

# *The Future of Mobile Learning: Empowering Human Memory and Literacy*

**Danielle M. Villegas**

---

## *Introduction:*

---

Mobile learning, also known as “m-learning”, is a convenient, current day means of delivering informational content to learners using current mobile technology devices. With the fast emergence of mobile technology proliferating in modern society, m-learning has presented an opportunity to those in the electronic learning (e-learning) field to establish and promote best practices with instructional design with special consideration for the concepts of human memory and literacy. Because of the screen size restrictions and means of everyday use of mobile devices, methods need to be developed to allow for smaller chunks of information to be delivered for better retention and promoting informational literacy.

Since humans have a limited capacity to remember and yet have a need to learn and retain information, learning in small doses allows for better information retention. This brings to mind how early humans originally learned and retained information in the early days of orality and literacy, and ties into the current needs to promote literacy via m-learning. Instructional design for m-learning is tied to presenting information in smaller doses, thus lending itself as a credible learning format. I will be tying together how early efforts to create and promote literacy are tied to e-learning and how technology helped the evolution of that process, explain the basic concepts behind m-learning practices and instructional design, and provide evidence of efforts now being done to revise how m-learning is conducted on smart devices through current thought in the m-learning industry I will also explain the foundation of m-learning curriculum practices in current thought I intend to demonstrate how m-learning harkens back to the basic foundations of early literacy as a natural progression in the evolution of information literacy over traditional e-learning practices, and why this methodology needs to be adopted as the first method of design now when creating an m-learning course curriculum.

## *Orality and Early Literacy*

---

In the early days of human culture, orality and early literacy needed to develop. Walter Ong elaborates on the history of this evolution in his book, *Orality and Literacy*. The first part of this evolution was for a human in an oral culture to understand how to retain verbalized information, especially for recalling the solution to a complex problem, especially if the explanation was particularly lengthy. Ong explains,

In the total absence of writing, there is nothing outside the thinker, no text, to enable him or her to produce the same line of thought again or even to verify whether he or she has done so or not...But even with a listener to stimulate and ground your thought, the bits and pieces of your thought cannot be preserved in jotted notes. How could you ever call back to mind what you had so laboriously worked out? The only answer is: Think memorable thoughts. In a primary oral culture, to solve effectively the problem of retaining and retrieving carefully articulated thought, you have pieces of your thought cannot be preserved in jotted notes. How could you ever call back to mind what you had so laboriously worked out? The only answer is: Think memorable thoughts. In a primary oral culture, to solve effectively the problem of retaining and retrieving carefully articulated thought, you have to do your thinking in mnemonic patterns, shaped for ready oral recurrence. (Ong 33-34)

In order to overcome this problem, the technology of writing was created. This was important because it allowed human thought to be retained and trigger memory. Ong points out, “Without writing, the literate mind would not and could not think as it does, not only when engaged in writing but normally even when it is composing its thoughts in oral form. More than any other single invention, writing has transformed human consciousness” (Ong 77).

This is not to say that the invention of writing was greeted with wide open arms. Plato’s Socrates urged that writing destroyed memory and weakened the mind, and that writing was passive because it did not allow for the give-and-take of natural speech, much like a computer today. (Ong 78) Ong even cited Renaissance-era editor Hieronmino Squarciafico, who in turn argued in 1477 that with the invention of the printing press and the proliferation of literacy, “The abundance of books makes men less studious” (Ong 78).

## *Technology and writing*

---

To understand the importance of literacy and how it pertains to memory and further to the tenements of m-learning, we have to understand how technology plays a part of literacy and how it affects educational thought. Ya, Hao and Hobbs explained it best as follows:

Historically, there are three major types of learning systems on the basis of what medium is used in connecting learners with learning objects. The first learning system can be called S-learning, using speech as its primary medium to promote learning. Its prominence was gradually replaced by *P-learning*, the second learning system that uses paper as its primary learning medium. *E-learning* [became] a pervasive and important learning phenomenon in the 1990s and can be considered the third learning system that uses the electronic technology as its primary medium of human learning....S-learning, P-learning and E-learning essentially supplement or support each other rather than reject or replace the other. With three different types of

---

## Understanding e-Learning and learning objects

medium (speech, paper, and electronics), however, these three learning systems differ from each other distinctively in how knowledge is presented, preserved, and/or delivered and how a learning process takes place (e.g., speed, timing, space, efficiency, and accuracy). (Ya, Hao and Hobbs 286)

Ya, Hao and Hobbs continue to point out that e-learning is not only a “psychological phenomenon”, but it also concerns itself with how people improve their learning using technology. “Thus, there is a need to study people’s psychological factors, . . . process, . . . and mechanisms . . . that underlie E-learning so that E-learning practice can move from technology-centered implementation to human centered effective learning processes.” (287)

## *Understanding e-Learning and learning objects*

---

A key part of understanding e-learning is to show how it relates to the distribution of information to learners. Mayra Aixa Villar summarized the learning experience well when she wrote,

When developing learning solutions, we sometimes tend to concentrate too much on the learning outcome. The key aspect of a learning experience should not only be “what learners need to learn” but also “how they are going to learn it”. It is the types of interactions between the content and the learner that constitutes, in fact, the process of learning. . . . Usefulness has to do with “solving a problem through the right set of functionality at the right time”. Usability is related to a user-friendly interface where the learner can move smoothly and naturally and meaning relates to a functionally-sound use of visuals so as to allow for an effective usability. (Villar)

This is crucial to how well e-learning has integrated into current curriculums. E-learning has been around for as long as computers have been mainstreamed--about thirty years or so. Because computers can hold vast amounts of information in one place, the amount of data available is overwhelming. We need only to see a small portion of that vast library at a time. J. David Bolter said, “What we have today is a view of knowledge as collections of (verbal and visual) ideas that can arrange themselves into a kaleidoscope of hierarchal and associative patterns—each pattern meeting the needs of one class of readers on one occasion. (Bolter 90)”

With such large amounts of information to be available and to be learned, it became evident quickly that instructional design had to take steps to make e-learning accessible to learners. “Learning objects” were developed as a result. The concepts behind learning objects was simple enough—use small amounts of instructional content that can be reused, and was based on object-oriented programming. Steven R. Yacovelli described learning objects as “an object or small section of content designed for a specific purpose (in this case, to aid the learning process) and that can be organized using what we are called metadata, or ‘data about data’ (Yacovelli 17).”

Yacovelli characterized learning objects as follows:

- Small ‘chunks’ of instructional material
- Catalogued by metadata
- Reusable by design
- Digital in format (Yacovelli 18-19)

---

### **M-learning takes off**

He further pointed out that “[l]earning objects are not a ‘fad’ by any stretch of the imagination (22)”. Tanya Elias, in fact, described eight principles of universal instructional design for use with e-learning and learning objects to further this concept, which are the following:

1. equitable use,
2. flexible use,
3. simple and intuitive,
4. perceptible information,
5. tolerance for error,
6. low physical and technical effort,
7. community of learners and support, and
8. instructional climate (Elias 147)

The ability to have large amounts of information broken into chunks that could be reused again and again through the use of computers allowed e-learning to be a great option in providing flexible and easy-to-use data on an equal level with all students. Learning management systems developed in order to accommodate building courses and curriculums over the decades, and those foundations are still in use today in online courses. Learning objects could be anything—a video, an audio podcast, text—as long as it could be used again in as many different contexts as possible in a manageable way and obtained through standalone and online applications.

However, over the decades, some of that original objectivity in designing e-learning courses dwindled a bit. The Internet helped expand the choices of learning objects available through the YouTube website and other audio-visual-type multimedia, but many courses became oversimplified with long audio and video podcast lectures and glorified PowerPoint slide presentations, with little interactivity among students, despite the availability of email and online discussion forums.

Within the last decade or so, things have started to change. First, the proliferation of mobile technology has changed the game. No longer are learners stuck at a desk hooked up to a computer for hours on end reading text and limited to whatever is presented solely on their desktops and laptops. As Oksana Hlodan explained, “Any technology that connects to wireless or mobile phone networks can [and] accesses Web-based public or private services can be used...[E]xamples include smartphones, PDAs (personal digital assistants), handheld gaming devices, netbooks, and specialty technologies such as those used in science labs” (Hlodan 687). Second, along with this mobility came the Web 2.0 movement, which has seen the use of social media becoming boundless and mainstream in a very short amount of time. This has allowed for more people to become connected to each other anytime, anywhere and have unlimited access to the Internet’s cornucopia of information at their fingertips. While smartphones made the initial mark with m-learning, it is with the advent of the iPad that m-learning truly started to emerge.

### *M-learning takes off*

---

Mobile technology has spawned a way of accessing information more easily than ever before. Due to the inherent characteristics of mobile technology, it has been generally accepted that m-learning is how e-learning needs to grow and evolve. But there are those who question whether m-learning is a fad, or if e-learning on mobile devices is even appropriate. With that in mind, one needs to analyze and assess the positive outcomes of utilizing m-learning, and what obstacles stand in the way of m-learning.

---

## M-learning takes off

Judy Brown, a renowned m-learning strategic analyst, wrote that a conversation on m-learning should begin with the question of when m-learning is appropriate. She uses Conrad Gottfredson's Five Moments of Learning Needs as a reference tool to start the conversation. Those moments of learning needs are identified by determining if m-learning is appropriate:

- When learning for the first time?
- When wanting to learn more?
- When trying to remember?
- When things change?
- When something goes wrong? (Brown 29)

The initial implication when this conversation begins is that m-learning is merely the transference of e-learning onto a smaller device, which doesn't always seem practical. Many misconceptions have been brought forth regarding m-learning, such as thinking that learning on a phone is not a good idea, the small screens are too limiting, programming for mobile devices is costly, everything is solely centered around content, it only works when it's connected to the Internet, it always has to be interactive, and that it's limited to smartphones. (Quinn 28-29) While there is some validity to some of these issues, it's simply not true. Instructional designers and e-learning specialists who are programming for m-learning need to merely make adjustments in formatting and adapt to using additional tools and features found on mobile devices that aren't as easily available on a desktop or laptop. If anything, m-learning is more flexible than e-learning because of its mobility. The other thing to keep in mind is that due to how these desktops and mobile devices are used, in many cases, it's like comparing apples to oranges. Both are fruit, but have different characteristics and are used differently. You can eat raw or make juice with either of them, but one wouldn't make an orange pie, nor would a person be able to stab a straw into an apple to drink the juice. There will be similarities between e-learning and m-learning, but there will always be differences, and thus adaptations to accommodate each. Judy Brown pointed out the following in this regard:

There are differences between mobile learning and e-learning. Mobile learning is generally shorter in duration and designed for instant use. It can be personalized and include data collection or user-generated content. Mobile learning is not about the devices, but the capabilities. It's about the experience, not the technology... Effective usage can bring us closer to improved personalized learning by delivering the right materials to the right person at the right time and place. (Brown 28)

John Traxler also explained that the main difference between e-learning and m-learning is that "mobile learning can emphasize those unique attributes that position it within informal learning, rather than formal learning. These attributes place much mobile learning at odds with formal learning... This raises concerns for the nature of any large-scale and sustained deployment and the extent to which the unique attributes of m-learning may be lost or compromised." (Traxler 1-2) It's something to keep in mind when analyzing m-learning's place in education.

So what makes m-learning such a great tool to help advance our memories and our literacy? As Judy Brown pointed out earlier, it's the capabilities of mobile devices that allow for this to happen, on both a technological level as well as on a theoretical level.

## *M-learning Technology*

---

While m-learning is not the technology use itself, it is the technology that allows m-learning to happen. As technology changes, m-learning adapts with it. For now, it's important to understand the current capabilities of the technology itself.

Mandeep Singh pointed out in 2010, "Six in ten people (more than 4 billion individuals) around the world carry a powerful computing device in their pockets and purses. They don't realize it, but today's mobile phones have the computing power of a personal computer from the mid-nineties, while consuming a fraction of the energy and are made at significantly lower cost." (Singh 69) Smartphones, tablet computers (such as an iPad), and e-reader devices (such as a Kindle or Nook) are considered the leading devices used for m-learning. However, audio devices like MP3 players, audio-video devices like the iPod Touch, and portable game devices like the Nintendo DS can also be used as m-learning devices. Even cell phones without the features of a smartphone can be considered an m-learning device. Why? Each of these devices provides the obvious—mobility—and a means of being able to share educational content. Whether an audio podcast is downloaded to an MP3 player, an old-style cell phone receives text/SMS messages to receive content or share ideas with other students, or an e-book is being read on an e-reading device, m-learning is in play.

There are several tools that can be used in m-learning. Tools most often used in e-learning settings include using e-mail, video conferencing and instant messaging to communicate, standalone programs such as Acrobat Reader or custom curriculum based programs, desktop publishing and word processing programs, and the use of internet browsers to connect to servers with learning content and for research. Over many years of use, all of these tools have been used successfully in the e-learning industry to teach learners. These tools are all also present on many mobile devices, predominantly on smartphones and tablet computers.

However, mobile devices provide a convenience that desktops can't—the devices can be wherever the user—or learner—is. How convenient is it that people can be reading an article or text for class on a mobile device while on a train commute, or simply away from their home? If internet connectivity is available through wireless connections (such as data networked or Wi-Fi) or cell phone connectivity is available, messages—sometimes known as "push technology"—can be sent through instantly by video messaging, text/SMS messaging, social media, or even simply a phone call. Cameras within a mobile device that allow video and still photography can offer moments to instantly capture objects to study or events as they happen. Global positioning systems, or GPS, within a phone can provide data and information to help learners relate to the world around them. Notes and lectures can be written and recorded by audio devices and word processing-type applications while in a classroom environment then later reviewed within those same applications later when the learner returns home. Connectivity to a browser when on-the-go can help a learner assess a concept wherever he or she may be—the browser acts as a digital library that's always on-call. The tools commonly available on both a desktop and a mobile device in conjunction with the additional tools and the sheer feature of mobility itself make mobile devices ideal for m-learning.

There are some challenges in using mobile devices as learning tools, however. These obstacles include the following:

- Device Variability
- Slow download speed and limited Internet access
- Small screen sizes with poor resolution, color, and contrast
- Awkward text input

---

## M-learning Theory

- Limited memory (Elias 145-146)

Despite these obstacles, m-learning is seen as the key to future learning. As mentioned earlier, mobile devices are incredibly prolific worldwide, more so than even having a laptop or desktop computer, so the opportunity to take advantage of the technology that is most commonly on hand and available needs to be utilized as best as possible.

## *M-learning Theory*

---

Agnes Kukulska-Hulme has said, “As mobile technology becomes more pervasive, the question arises as to whether it can enable learners to demonstrate or develop [the traits of learning attributes, skills and competencies]. One way to approach this question is to look at how learners are already using their personal mobile devices for life and learning, to see if there is any match between the nature of these mobile device uses and the characteristics that educators wish to promote.” (Kukulska-Hulme 6) This is a fair question and this idea is at the center of m-learning discussion within the field right now. What is the best way to deliver content effectively in a way that allows for learners to be able to actually learn and retain information using mobile devices?

First, as pointed out by Kukulska-Hulme, we have to understand how learners use mobile devices, and understand the environments when m-learning is most practical and efficient. It is not only the physical limitations that limit learning, but also the time and circumstances of when the learner would be using a mobile device. For example, it might not be practical to have a two-hour video podcast of a lecture for use in an m-learning curriculum. It is not that it can't be done, but it isn't often practical. Additionally, many mobile learners use their mobile devices more often as reference guides while on the run. The time to read long e-publications while on a job site or in-between meetings isn't practical as well. Yeonjeong Park correctly validates this point and the difficulty of making the transition from e-learning to m-learning among educators, by saying, “Despite the great potential mobile learning has and the innovative development of mobile technologies, a theoretical framework in which to review diverse mobile learning projects in the context of distance learning has been lacking. The framework for analysis was adopted from transactional distance theory and modified by adding a new dimension to reflect the characteristics of mobile technologies that support both individual and social aspects of learning” (Park 95). With mobile technology's rapid emergence, it has been very difficult to keep up the pace to come up with best practices and a benchmark for mobile curriculums.

It is at this point, however, that m-learning specialists agree that bringing those original learning foundations of learning in small chunks—using those learning objects—becomes a major factor in developing effective m-learning. Mohammed Ally elaborated on this idea saying, “[The] major challenge for educators and trainers is how to develop learning materials for delivery on mobile devices. The learning materials should be in manageable learning chunks and should make use of multimedia. One approach is to develop the learning materials in the form of learning objects and then link them to form a 'learning segment'. There are many advantages of using learning objects in mobile learning delivery including: they can be re-used and changed without affecting other learning objects, and they can be stored in an electronic repository for remote access at any time.” (Ally 281)

Tanya Elias created a table to assist with better understanding of how m-learning takes the e-learning processes a step further with the capabilities of mobile devices. In Table 1 below, she shows her recommendations of how to include universal instructional design (UID) principles that were mentioned earlier in this paper to online distance education (DE) (usually associated with traditional e-learning) in comparison to m-learning recommendations:

## M-learning Theory

**TABLE 1.**  
**UID Recommendations for Inclusive M-Learning (Elias 148-149)**

UID Principles	Online DE Recommendations	M-learning recommendations
1. Equitable use	<ul style="list-style-type: none"> <li>put content online</li> <li>provide translation</li> </ul>	<ul style="list-style-type: none"> <li>deliver content in the simplest possible format</li> <li>Use cloud-computing file storage and sharing sites</li> </ul>
2. Flexible use	<ul style="list-style-type: none"> <li>present content and accept assignments in multiple formats</li> <li>offer choice and additional information</li> </ul>	<ul style="list-style-type: none"> <li>Package content in small chunks</li> <li>consider unconventional assignment options</li> <li>Leave it to learners to illustrate and animate courses</li> </ul>
3. Simple and intuitive	<ul style="list-style-type: none"> <li>simplify interface</li> <li>offer offline and text-only options</li> </ul>	<ul style="list-style-type: none"> <li>Keep code simple</li> <li>Use open-source software</li> </ul>
4. Perceptible information	<ul style="list-style-type: none"> <li>Add captions, descriptors and transcriptions</li> </ul>	
5. Tolerance for error	<ul style="list-style-type: none"> <li>allow students to edit posts</li> <li>issue warnings using sound and text</li> </ul>	<ul style="list-style-type: none"> <li>scaffold and support situated learning methods</li> </ul>
6. Low physical and technical effort	<ul style="list-style-type: none"> <li>incorporate assistive technologies</li> <li>consider issues of physical effort</li> <li>check browser capabilities</li> </ul>	<ul style="list-style-type: none"> <li>use available SMS readers and other mobile-specific assistive technology</li> </ul>
7. Community of learners and support	<ul style="list-style-type: none"> <li>include study groups and tools</li> <li>easy-to-find links to support Services</li> </ul>	<ul style="list-style-type: none"> <li>encourage multiple methods of communication</li> <li>group learners according to technological access and/or preferences</li> </ul>
8. Instructional climate	<ul style="list-style-type: none"> <li>make contact and stay involved</li> </ul>	<ul style="list-style-type: none"> <li>push regular reminders, quizzes, and questions to students</li> <li>pull in learner-generated content</li> </ul>

As we can see, most of the same e-learning concepts were still adhered, but adjustments were made to adapt to m-learning.

The other part that has been a result of analyzing m-learning is the ability to promote and enhance learner interaction. Based on this interactive concept, Yuhsun Edward Shih looked at the learning cycle of Keller's ARCS Model of Motivations of attention, relevance, confidence and satisfaction (ARCS) to come up with his own variation entitled "Shih's Mobile Learning Model" to support instructional design for m-learning. Shih supports what Ally recommends regarding multimedia, and further recommends the following for inclusion in m-learning curricula:

1. Sending a multimedia message to mobile phones to trigger and motivate learners
2. Searching the Web for relating information by using embedded hyperlinks (URLs) in the message received in the phone
3. Discussing with learning peers by text, voice, picture or video messaging
4. Producing a digital story telling of what they learn by audio or video diary (mob blogging journal)
5. Applying what they learning the simulated environment, such as online educational gaming (Shih and Mills 5-6)

By utilizing the capabilities of a mobile device as Shih suggests, the possibility of increased activity will allow for deeper learning.

## *M-learning Implementation*

---

Since this type of thinking in instructional design is still relatively new and the technology of mobile devices improves continually, there are not many studies completed to date that can concretely verify that m-learning is better than e-learning. However, there are enough studies and other observations that have been done to show that there is strong anecdotal evidence that m-learning does have its benefits.

An example of this is detailed in a 2009 article in *Training* magazine about a global management consulting company called Accenture which had begun to deliver m-learning. The learning architect at Accenture, Dana Koch, explained that the company was having difficulty in reaching their senior executives, saying, “They know how important training is, but they are so busy that it’s difficult for many of them to squeeze out 40 or more minutes at a time to complete the courses.” (Boehle 30) However, it was discovered that executives did have five to ten-minute spans of availability dispersed throughout their day, so Koch’s team took advantage of that downtime to provide them with m-learning options that provided the convenience the executives needed to allow them to take their required coursework. It was also spelled out in the article that “[i]nternal surveys revealed that 92% of those surveyed would ‘jump at the chance to use their mobile devices for training’, and prefer it in 10-15 minute chunks, and half preferred a downloadable option for mobile courses so they could use w/out connectivity” (Boehle 33) Koch also was quoted as explaining an important aspect of the instructional design of these mobile courses, namely chunking content within modules in ways that worked for the learners. She said, “We used the same content and mimicked the modules in our online courses, but in a way that was conducive to a smaller screen....If a learner only has two minutes or 12 minutes to spend on the course, he can stop his learning session at a time that’s convenient for him and then come back in later on and take up exactly where he left off. The timing of the “chunks” is defined by learners’ (Boehle 33).”

M-learning also works well in the academic world as well, as evidenced by many academic journals and other educational resources detailing more anecdotal evidence in its favor. Recently, the Consortium for School Networking released a report called, “Making Progress: Rethinking State and School District policies Concerning Mobile Technologies and Social Media” in which the report recommended a “Bring Your Own Technology” policy, wherein “[t]he report advances the once revolutionary and now widely accepted premise that our schools...should actually integrate the use of these devices and ubiquitous social media into deeper and more personalized curriculum and teaching strategies. (Kirkpatrick)

Another compelling report came out recently from GSMA Mobile Education in 2012 called, *The Mobile Proposition for Education*. The report states at the beginning of the report:

The growing adoption of smartphones, tablets, portable gaming machines and other handheld devices by individuals is building a potentially compelling learning platform that could be harnessed by a significant proportion of the education market. Mobile technologies can also be used collectively to enhance group-based teaching and learning either within an institution or in out-of-classroom scenarios. (GSMA Mobile Education 4)

The report continues through almost thirty pages in details of how mobile education provides outlets for vocational education and training, consistent connectivity for children, out of classroom education and collaboration, professional learning and development, literacy skills, and support for students with learning difficulties and disabilities. Among the key concepts highlighted within these topics include the practicality of real-time interaction that allowed students to “feel less isolated and better supported when doing practical work in different locations,” the positive response of children wanting to engage

---

## Conclusion

more with “cool” mobile technology, and the differentiated learning opportunities that m-learning affords students so that curriculums can be personalized in a way that promotes literacy and aids learning disabled students as well. One of the insights that GSMA made in looking at the broader benefits of m-learning was the following:

Connected mobile devices make it easier for pupils to complete homework and keep up with the curriculum even when their education takes place across multiple locations. Greater completion of homework should help students' attainment, improve schools' examination pass rates and enhance the education level of the future workforce. Improved student achievement, satisfaction, and feelings of being valued, trusted and supported by their school, can lead to less absenteeism, improved achievement, and a higher likelihood of progression into further and higher education, while making school leavers more attractive to employers. (GSMA Mobile Education 11)

GSMA even praised the idea of using mobile devices for improving literacy through the use of e-books, stating,

If weaker readers feel challenged by large volumes of text or have a short attention span, a book can be delivered to a tablet computer or smartphone, for example, in manageable chunks or broken up by illustrations. Moreover, a mobile device can be configured to read parts of the text aloud to help with more difficult passages.... Electronic books delivered to mobile devices can make reading a richer and more engaging experience, helping learners to become more literate and knowledgeable. Better literacy skills and greater knowledge should translate into higher levels of academic and workplace achievement and ultimately a more educated workforce, benefitting both individual employers and the economy as a whole. (GSMA Mobile Education 19)

The information provided in this GSMA report strongly endorse the use of m-learning, and provides strong evidence supporting the global mobilization of m-learning.

Going forward, the personalization of m-learning, as demonstrated in all of these examples, is a crucial issue that is discussed in m-learning circles right now. Traxler effectively argues that “... mobile learning offers a perspective that differs dramatically from personalised conventional e-Learning in that it supports learning that recognizes the context and history of each individual learner and delivers learning to the learner when and where they want it....Mobile learning is uniquely suited to support context-specific and immediate learning, and this is a major opportunity for distance learning since mobile technologies can situate learners and connect learners.” (Traxler 7) This would easily be a major reason for utilizing mobile technology, as this personalization to deliver short chunks of information designed to the learner would certainly motivate the learner not only to retain more information, but to continue to want to learn.

## *Conclusion*

---

There is little question that m-learning is quickly expanding in the education field as new mobile technology devices are released and improved. While it is difficult to keep up with all the new innovations, it is the responsibility of e-learning specialists to recognize that m-learning is the future of e-learning, and the means of helping students by providing curriculums that are formatted in a way that

---

## Conclusion

accommodates not only the new technology, but also accommodates the learner. Mandeep Singh summarized the concepts of this paper well when talking about how the future of m-learning will promote memory and literacy with the following:

Mobile technologies have provided unique opportunities for educators to deliver educational materials efficiently, and to support the cognitive and social process of student learning....As such M-Learning concept should be popularized in every part of the world so that learning process can be made easy, enjoyable, time saving, portable and accessible. The characteristics of mobile devices like ubiquity, access, richness, efficiency, flexibility, sincerity, reliability, interactivity have to be improved to reach the high efficiency of mobile learning for the future generalization as well as for the hard to reach learners. MLearning facilities become an unavoidable source into the process of learning without which the future may not be possible. (Singh 71-72)

As we've seen described in this paper, m-learning has evolved from early orality and literacy practices to teach learners in small segments known as learning objects, and progressed using those same concepts, but having additional mobile technology features that allow multimedia, GPS and other features to be used for "anytime, anywhere" accessibility. This clearly shows major advantages over traditional e-learning practices, and strong support that m-learning is the future in digital education.

---

**Works Cited**

*Works Cited*

---

- Ally, Mohammed. *Mobile Learning: Transforming the Delivery of Education and Training*. Edmonton, Canada: AU Press/Athabasca University, 2009. e-book.
- Boehle, Sarah. "Don't Leave Home Without It." *Training* (2009): 30-35. Print.
- Bolter, Jay David. *Writing Space: Computers, Hypertext and the Remediation of Print*. Second Edition. Mahwah: Taylor & Francis e-Library, 2009. Kindle Book.
- Brown, Judy. "Can You Hear Me Now?" *Training & Development* 64.2 (2010): 28-30. Print.
- Elias, Tanya. "Universal Instructional Design Principles for Mobile Learning." *International Review of Research in Open and Distance Learning* 12.2 (2011): 143-156. Print.
- GSMA Mobile Education. *The Mobile Proposition for Education*. Report. London: GSMA, 2011. Print.
- Hlodan, Oksana. "Mobile Learning Anytime, Anywhere." *BioScience* 60.9 (2010): 682. Print.
- Kirkpatrick, Laura. "BYOT: Bring your own technology." 24 April 2012. *The Joan Ganz Cooney Center at Sesame Workshop*. 24 April 2012. <<http://joanganzcooneycenter.org/Cooney-Center-Blog-228.html>>.
- Kukulka-Hulme, Agnes. "Learning Cultures on the Move: Where are we heading?" *Journal of Educational Technology & Society* 13.3 (2010): 4-14. Print.
- Loomba, Kapil and Pooja Loomba. "Mobile Learning in Knowledge Development Scenario." *DESIDOC Journal of Library & Information Technology* 29.5 (2009): 54-56. Print.
- Ong, Walter J. *Orality and Literacy: The Technologizing of the World*. New York: Taylor & Francis e-Library, 2004. Kindle Book.
- Park, Yeonjeong. "A Pedagogical Framework for Mobile Learning: Categorizing Educational Applications of Mobile Technologies a into Four Types." *International Review and Research of Open Distance Learning* 12.2 (2011): 78-102. Print.
- Quinn, Clark N. *Designing mLearning: Tapping into the Mobile Revolution for Organizational Performance*. San Francisco: Pfeiffer, 2011. iBook.
- Shih, Yuhsun Edward and Dennis Mills. "Setting the New Standard with Mobile Computing in Online Learning." *International Review of Research in Open and Distance Learning* 8.2 (2007): 1-16. Print.
- Singh, Mandeep. "M-learning: A New Approach to Learn Better." *International Journal of Education & Allied Sciences* 2.2 (2010): 5-72. Print.
- Traxler, John. "Defining, Discussing and Evaluating Mobile Learning: The moving finger writes and having writ..." *International Review of Research in Open and Distance Learning* 8.2 (2007): 1-12. Print.

---

### Works Cited

- Villar, Mayra Aixa. "Designing Learning for the Ultimate Mobile Learner's Experience." 9 April 2012. *The Mobile Learning Revolution Blog*. Ed. R. J. Jacquez. web. 12 April 2012. <<http://rjacquez.com/designing-learning-for-the-ultimate-mobile-learners-experience/>>.
- Ya, Zheng, et al. "The Psychology of E-Learning: A Field of Study." *Journal of Educational Computing Research* 29.3 (2003): 285-296. Print.
- Yacovelli, Steven R. "Understanding learning objects: The basic 'chunks'." *College and University Media Review* 10.1 (Fall 2003/Winter 2004): 17-26. Print.