

Successful Use of Mobile Apps in m-Learning and Risk Communication

**Margaret Wan, Ph.D., CIH, CHMM, CET, HEM
Principal Consultant and Trainer
EOH Consulting
St. Petersburg, FL**

Introduction

Mobile learning, or m-learning, has been defined and interpreted in many ways. According to EDUCAUSE (2010), “Mobile learning, or m-learning, can be any educational interaction delivered through mobile technology and accessed at a student’s convenience from any location.” The landscape of m-learning is vast and includes education of customers and prospects. This paper focuses on training and risk communication for employees (and contractors as applicable).

The wave of today and the future in training and education is m-learning. It is estimated that the worldwide mobile worker population will increase to 1.3 billion by 2015 (Crook et al. 2011). Many safety, health, and environmental (SH&E) professionals, and the workers they train, already work at sites that may range from an orchard to an oilfield.

With the changing characteristics of the workforce, the prominence of m-learning has increased rapidly. Its popularity is fueled, in no small part, by the widespread adoption of the use of mobile devices by consumers and businesses globally. For example, 60% of the American population in 2010 went online using a laptop or mobile phone (Pew Research Center, 2010). In Africa, the second largest mobile market in the world after Asia, the number of mobile connections has grown an average of 30% annually and m-learning initiatives have helped improve access to education where the number of schools is limited in remote areas (GSM Association 2011). In the United States alone, the market for m-learning products and services reached almost \$1 billion in 2010, with a five-year compound annual growth rate of 13.7% (Adkins 2011).

Leveraging Mobile Apps in m-Learning and Risk Communication

The exponential growth in the market for mobile devices, especially smartphones, offers tremendous opportunities for the use of m-learning as a delivery method in training and risk communication. Some of the advantages are as follows:

Ease of Access

The integration of mobile devices in people's lives means that a learner can use mobile apps to access learning modules or other information without special hardware or equipment. The nature of these devices allows easy access to training materials anytime, anywhere. Learning can take place whenever a learner has a few minutes of "downtime," whether it is waiting for a plane to arrive or for a restaurant to prepare a food order.

Timeliness of Information

The availability of just-in-time information not only can enhance employee performance but also can play a significant role in risk communication. For example, the safety data sheet for a hazardous substance can be obtained by a laboratory employee instantaneously at the time of cleaning up a chemical spill, without having to search for the information on a desktop computer or in a binder.

Engagement of Learners

The fact that mobile devices have become almost omnipresent among the population regardless of geographic and cultural diversity promotes learner engagement. A learner is more likely to access the apps when a mobile device is at his or her fingertips than when the individual must retrieve information or learning modules through a less portable device.

Support of Learning Activities

A study by the Pew Research Center (2010) has found that as of May 2010, 34% of mobile phone owners in the United States use their phones to play games. Games, simulation, and similar activities incorporated into m-learning apps would be a natural extension of activities with which learners are already familiar. Collaborative learning is made easy when every member of a group has a smartphone that can be used for both activities and communications.

Chunking of Content

While more and more facts and data are readily retrievable in this information age, people's attention span is becoming shorter and shorter. This is particularly true in a generation that has grown up texting and tweeting. Research has demonstrated the benefits of matching training to adult attention span through chunking, for example, by delivering three 20-minute sessions instead of one 1-hour instruction (Murphy, 2008). Mobile apps are conducive to delivering materials in chunks. As a matter of fact, they are most suitable for engaging learners for a brief time, perhaps only a few minutes, as in gathering learner reaction during in-person training or providing instant information in risk communication.

Availability of Software

In addition to special software for m-learning, there is a wealth of software applications that can be incorporated into m-learning apps. Examples are e-book reader and geolocation software. Some software is proprietary and does not work across different mobile devices and platforms. The trend, however, is that more cross-platform programs are being developed.

Selecting or Designing Apps for m-Learning

Whether the goal of an SH&E professional is to select mobile apps from an outside source or to design apps in-house, the characteristics of well-designed apps must be understood.

A few years ago, CBT (computer-based training) was the buzzword. Now m-learning is the hot topic. CBT and m-learning share something in common that is unfortunate—both are “victims” of the myth that training materials used in these delivery methods can be produced simply by converting existing materials into a different format. For a long time, much of CBT has been based on PowerPoint presentations designed for in-person training. A similar approach is found where e-learning materials are converted to a “lite” version to facilitate retrieval on a mobile device, similar to websites that have a mobile version. To maximize the benefits of m-learning, content should be specifically designed for mobile delivery. This does not mean that one should discard the training materials from in-person and e-learning and start from scratch. It does mean that the presentation of the materials deserves special thought. The contents of existing materials can be leveraged in m-learning for cost-effectiveness (Poulos n.d.).

Why is m-learning not e-learning “lite”? One of the major differences between e-learning and m-learning is that the former is designer-centered, whereas the latter is learner-centered. Oftentimes e-learning has complicated menu structures. Also, e-learning content is written on web pages for a target group of learners. There is still a target audience in m-learning; however, the content should be customized for each individual in the group. This is because to take full advantage of the power of m-learning, a learner should have the flexibility of accessing information on only part of the “page” that is relevant to his or her need at the moment (Poulos n.d.). Apps for m-learning should be designed to meet learner expectations.

Learner Expectations

Every individual is different, yet the following features are fundamental to learner acceptance.

Personalization

This feature is particularly relevant to effective use of mobile apps in the SH&E arena. SH&E professionals may encounter many situations where access to the right information in the right place at the right time is critical. Personalization encompasses customization in the areas of context, content, and navigation. The good news is that m-learning software enables a trainer or instructional technologist to easily assemble and reuse content and media assets in different ways to suit different learners (Poulos n.d.).

Multimedia

When used properly, rich content that includes text, graphics, audio, and video is conducive to learning, and it is expected by learners using mobile apps. Learners may also need content that can be downloaded for offline use. Learning management systems offer the convenience of placing content in repositories and adapting the media format for delivery to various mobile devices.

Interactivity

The popularity of social media and virtual communities reflects users’ affinity for sharing and collaboration. Mobile apps would be expected to integrate highly interactive functions. This is good for the organization as the likely results would be more efficient team cooperation and higher team and individual performance.

Integration

Since a learner may switch from one mobile device to another or to a desktop computer, once content is created, including learner-generated content, such as notes and blog posts, it should be

possible to retrieve and reuse the content on a different device or delivery platform. Learners would not want to use an app that does not have this flexibility.

Support

An advantage of delivering m-learning is that it has no boundary in time or place, so 24/7 access is the norm. Even though m-learning is self-paced for the most part, learners may need to consult subject matter expert (SME) or technical support at some point. Availability of these services, also 24/7, is preferred especially around the time of initial launch.

Design Considerations

Keeping learners' expectations in mind, one must work within technical constraints—at least until the frontier of mobile technology pushes out further. The following are recommendations for designing mobile apps that learners would want to use:

Learner Experience

Despite its many advantages, m-learning is delivered in surroundings that have more distractions than the traditional classroom. The appearance of the mobile app's landing page as well as other content must have visual appeal to grab and maintain attention. A "search" function is essential to assist self-directed learners in finding what they need. A "help" function can also be embedded in the app. Such user-friendly features can reduce incidents when SME or technical support is needed.

Screen Size

Although mobile devices vary in types and sizes, the most ubiquitous is still the smartphone. A mobile app's page layout and menu system should be simple so that elements are not cluttered on a small screen and navigation using small buttons or touch screen is easy. Use short titles to avoid wrapping and concise text to reduce scrolling. Consistency in the organization of content and interface would help learners navigate through the screens to explore a topic in-depth or move to another topic (Advanced Distributed Learning Initiative n.d.).

Connection Speed

Another reason for simplicity of page layout is that the connection speeds of mobile data networks are usually slower than, say, the speed of a cable network connected to a desktop computer. Wi-Fi networks sometimes used by mobile devices vary in speed. Taking too long to download content may drive a user away.

Storage Capacity

Simple page design and small file size also reduce the demand for storage space. In spite of the rapid advances in hardware for mobile technology, storage space is limited compared with a desktop computer. Content to be downloaded and stored in a mobile device, so that it can be referenced later offline, should occupy small storage space. This aspect may not be an issue for the average users of mobile devices as they are usually connected to the data networks. It might be important in the field of SH&E as some work sites may not have network access.

File Format

Not all file formats are supported by all mobile devices. Also, some file formats are only viewable on certain devices using additional software. For instance, an app like Quickoffice is needed to open a Microsoft Office file on an Android device. To ensure maximum compatibility,

Wilson et al. (2011) suggest staying with the most common file formats, such as pdf, doc, docx, ppt, jpg, gif, png, mp3, and mp4.

Font Style

Since mobile devices generally do not have many fonts installed, it is advisable to use a basic font. Arial is preferable to Times New Roman since a sans serif font is easier to read, especially on a small screen. Avoid using symbols.

Selection Criteria

Ideally if an EH&S professional is to select existing mobile apps in the market, the apps should meet learner expectations and design considerations as described above. The content of any third-party product must be screened for accuracy, particularly if the app is not distributed by the agency or institution that is the original source of a standard or reference. For example, the app “OSHA Heat Safety Tool” is distributed by the Occupational Safety and Health Administration (n.d.), whereas the app “NIOSH Lifting Evaluation” is not developed by the National Institute for Occupational Safety and Health. The functionalities of the apps should also be tested before they are distributed to learners.

Going Beyond the “Training Presentation”

“Learning and performance support are morphing into a single application in a contemporary version of on-the-job training” (Adkins 2011 5). The types of digital content that can be incorporated into apps for m-learning are numerous. External links to additional resources can be included as well. The following are a few examples of content applicable to just-in-time and on-the-job training:

- Decision support tools
- Regulatory and consensus standards
- Policies and procedures
- Technical documentation
- Operating instructions
- Alerts, reminders, and checklists

Along with reference materials, pertinent photos and videos can be included for “live” demonstration. Mobile augmented reality technology using geotagging to overlay contextual content on physical locations is valuable in emergency management, for example, to show evacuation routes.

Content inserted into a work flow process improves efficiency and facilitates teamwork. A mobile app designed to train safety auditors, for instance, may include a feature whereby with the touch of a button, a new auditor can be connected to the lead auditor to request guidance on specific issues.

Achieving Successful Deployment

As in any training, before full deployment the pilot course should be tested with a sample group of learners. Obtain learner feedback and implement changes as appropriate. Ensure that support is available to learners from the pilot phase to full deployment and thereafter.

Innovative Learning Group Inc. (2011) recommends a few extra steps to ensure successful deployment of mobile apps:

- Publicize the app on the intranet and emphasize its benefits to the learners.
- Assure learners that they can access the “help” function within the app if necessary.
- Post a demonstration or practice simulation online for the learners to see and try out the app’s features and functions.
- Compile an FAQ based on feedback from participants of the pilot course and early adopters among the target group; post it along with tips for using the app.

Conclusion

The successful use of mobile apps for m-learning and risk communication, as other delivery methods, requires that the instructional strategy supports the learning objectives which, in turn, are aligned with the goals of a comprehensive training program and the mission of the organization. Laplante states (2011 13), “At the end of the day, mobile delivery of learning content is a publishing process. In greatly simplified terms, content is created, assembled, packaged, and distributed. And like every other enterprise publishing process, formal content management strategies and practices are the means to cost efficiencies and rapid deployment.” Having acquired and distributed well-designed, learner-centered apps, continuous monitoring, evaluation, and refinement are imperative in a world of ever-changing mobile technology.

Disclaimer

Mention of any product does not constitute endorsement by the author or her institution.

Bibliography

- Adkins, S. S. 2011. *The US Market for Mobile Learning Products and Services: 2010-2015*. (Retrieved March 13, 2013) (<http://www.ambientinsight.com/Resources/Documents/Ambient-Insight-2010-2015-US-Mobile-Learning-Market-Executive-Overview.pdf>).
- Advanced Distributed Learning Initiative. n.d. *Mobile Learning Handbook*. (Retrieved March 11, 2013) (<https://sites.google.com/a/adlnet.gov/mobile-learning-guide/home>).
- Crook, S. K., J. Jaffe, R. Boggs, and S. D. Drake. 2011. *Worldwide Mobile Worker Population 2011-2015 Forecast. Abstract*. (Retrieved March 13, 2013) (<http://www.idc.com/getdoc.jsp?containerId=232073#.UUgzdzeO71s>).

- EDUCAUSE. 2010. *7 Things You Should Know about Mobile Apps for Learning*. (Retrieved March 11, 2013) (<http://www.educause.edu/ir/library/pdf/ELI7060.pdf>).
- GSM Association. 2011. *African Mobile Observatory 2011: Driving Economic and Social Development through Mobile Services*. (Retrieved March 12, 2013) (<http://www.gsma.com/publicpolicy/wp-content/uploads/2012/04/africamobileobservatory2011-1.pdf>).
- Innovative Learning Group Inc. 2011. *Delivery Method Selection Guidelines*. (Retrieved March 10, 2013) (http://www.innovativelg.com/content/secure/viewpdf.aspx?f=ILG_Delivery_Method_Selection_Guidelines_White_Paper.pdf).
- Laplante, M. 2011. *Smart Approaches to Managing Mobile Learning Content*. (Retrieved March 13, 2013) (http://www.outsellinc.com/contact_us/complimentary_report?report_id=1078).
- Murphy, M. 2008. "Matching Workplace Training to Adult Attention Span to Improve Learner Reaction, Learning Score, and Retention." *Journal of Instruction Delivery Systems* 22 (2):6-13.
- Occupational Safety and Health Administration. n.d. *Heat Safety Tool*. (Retrieved April 12, 2012) (http://www.osha.gov/SLTC/heatillness/heat_index/heat_app.html).
- Pew Research Center. 2010. *Mobile Access 2010*. (Retrieved March 12, 2013) (<http://pewinternet.org/Reports/2010/Mobile-Access-2010.aspx>).
- Poulos, D. n.d. *The Top 10 Reasons your Mobile Learning Strategy Will Fail*. (Retrieved March 13, 2013) (<http://www.xyleme.com/blog/the-top-ten-reasons-your-mobile-learning-strategy-will-fail>).
- Wilson, E., L. Day, L. Hives, J. Kelleher, and R. Lilleker. 2011. *Best Practices for Mobile-Friendly Courses*. (Retrieved March 13, 2013) (<http://www.blackboard.com/getdoc/59e6f603-876e-4833-9757-d22c6bffd092/Best-Practices-for-Mobile-Friendly-Courses.aspx>).