet and American Life Project, text messaging utilization has increased from 41% in April 2006 to 58% today. On a typical day, 31% of cell phone owners use text messaging and 15% use the devices' camera features. About 8% use the phone to play games.

It should be no surprise then that a large percentage of employees already access large percentages of their email through mobile devices, when it is most convenient for them. It's only natural that we should seek to more fully realize the impact mobile tools can have at work in general and in our individual work performance.

## Technological Enablers

A “Perfect Storm” is driving mobile learning adoption rates. At the same time that the user demographic is growing, content and technology suppliers, and mobile learning service are getting better and more innovative. Several major technological advancements have made learning on a mobile device more desirable and accessible.

Advances in software, services and hardware are rapidly making this possible. Device manufacturers refer to their offerings as multimedia computers rather than cell phones. They are capable of delivering videos and simulations in addition to text, email and voice messaging. In the past few years input capabilities,



battery life, storage capabilities and user interfaces have all improved – and continue to improve. In addition, the availability of high-speed cellular networks with unlimited use plans continues to grow.

The enhanced browser experience on the iPhone has changed the competition and the common view of the potential of these devices. The hype over the iPhone has definitely created excitement about mobile device capabilities. Some of the first applications released for the iPhone were those that support knowledge access and performance support.

Tools from Google, Yahoo! and others now provide optimized mobile experiences, plus enterprise applications are beginning to respond to requests to provide mobile access and support. LMS (Learning Management Systems), LCMS (Learning Content Management Systems) and authoring vendors are also at the table with mobile capabilities.

Growing interest is obvious to us as recent presentations at conferences and events have had standing room only audiences and we see other information requests related to mobile learning continue to grow. We continue to publish resources on mobile learning on mLearnopedia at <http://www.mlearnopedia.com>.

### **Mobile Learning: *Knowledge in the Hand***

While you may initially think of mobile learning as delivering eLearning on small form factor devices, or often referred to as eLearning “lite”, it has the potential to do much more than deliver courses, or parts of courses. We define mobile learning (commonly referred to as mLearning) as all “*knowledge in the hand.*” It includes the use of mobile/handheld devices to perform any of the following:

- Deliver Education/Learning
- Foster Communications/Collaboration
- Conduct Assessments/Evaluations
- Provide Access to Performance Support/Knowledge

Today, any number of portable devices can quickly and easily deliver and support these functions. Cell or smartphones, multi-game devices, personal media players (PMPs), personal digital assistants (PDAs), or wireless single-purpose devices can help deliver coaching and mentoring, conduct assessments and evaluations (e.g., quizzes; tests; surveys/polls; and certifications), provide on-the-job support and access to information, education and references, and deliver podcasts, update alerts, forms and checklists. In these ways, mobile learning can enhance and support more traditional learning modes, making it more portable and accessible. Mobile devices can also serve as powerful data collection tools and facilitate the capture of user created content.

The future holds many experimental mobile initiatives, plus other context specific opportunities we have not yet discovered. Included today are games, simulations, sensor-driven tracking and feedback, location-based, and “point and shoot” learning. Our journey continues ....



## The US Lags behind both Europe and Asia in Mobile Learning

Certainly the US is behind much of Europe especially Scandinavia, Japan and other geographies that have had a single standard in place longer and have been able to develop in a core, single and unified path.

According to figures from Gartner, the global smartphone market grew 29.3 percent in the first quarter 2008, over the first quarter of 2007. In North America, smartphone sales were up 106.2 percent. Nokia sold nearly 14.6 million smartphones, followed by Research In Motion's (RIM) BlackBerry at 4.3 million and Apple at 1.7 million. While dominant worldwide, only a small percentage of smartphones sold in the United States run the Symbian operating system.

Currently the vast majorities of devices are acquired from a carrier and are locked into what that carrier provides. Sprint and Verizon handsets use CDMA (Code Division Multiple Access) while AT&T and T-Mobile handsets use GSM (Global System for Mobile communications). Today phone carriers call the shots and control the capabilities of the devices. There is some hope that this will change in the next year. First the iPhone with all its hype has shaken up the industry and now with Google's Android and the Open Handset Alliance, the future looks brighter. Rather than requiring application development based upon the device and operating system, browser delivery can also simplify deployment.

However, a significant number of media integration and new technologies related to location have some firm roots in the US and are starting to be used in conjunction with both government standards for RFID (Radio Frequency Identification) and GPS (Global Positioning System). Some of the standards are being implemented for safety reasons — like the e911 initiative, a mobile phone location requirement from the government to help emergency workers pinpoint the location of a 911 call made from a cellular phone.

## Current State of Mobile Learning

Below is an executive summary of a recent survey conducted at the MASIE Center that taps into current mobile learning practices and future plans and desires across the Learning CONSORTIUM. The data reflects the responses from over 200 members:

- 24% of respondents currently deploy some mobile learning in their organizations.
- The most common transactions on a mobile device currently include placing and receiving organizational phone calls (98%), emails (91%), and text messages (83%).
- Many use mobile devices for writing/word processing (68%) and to deploy audio podcasts (63%).
- 73% of mobile learning today is not integrated with an LMS.
- 52% of respondents use in-house resources to develop mobile learning.
- 53% of mobile learning initiative funding comes from a Training department.

## Of the Organizations that Currently Deploy Mobile Learning

- Nearly 80% supplied mobile devices to their employees.
- 70% supported the use of personal devices for mobile learning.

## Interest/Plans for Future Mobile Learning

- 38% of organizations are not currently planning any mobile learning.
- 26% are currently building a business case.
- Popular future deployment plans for mobile devices include assessments/surveys (77%), performance support (73%), and study aids (70%).
- Members showed a significant interest in using mobile devices to provide voice recognition (93%), display books (82%), display Flash (64%), and enter data (61%).
- A wide range of implementation challenges served as obstacles to implementing a mobile learning initiative. They include limited resources (11%), organizational acceptance (11%), and access to mobile devices (10%).

Although not surprising, the barriers to adoption were interestingly much higher by those organizations that had not yet implemented mobile learning, than for those who had. Lack of standards was an issue raised as well as easy integration with an LMS. Other issues cited were hardware related including battery life, screen size, input usability and security.

## Practical Examples of Mobile Learning

Although there were a few initial initiatives using the Apple Newton in learning, it was not until 1996 and the release of the Palm Pilot and its instant access that many researchers got excited about the potential use of mobile devices in learning. Small pilots took place, mainly in the K-12 space and thousands of applications have been created during the past ten years.

Windows Mobile devices gained market share in 2000 and have been challenged by the RIM BlackBerry in the corporate and government sector. Now that instant communications are available through cellular and/or wireless networks, a whole new world of opportunities for mobile learning has opened. The iPhone has also demonstrated a great user experience and has thus raised the bar for others. In many cases, mobile access may be the first choice of learners.

Let's take a look at a few mLearning examples from corporate, education, and government.

### Corporate

In the corporate arena, many recognize the need for just-in-time training and performance support and are beginning to explore mobile options. In the medical, sales, and service areas, mobile is being used most widely. Specific projects related to mLearning from the corporate side have involved organization such as Merrill Lynch, Sun Learning Services, Chrysler, Microsoft, 3Com, and Valero Energy. Podcasting has also become widely deployed in US corporations.

#### Merrill Lynch GoLearn

Merrill Lynch has shared information on their successful initiative entitled GoLearn. The initial pilot involved offering three mandated courses both via MLU (Merrill Lynch University) and via the BlackBerry.



Standards for delivery on the BlackBerry were established in design, technology, security and privacy.

The goals of the pilot included proving the access, usage and the effectiveness of learning delivered via the BlackBerry to the global population. Additionally they sought to:

- Deliver training with no degradation to learning effectiveness
- Achieve 25% of eligible participation
- Achieve a comparable average score to the control groups and
- Obtain a 10% higher completion rate in 10% less time

Over a seven-week period, the learning materials were wirelessly pushed to over 2,100 investment bankers and select support staff.

The outcomes exceeded the goals. Higher scores were obtained in half the time. Bankers who completed the training did so in 54 less minutes and tested higher on the final assessment tests than the remainder of the firm. Mobile users also completed their training twenty days earlier than those who trained via MLU.

VPs and higher leveraged the mobile materials the most. Of the 2100 eligible employees, 61% launched the content at least once. 317 people completed 704 courses. Overall the mobile learners obtained a 12% higher completion rate in 30% less time than the control group.

170 employees responded to a survey indicating:

- 99% felt the format and presentation supported the learning
- 100% would complete more training in this format
- More than 75% praised the benefits of convenience, time management and training with no distractions

With this successful pilot, Merrill Lynch is moving into the next phase with additional training topics such as onboarding for new hires, ethical decision-making, performance management, market abuse, and sexual harassment.

Additional results will be forthcoming, but these initial results are very encouraging.

### **Chrysler, LLC. Mobile Learning for Knowledge Management**

Chrysler has recently undertaken a major initiative that will fundamentally shift their approach towards learning and using mobile devices. They have enjoyed the success of courses on mobile phones and wireless PDA devices for several years and now want to lay a foundation that will support extensive, widespread mobile learning for their Dealerships and the representatives that support them. They will launch a comprehensive search portal and LMS system that will track and categorize extensive amounts of tacit Chrysler knowledge and learning content. Using a search portal, mobile users will be able to search for answers to frequently asked questions and information that currently lies in disparate places. All information will be centralized and searchable on the portal, as well as tracked on their new LMS.

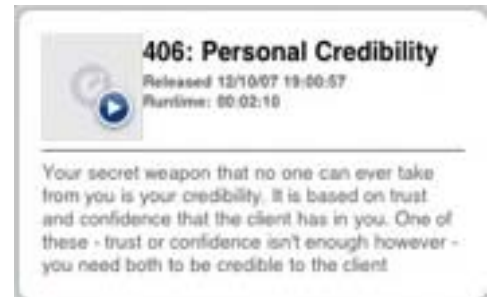
With a new foundation in place, they expect to utilize their portal to deliver various types of mobile learning at Chrysler. This includes delivering courses, disseminating assessments and evaluations, and regularly pushing corporate communications out to their sales force.

## Sun Learning Services Mobile Learning

Sun Microsystems has implemented a very forward-looking system for employee and partner training and performance support. Training videos are available "just in time, just the right size and exactly what they are looking for." For those without Wi-Fi connectivity, content can be preloaded using Really Simple Syndication (RSS) feeds through iTunes. Corporate security is enforced in the background, only allowing access to those authorized.

The user interface provides a button on the home screen to access Sun Learning. Once within the application, there are buttons to access new content, hot topics, specific categories, search and personal settings.

Additionally, Sun Learning has set up a web site for users to contribute their own content. Upon upload, the content is automatically encoded and tagged.



## Microsoft Corporation

Microsoft's Sales, Marketing, & Services Group (SMSG) Readiness team has recently deployed a pilot project of mobile courses, and more. They have extended mobile options to include access to product reference materials through secure mobile connections, to voice "DriveTime" broadcasts, and to updated product information through an interactive voice response system.

## 3Com

3Com needed to supply training and performance support to internal and external personnel and customers. The solution they arrived at was to use Palm mobile devices to deliver learning modules on demand. The devices, called 3Com University Learning Assistants, have features such as simple navigation, the ability to bookmark your position in learning modules, favorites lists, knowledge checks, graphical capabilities, and tools to update and synchronize learning modules.



## Valero Energy

On the subject of just-in-time information and mobile performance support, Valero Energy conducted a pilot study several years ago which involved the use of mobile devices for quality inspections in the field. Employees were given handheld devices loaded with the Microsoft Windows operating system and a touch screen interface. These devices, which were also loaded with all the necessary documentation for quality inspection procedures, also contained all relevant forms to be filled out using a handheld slate-oriented device. Further focus has been placed on loading the same content and functionality onto smaller PDA devices. This allows learning and support to be delivered exactly when the employee needs it, and solves the problem of support when out in the field away from a PC.

## iPods in the Corporate Arena

With the ubiquitous nature of the iPod family of products, companies are looking at podcasts as a way to defray training costs and modernize the training process. Financial giant **Capital One** even goes as far as handing out iPods to employees enrolled in training sessions. This change from classroom to personal education arose from the lack of time during the workweek to physically attend training. This audio equivalent, which allows employees to use it when and where they desire, seems like the logical answer to this dilemma.



The initial test ran for 30 days, during which employees expressed their preference toward iPods. “They [the employees] were able to multiply their time, and they gained learning that they wouldn’t have been able to get in the classroom,” said Michael Walker, manager of learning services administrations at Capital One University.

One of the first podcasts offered was a leadership development course along with a talk by Capital One executives, as well as an audio article about leadership from the Harvard Business Review. New employees were also given *Nickel and Dimed* by Barbara Ehrenreich (which details the adversities faced by low-wage earners and their day-to-day struggle for survival).

Matt Schuyler, the Capital One executive vice president of Human Resources, says the early measurements of audio learning program effects have been positive. “Their productivity is up, so literally, we’re making more revenue and income with fewer employees.” The receipt of an iPod, he says, could also spark employee enthusiasm. He also says iPods are just the beginning. “Picture your PDA or your cell phone being able to receive curriculum from us,” Schuyler states, adding, “It’s just a few years away.”

**Homewood Suites by Hilton** furnished video iPods to their 5,000 to 6,000 employees at 204 locations across the United States and Canada for a new mobile training program. Training content is organized into playlists for use in on-the-job coaching and guidance. There are a variety of two-minute modules highlighting specific brand skills, which will be updated as needed.

In the summer of 2006 **National Semiconductor Corporation** gave each of their 8,500 employees a 30-gigabyte video iPod. These iPods were for employees to download National training podcasts and other employee communications.

## Commercial Learning Content for iPods



Commercial aggregation content sites for Podcasts and other mobile learning are becoming more commonplace. Sample sites include the following.

The **Culinary Institute of America** offers video iPod ProChef Podcast Training. The video training not only allows for training on-the-go, but the ability to train live in foodservice operations or also in the kitchen.

**LiquidTalk** targets mobile staff productivity with their audio and video business content for the iPhone, iPod and BlackBerry. Their content is focused on mobile sales enablement, learning and training, knowledge transfer, corporate and customer communication.

**Total Training Network** (TTN) has compiled over 300 of the best programs from over fifty vendors. TTN's entire library of training courses is available in both audio and video formats on an easy to use, portable device. The courses have been organized on the iPod using Curricula (Playlists), Subjects (Genres), Faculty Name (Artists), and Course Titles (Songs / Movies).

## Higher Education

Significant pilots have been conducted with mobile devices at institutions like Wake Forest and Duke University and for specialized disciplines like law and medicine. At a number of universities such as Stanford, Duke and about 65 other schools iTunes University is up and running. Faculty are delivering some of their audio and lecture-based content through that conduit.

### Abilene Christian University

Abilene Christian University (ACU) in Texas will be the first university in the nation to issue an iPhone or iPod Touch to all incoming freshmen beginning in the Fall 2008.

This innovative learning experience will be closely followed to see how these converged media devices will be incorporated into both the classroom and the daily mobile life of the faculty and students.



### Montclair State University

Montclair State University Campus Connect is a relatively new initiative that was initially created for communication purposes, but is beginning to add learning support. All incoming students receive a GPS-enabled phone as part of their tuition/fees. The phone has been preloaded with tools for learning, safety, community, and campus navigation.

### Wake Forest MobileU

Wake Forest was one of the first college campuses to implement a program that uses Pocket PCs and other mobile technologies to extensively connect and improve students' academic and social lives. MobileU started as a pilot in 2005 and was tested initially by a group of Chemistry students, students in the Tech House, and a group of volunteers from the student body.



Sprint, AT&T, IBM, and the computer science department have provided applications for the devices, including basic voice and data plans, Wi-Fi connections across campus to access information, and voice-driven programs that give the status and whereabouts of various amenities on campus. MobileU uses IBM's WebSphere "Everyplace Multimodal Environment" to geolocate the campus shuttles and get estimated time of arrivals and also to find out which laundry machines are unused, instead of checking back and forth in person waiting for one to free up.

The program continues to grow in its testing phases with hundreds of people now volunteering to participate, more applications being developed, and more devices and options being created.

## Duke University

In 2004 Duke University supplied original iPods to faculty and incoming freshmen. The program was “to be continued” and turned into an ongoing project to broaden the usage and methods of learning including mobile technology at Duke. Other phases of the project have come to include collaboration with Public Radio International (PRI) to provide radio reports as supplements to Duke’s courses, and the distribution of Hewlett Packard Tablet PCs to different departments. They have learned a lot since the start and now report that “the use of portable digital recording and portable audio playback have become routine technologies for teaching and learning at Duke.”



Duke University has devoted an entire department to integrating mobile technology into many of its classrooms, curriculums, and knowledge sharing. The Duke Digital Initiative (DDI) has enabled students to gain access to equipment such as ultra mobile tablet PCs, and allowed them to use their own technology (such as Apple iPods and cell phones) to listen to class podcasts, be contacted via text messages about school alerts, and to access Webcasts that update students about new and upcoming features to the DDI.

Furthering the partnership with Apple, Duke is one of the first universities to customize iTunes to distribute lectures, symposiums, class materials, school news, and of course, music. The program is called iTunes U and enables faculty and students to make/take course materials with them on their iPods using Apple’s simple and popular interface. Courses have made extensive use of iTunes.

## Podcasts, iTunes University

Apple Inc. continues its long-standing efforts to work with schools to enable educators to use a more mobile approach to learning. Their iTunes U service is hosted free of charge (the schools maintain the content) so that faculty can distribute audio and video resources such as lectures, and students can share their own work such as independent music and podcasts. Even the sports department is using the service to archive the recording of football games and sporting events.

There are currently over 50,000 educational audio and video files available from top universities, museums and public media organizations from around the world.

Those who still do not have iPods or compatible MP3 players can still use iTunes and listen to the materials burned to a CD or played on their computers.

## International Academy of Design & Technology (IADT)

International Academy of Design & Technology Online furnishes to students with mobile devices the capability to login and access many of the core features of the IADTOnline virtual campus. Capabilities include access to course podcasts, course videos, school mail, class assignments, individual grades, and faculty information. Classroom On the Go compatibility is available for over two hundred mobile devices.



## K-12

K-12 education has been slow and is still more focused on laptops for kids than other mobile devices. Many schools do not allow cell phones to be used in any way in the classroom, even into high school. But because of the potential for incorporating learning applications, some school districts and associations have been lobbying to remove these regulations and to make mobile learning devices accessible as yet another learning channel.

### New York City Public School's Million Project

New York City schools have been in the news for disallowing cell phones in schools. Parents challenged this, but the courts upheld the rules. At the time of this writing, there is an interesting proposal on the table by an advertising executive to the NYC Department of Education to provide one million cell phones to students in the public school system. The phones would contain such tools as a thesaurus; spellchecker and an extra-help tip line for each student. Rewards and incentives such as downloads and additional minutes would be given based upon the use of these tools, achievements and attendance. The plan is to have the voice and text features shut off during school hours. A pilot project for 2,500 students occurred in the spring of 2008 with marked improvements noted in achievement, engagement, attendance, discipline, punctuality, grades and morale.



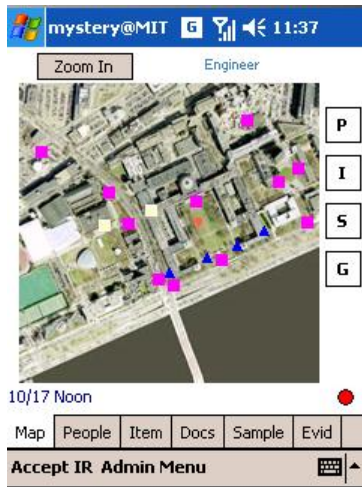
### My Sports Pulse



My Sports Pulse — a joint endeavor between the University of Central Florida (UCF) and the Ewing Marion Kauffman Foundation — is currently delivering sports-themed scenarios to middle and high school students via mobile devices. UCF's Institute for Simulation and Training designed and developed the program to utilize cutting edge technology, thematic interest, and celebrity athlete presence in order to increase student achievement and interests in STEM (science, technology, engineering, and math) disciplines. The program is set up to pilot in five different geographic locations around the globe (the United States, Sweden, United Arab Emirates, Singapore, and Uganda) followed by a broader public launch.

Students receive a scenario — via SMS (Short Message Service) or IVR (Interactive Voice Response) — with setup information about a scientific, mathematical, or engineering principle grounded in a sports, fitness, or nutrition context. Students then receive five questions related to each scenario and accumulate points in five distinct categories for answering correctly. These points are used to build a virtual avatar in the form of a fantasy athlete — a dynamic representation of students' performance in the program. Students receive milestone incentives (such as ringtones, tickets to sporting events, celebrity athlete visits, etc.) as well as the chance to win a trip to major sporting events (such as the European Cup in football or the 2008 Beijing Olympics).

## Augmented Reality Games for Handhelds (ARGH)



The 3-year ARGH (“Augmented Reality Simulation Games for Mathematics and Literacy Learning with Emerging Mobile Technologies”) project started as a collaboration among The Local Games Lab at the University of Wisconsin System’s [Academic Advanced Distributed Learning Co-Lab](#), [Games, Learning, and Society](#) program at the University of Wisconsin-Madison, [Harvard Graduate School of Education](#), and the [Teacher Education Program at MIT](#). By way of the U.S. Department of Education’s “Star Schools Program,” children are invited into a workshop where they learn science, math, and reading skills to solve augmented reality games.

The ARGH games are played with a handheld device or PDA connected to a GPS device. Students carry PDAs as they walk around in the real environment. As they do so, the PDA displays items such as photos, video clips, text documents, and statistics. These items, which appear on the PDA, are triggered when players walk near pre-determined GPS positions. (It is interesting to note that even though a cell phone could be used at a potentially lower cost, their usage was not allowed by the schools.)

By having students learn and play in this fashion, they are more engaged than if they were in a traditional classroom environment. They learn teamwork, and also get a beginning look at how professionals in the real world operate. The ARGH project is also investigating other age ranges with a series of games designed around science, problem solving, history, economics, plus a variety of other topics.

## Government

The military and government is starting to fund mobile options more heavily and to look at research into both wearable computing and ways this can be used for knowledge management and for just-in-time learning applications. The Department of Education has been funding this same area, as has the NSF (National Science Foundation), to look at new ways mobile devices can be used for learning applications.

### U.S. Army 10th Mountain Division

Vcommunicator® Mobile LC created by Vcom3D, Inc. has developed language avatars which operate on a video iPod for soldiers to use in one-way communication with the local population. Iraqi Arabic and Kurdish language and culture training are available for the US Army's 10th Mountain Division in Iraq. Pashto and Dari dialects will be available for use in Afghanistan.



## ICT Army Excellence in Leadership

The USC Institute for Creative Technologies has created the Army Excellence in Leadership (AXL) project that focuses on accelerating leadership development. "AXL provides an engaging and memorable way to transfer tacit knowledge and develop critical thinking through case-method teaching, filmed storytelling and interactive training."

The Hollywood quality videos are combined with questions and an opportunity for reflection and analysis. The leadership content has been delivered on the web and is now being piloted on the iPod touch and iPhone.



## National Institute of Justice

The US National Institute of Justice has been using iPods and iQuiz for training and assessment. Their recent initiatives include forensic training podcasts accessed through Really Simple Syndication (RSS) feeds. Content is made available in various formats including text, audio, images and video for delivery to multiple mobile devices.

## Secure Mobile Devices for the Military

The National Security Agency finalized testing for secure mobile environment personal electronic devices from General Dynamics C4 Systems and L-3 Communications. Using these Windows Mobile devices, secure access and communications will be available. The Sectera<sup>®</sup> Edge<sup>™</sup> device offers both classified and unclassified USB (Universal Serial Bus) ports and PDA keys, a card reader, and interchangeable GSM/CDMA/Wi-Fi capabilities.



## Considerations

Discussions about deploying mobile learning also need to focus on both development and deployment and the various opportunities and challenges.

## Tools

Although deploying learning content for multiple devices is not without some challenges, there increasingly are tools available to make this process easier. Those organizations with standardized deployment of mobile devices definitely have a much easier time. Development tools from established vendors such as Adobe offer templates and tools available for mobile, as well as testing tools. XML-based Learning Content Management Systems (LCMS) are also making mobile deployment options available for existing eLearning content.

New and old companies continue to fill the specialized voids in mobile development and delivery. The ultimate goal for most development organizations is to develop once and deploy everywhere, but we are not quite there yet. Vendors such as Giunti Labs and Instancy are moving quickly in that direction.

With the increasing capabilities of mobile browsers and the deployment of Flash on mobile devices, some content initially created for desktop or laptop eLearning is now also being deployed on mobile devices. Your learning content may already operate on some mobile browsers. You might want to try it on the mobile content test site at <http://mr.dev.mobi>.

Authoring tools such as ToolBook have announced support for delivering to the iPhone with other platforms to follow. In addition to Flash support, look to see support for Microsoft's Silverlight on mobile devices with the announcement by Nokia of Silverlight support.

## Issues/Challenges

The main challenges and concerns regarding mobile deployment still include screen size, battery life, costs, and security. With new device models and increased competition, these items continue to improve.

As with any new technology you integrate to support learning in your organization, several challenges and outstanding questions can get in the way of quick and successful implementation. The top three implementation challenges that the MASIE Consortium contacts have identified are limited resources, organizational acceptance, and access to mobile devices. Several outstanding questions remain:

- How do we best track/measure information that is sent and received? What, how and how much mobile information do we track? Why track certain information? How do we track impact?
- How do we integrate mobile learning into an LMS?
- How do we determine whether a mobile device is the right tool for a particular objective?
- Will the mobile tool be truly usable and practical?

Security also needs to be addressed through both policies and training. Pointsec reports that in the last six months of 2006, roughly 12,000 smartphones and other mobile devices were left in cabs in the San Francisco and Washington DC locations. It is highly recommended that training organizations work closely with their Information Technology departments from the beginning of any mobile learning projects.

## The Future

Although we continue to work with the tools and technologies available today, as researchers we also need to continue to follow and explore future capabilities for having access to information and communication methods available to us anytime and anywhere. And at the same time, not forgetting the basics, such as voice and text, and how they are most effectively used to improve learning in a mobile society.

There is hope for less control by the US carriers with Verizon Wireless being the first to announce opening their network to all mobile handsets and Google forming the Open Handset Alliance, a group of more than 30 technology and mobile companies, and developing Android, open, and free mobile platform. Additionally there was a recent announcement



that Nokia is buying the Symbian Operating System and pledges to make Symbian open source under the royalty-free Eclipse Public License, going head-to-head with Google. The new alliance, called the Symbian Foundation, includes Nokia, Sony Ericsson, Motorola, AT&T, and Vodafone.

We continue to explore:

- Location aware learning
- Point-and-shoot learning with camera phones and 2D codes
- Near Field Communications (NFC) secure transactions
- Sensors and accelerometers in mobile devices in behavioral based learning (We continue to follow and dialog with companies such as Fullpower.com in Santa Cruz, California.)
- Mobile content creation (including user generated content)
- Games and simulation for learning on mobile devices

While the future may look uncertain, uncertainty breeds innovation. Our lack of standards (or maybe too many competing standards) lower mobile phone penetration, while new gadget and service addiction may drive us to new heights. For instance, in the US, we have 7.2 Megabits/second speeds available on our mobile phones (using a High Speed Downlink Packet Access (HSDPA) network)! That is about the speed of 5 cable modems or DSL lines all on your mobile phone! Right on its heels are mobile broadband solutions like WiMAX and Femto cells that can provide speeds and common access to Wi-Fi as well. With more people still choosing their phones and services, there is room for leapfrogging to new technology and carrier consolidation like the purchase of Alltel by Verizon Wireless. Finally, our obsession with the latest and greatest will have a certain portion of our population continually chasing the newest phones and applications and paving the way to financial success for those companies that choose to innovate. An example is the carrier churn between services like those seen in mass migration to AT&T upon release of the first iPhone.

Best of all, there is a long history of taking new technologies and turning them into commercial applications that translate into successful businesses that meet consumer's needs. We see pent up demand for education, learning and performance solutions and the technologies to make these a reality. If and when these trends will align perfectly with supply and demand is anyone's guess, but smart money will be on the creativity, flexibility and dynamism that can come from anywhere in the world, but can be translated to utility in a wealthy market capable of sustaining innovation as is the case here in the US.

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