

## MOBILE AND MOBILE LEARNING

Delivering open educational resources on mobile devices will provide education to all and revolutionise education. The learning environment is becoming a more flexible concept — we are moving away from the idea of learning in a school at a specific time to the notion of learning anywhere and at any time. Therefore, education has to reinvent itself to keep up with particular trends — such as learning becoming learner-centred, virtual and globalised — and with the demands for a more flexible system that will provide education for all. The increasing use of mobile technology globally, and the increasing availability of electronic learning materials and open educational resources, is making learning more accessible and more affordable for anyone who wants to learn.

## MOBILE TECHNOLOGY AND LIFELONG LEARNING

Because of the constant changes in society and the information explosion, citizens must participate in lifelong learning to keep up with progress and to stay informed. Lifelong learning is an ongoing process where a person gains new knowledge and skills throughout his or her life. Mobile technology can have a significant impact on lifelong learning. Citizens who need current information for immediate use can use mobile technology to access the appropriate learning materials. Workers who need to upgrade their skills can access the appropriate learning materials. Citizens with low incomes and family responsibilities and those who live in remote locations cannot afford to go to another location to learn. Mobile technology can bring learning opportunities to them. Education should be open so that everyone can upgrade their knowledge and skills at any time. This is education for all. Mobile technology, along with open educational resources, provides equal access to learning materials. Allowing learners of all ages to use mobile technology to access learning materials from anywhere and at any time will empower learners to learn.

*Mobile technology is a powerful learning tool. Educators and governments must empower learners to use this tool to learn.*

## EFFECTIVENESS OF MOBILE LEARNING

Research conducted on the use of mobile technology in education has shown positive learning outcomes and positive learner experiences. Wu et al. (2012) conducted a meta-analysis of 164 mobile learning studies and found that 142 (87%) of the studies reported positive outcomes from mobile learning. Athabasca University in Canada conducted three research studies on the use of mobile technology in language training (Ally et al., 2008). The results indicated that learners like the flexibility that mobile learning provides and they like being in control of their learning. Learners reported positive experiences when using a mobile phone to learn. They indicated that the use of mobile technology for learning would be a good supplementary medium for learning whenever they had some spare time — for example, when waiting for a bus or travelling on a train. Using mobile devices to access the online course content increases motivation and opportunity for learning. Online content means that learning materials are at learners' fingertips — they are just one click away — which means that they can learn wherever they are, despite the constraints of busy daily schedules and commuting. A project in the State of Qatar examined the use of mobile technology for

workplace learning (Ally et al., 2013). Learners reported that they like the interactivity in this type of learning and that they would like to see more mobile learning materials delivered using mobile technology. Ally and Stauffer (2008) conducted a study where learners had the option of accessing their course materials from anywhere and at any time using their mobile devices. The majority of learners who took part in the study either agreed or strongly agreed that the use of the mobile device to access the course materials was useful and provided both flexibility and convenience. They also liked the convenience of being able to access the course work on a mobile device from wherever they were and whenever they had time.

## THE FUTURE OF LEARNING WITH MOBILE TECHNOLOGY

Mobile and emerging technologies will allow access to information and learning materials for everyone, regardless of time or place. The technology will exist everywhere, giving learners seamless access to learning materials. The learning space is moving away from learning in a classroom at a specific time to learning anywhere and at any time. Some trends that educators and policy makers must be aware of:

1. The role of the teacher is changing from that of a presenter of information to that of a facilitator of learning.
2. Learning will take place at any time of the day on any day of the week.
3. Learning materials will be available in electronic repositories, which will allow learners to access them at any time and from anywhere.
4. Because of the Internet, there will be no geographic barrier to accessing learning materials.
5. Learning materials will be available as open educational resources under Creative Commons licences that allow teachers to use them at no cost for educational purposes.
6. Learning will be learner-centred, not teacher-centred.
7. There will be more use of multimedia materials to meet the needs of the current and upcoming generations of learners.
8. The learning system will be intelligent. The system will monitor the learner as the learner progresses and will adapt the interface for the learner or prescribe the next appropriate learning sequence.
9. Learning technology is evolving rapidly.

Educators and policy makers must not prevent or discourage learners from using mobile technology for learning either in schools or outside of schools. To help them make proper use of mobile technology for learning, learners must be educated on the ethical use of technology at an early age. At the same time, teachers must be trained on how to use mobile technology in the teaching process so that learners can use the technology to learn.

To make sure all citizens have access to education, there has to be a paradigm shift in education. Rather than the learner going to a specific location to learn, mobile technology can be used by learners to access learning from wherever they are located and at any time.

Countries should consider access to information as a strategic initiative, enabling citizens to access information to improve their lives and well-being. This will increase competitiveness and quality of life in developing countries. Countries must prepare their citizens for the 21st century so that they can prosper in a competitive world. Countries will progress if they can educate all citizens and help them to contribute to society. One way for countries to do this is to implement mobile learning to reach citizens regardless of location, gender and background.

## REFERENCES AND BIBLIOGRAPHY

Ally, M., Samaka, M., Ismail, L., & Impagliazzo, J. (2013). Use of mobile learning apps in workplace learning. *Bulletin of the IEEE Technical Committee on Learning Technology*, 15(4), October 2013, pp. 6-9.

Ally, M. (2009). *Mobile Learning: Transforming the delivery of education and training*. Athabasca, Canada: Athabasca University Press. Available at <http://aupress.ca/index.php/books/120155>

Ally, M., McGreal, R., Schafer, S., Tin, T., & Cheung, B. (2008). Use of a mobile digital library for mobile learning. In G. Needham & M. Ally (Eds), *M-libraries: Libraries on the move to provide virtual access*, pp. 217-228. London, UK: Facet Publishing.

Ally, M. & Stauffer, K. (2008, March). *Enhancing mobile learning delivery through exploration of the learner experience*. Paper presented at the 5th International Conference on Wireless, Mobile and Ubiquitous Technologies in Education (WMUTE2008), Beijing, China.

Khan, B.H. (Ed.). (2007). *Flexible learning in an information society*. Hershey, PA: Information Science Publishing.

Khan, B.H. (2005). *Managing e-learning: Design, delivery, implementation and evaluation*. Hershey, PA: Information Science Publishing.

A LIST OF RESOURCES IS AVAILABLE AT: [WWW.COL.ORG/M4D](http://WWW.COL.ORG/M4D)

The Commonwealth of Learning (COL) is an intergovernmental organisation created by Commonwealth Heads of Government to encourage the development and sharing of open learning/distance education knowledge, resources and technologies. COL is helping developing nations improve access to quality education and training.

The Commonwealth is a voluntary association of more than 50 independent sovereign states, which provide support to each other, and work together toward international goals.

ISO/IEC TS 29140-2. (2011). *Information technology for learning, education and training — nomadicity and mobile technologies — Part 2: Learner information model for mobile learning*. International Organization for Standardization (ISO).

O'Malley, C. Vavoula, G., Glew, J.P., Taylor, J. & Sharples, M. (2003). *Guidelines for learning/teaching/tutoring in a mobile environment*. Available at [www.mobilearn.org/download/results/public\\_deliverables/MOBIlearn\\_D4.1\\_Final.pdf](http://www.mobilearn.org/download/results/public_deliverables/MOBIlearn_D4.1_Final.pdf)

Tsinakos, A., & Ally, M. (2013). *Global mobile learning implementations and trends*. Beijing, China: CCRTVU Press. Available at <http://ade.ouchn.edu.cn/?action-viewnews-itemid-200>

Venkataraman, B., & Prabhakar, T.V. (2014). Changing the tunes from Bollywood's to rural livelihoods — Mobile telephone advisory services to small and marginal farmers in India: A case study. In M. Ally & A. Tsinakos (Eds), *Increasing access through mobile learning*, pp. 205-216. Vancouver, Canada: Commonwealth of Learning.

Wu, W., Wu, Y.J., Chen, C., Kao, H., Lin, C., & Huang, S. (2012). Review of trends from mobile learning studies: A meta-analysis. *Computers & Education*, 59(2), 817-827. Available at <http://dx.doi.org/10.1016/j.compedu.2012.03.016>.

The Commonwealth is described as a “family” of nations, originally linked together in the British Empire, and now building on their common heritage in language, culture and education, which enables them to work together in an atmosphere of greater trust and understanding than generally prevails among nations.

Bringing together some 1.7 billion people of many faiths, races, languages, traditions and levels of economic development, the Commonwealth represents almost one-third of the world's population.

## INCREASING ACCESS TO EDUCATION FOR ALL THROUGH MOBILE LEARNING

This guide was prepared by Dr Mohamed Ally, Professor in Distance Education and a Researcher in the Technology Enhanced Knowledge Research Institute (TEKR) at Athabasca University, Canada.

The Knowledge Series is a topical, start-up guide to distance education practice and delivery. New titles are published each year.  
Editor: Lesley Cameron  
Designer: Denise Tremblay

All Web references and links in this publication are accurate at press time.  
Commonwealth of Learning, 2014

Commonwealth of Learning, 4710 Kingsway, Suite 2500  
Burnaby, BC V5H 4M2, CANADA  
PH: +1.604.775.8200 | FAX: +1.604.775.8210  
EMAIL: [info@col.org](mailto:info@col.org) | WEB: [www.col.org](http://www.col.org)

Photo credits in order of appearance:  
Frerieke, *Day 24.10 tablet testing*, CC BY-NC 2.0. Desaturated from original, [www.flickr.com/photos/34816987@N00](http://www.flickr.com/photos/34816987@N00)  
Commonwealth of Learning, L3F, CC BY-SA. 4.0  
thaths, *Basket salesmen play with a mobile phone*, CC BY-NC 2.0. Desaturated from original, [www.flickr.com/photos/34816987@N00](http://www.flickr.com/photos/34816987@N00)  
CTEP AmeriCorps, *IMG\_1504*, CC BY 2.0. Cover desaturated from original, [www.flickr.com/photos/ctep/14220872218](http://www.flickr.com/photos/ctep/14220872218)  
miniyoy73, *portatil-tablet-smartphone*, CC BY-SA 2.0, [www.flickr.com/photos/38284869@N06](http://www.flickr.com/photos/38284869@N06)  
Dipanker Dutta, *voice of the nation*, CC BY 2.0, [www.flickr.com/photos/dipu87](http://www.flickr.com/photos/dipu87)  
Wesley Fryer, *Students respond to a Nearpod question*, CC BY 2.0, [www.flickr.com/photos/wrfryer](http://www.flickr.com/photos/wrfryer)  
Commonwealth of Learning, *APTUS*, CC-BY-SA, 4.0



## KNOWLEDGE SERIES

# Knowledge Series

A TOPICAL, START-UP GUIDE TO DISTANCE EDUCATION PRACTICE AND DELIVERY



PRINTED ON RECYCLED PAPER  
also available at [www.col.org/knowledge](http://www.col.org/knowledge)



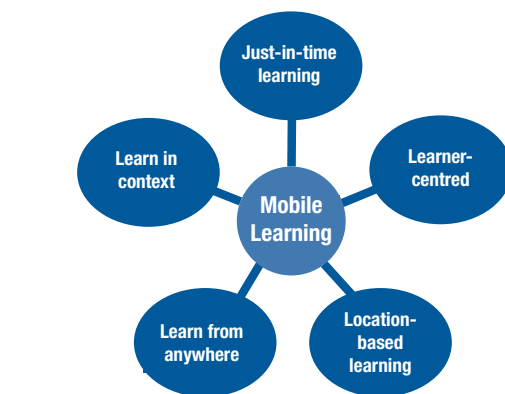
The increasing use of mobile technology throughout the world makes this the first time in history that we have the opportunity to provide education for all. Governments and educators would be wise to take full advantage of this opportunity.

## INTRODUCTION

We are in the mobile technology age. Mobile technology use has increased faster than that of any other technology in our history, and developing countries have the fastest growth rate of mobile technology acquisition. Mobile Web usage is expected to double within five years and so become the most common way of accessing the Web. Educators must therefore be prepared to use mobile learning approaches to meet the needs of the current and future generations of learners. People in remote locations and in developing countries are moving directly to mobile technology rather than acquiring desktop and notebook computers.

Mobile learning means using mobile technology — mobile phones, smartphones and tablets, for example — to deliver learning materials to learners regardless of their location. Learners will need connectivity to access the learning materials from a server using their mobile technology. In some cases, the learning materials will be in the form of mobile applications (apps) that allow learners to access the learning materials at any time. Apps are convenient for learners who have limited or sporadic connectivity: they can be downloaded when the learner has connectivity and accessed later, so the learner can learn without being connected to a server or the Internet. For learners in remote locations, some systems allow learners to access learning materials from a local server without having to connect to the Internet. One such system is the Aptus system, which was designed by the Commonwealth

of Learning (COL). This system allows learners to connect to digital learning platforms and content without the need for grid electricity or Internet access. The Aptus system is very portable and can be used in a virtual classroom anywhere, whether it is in a remote village or in a major city.



## WHAT IS MOBILE LEARNING?

There are many definitions of mobile learning, but they all centre round flexible learning to improve access. O'Malley et al. (2003: 7) define mobile learning as “any sort of learning that happens when the learner is not at a fixed, predetermined location, or learning that happens when the learner takes advantage of the learning opportunities offered by mobile technologies.” Ally (2009) views mobile learning as an approach to learning that includes interactive learning strategies that encourage learner-centred education so that learners can be in control of their learning. A recent definition of mobile learning offered by an International Organization for Standardization (ISO) committee (ISO/IEC TS 29140-2, 2011) describes it as learning through the use of information and communication technologies in mobile contexts. This definition emphasises that learners are mobile and that they use technologies to learn while they are mobile.

## BENEFITS OF MOBILE LEARNING

Thanks to the flexibility that mobile technology provides, there are many benefits to using mobile learning in education. For example, it can be used for both formal and informal learning. In formal learning, learners can use their mobile devices to access course materials while they are on the move, or indeed any time they want to learn. In informal learning settings, individuals can learn anywhere and at any time so that they can apply what they learn right away to facilitate meaningful learning. Informal learning with mobile technology can be used in different sectors such as education, health, agriculture or finance (Tsinakos & Ally, 2013; Venkataraman & Prabhakar, 2014). Having the content online and always available means that learners can

learn wherever they are and whenever it suits them. They can work around their busy schedules, commuting, etc. This makes learning more accessible and increases their motivation to persevere.

Mobile technology, along with open educational resources (OER), provides an equal opportunity to all to access learning materials. Technology can bring learning opportunities to adult learners, the disabled and those with limited mobility. Disadvantaged learners who cannot afford to go to school can access learning materials using mobile technology from wherever they are located. Individuals do not have to leave their communities or families to learn, which removes another cost concern.

The young generation of learners — that is, teenagers and learners in their twenties — is referred to as the mobile generation because they use mobile technology daily and have grown up with it. Educators must act on this and engage learners by using mobile technology as a learning tool. Mobile technology also allows learners to network with other learners around the world and lets them learn from each other and share information. Learners will also be able to connect with experts around the world to access current and relevant information about a variety of subjects. Learners in remote locations and the economically disadvantaged will feel connected and empowered by learning through this technology. Mobile technology can be used to develop and deliver multimedia learning materials (video, pictures, audio, animation, etc.) that will motivate learners and facilitate high-level learning. In turn, learners can use mobile technology to record video, pictures and audio to use for learning, to develop electronic portfolios or simply to share with others.

Wireless mobile devices are small enough to be portable, which means learners can use the devices anywhere and at any time to interact with other learners to share information and expertise, complete a task or work collaboratively on a project. Learners can use the wireless capability of their mobile devices to access up-to-date and relevant learning materials from the Web and to communicate with experts in the field in which they are studying.

## THE TEACHER'S ROLE IN MOBILE LEARNING

Mobile learning will change the teacher's role to that of a facilitator of learning rather than a presenter of information. Teachers must be trained for this new role. They must have a basic understanding not only of the technology and its features but also of how to develop effective learning strategies for mobile learning, which is learner-centred rather than teacher-centred. What will the teacher have to do in this new role of facilitator?

- Facilitate learning on an ongoing basis.
- Motivate learners by using interactive learning materials.
- Engage learners to promote high-level learning.

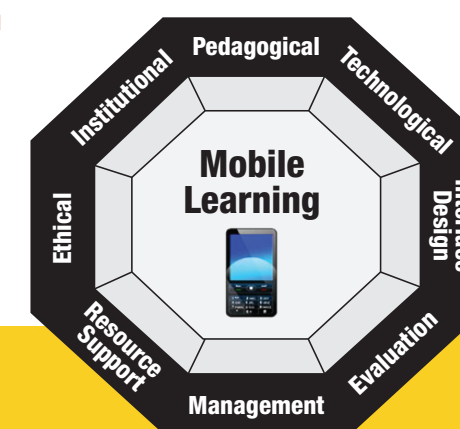
- Help learners with content problems so that they can complete their courses successfully.
- Address learners' personal problems so that they can complete their courses on time.
- Evaluate learners' performance to provide feedback to them and to determine if they have achieved the learning outcomes.
- Use the technology to deliver the learning materials and to interact with learners one-on-one.

## IMPLEMENTING SUCCESSFUL MOBILE LEARNING

For the successful implementation of mobile learning, organisations need the proper infrastructure, people, policies and training programmes, etc. Organisations must follow an established model or framework for the successful implementation of mobile learning. One tried and tested framework is the one developed by Badrul Khan (2005, 2007). It has eight dimensions that can be used as a guide to implement mobile learning successfully.

BADRUL KHAN  
FRAMEWORK  
FOR MOBILE  
LEARNING

(ADAPTED WITH  
PERMISSION)



## PEDAGOGICAL

The pedagogical dimension addresses issues such as content analysis, audience analysis, goal analysis, design, and methods and strategies that assess the principles and methods of teaching and learning. It addresses how the content of a course is designed and identifies both the learner's needs and how the learning objectives will be achieved. This dimension also addresses the delivery method for the course activities and the appropriateness of the learning environment for achieving the learning goals of its intended audience. Interactive learning strategies in mobile

learning will engage and motivate learners to learn so that they can finish their education rather than drop out of school.

## TECHNOLOGICAL

The technological dimension assesses the hardware, software and infrastructure planning. In some cases the infrastructure is for blended learning, where the delivery is a combination of mobile learning and other delivery methods such as face-to-face, print-based, etc. Does the organisation have the infrastructure to support mobile learning? For example, is there a learning management system that supports mobile learning so that learners' progress and performance can be tracked as they use mobile devices to learn?

## INTERFACE

The interface must allow easy access to course materials through mobile technology as well as access to learning materials from anywhere and at any time.

## EVALUATION

Evaluations must be conducted to determine the effectiveness of the development process and the mobile learning delivery. The instructional design process must be evaluated, because mobile learning is a new approach for most organisations. Usually, after the first lessons are developed, they are pilot-tested with learners to determine whether proper instructional design was followed. Using the feedback from the pilot test, the teacher either continues with the lesson development or revises the instructional design approach. The learners should be assessed upon completion of the lessons to determine if they have achieved the expected learning outcomes.

## MANAGEMENT

Proper project management and quality control techniques should be used to make sure that mobile learning development projects are completed on time and that quality learning materials are developed. The project team members must have the expertise required to develop quality learning materials. Usually, mobile learning materials are developed by a team of experts with different areas of expertise such as instructional design, multimedia, user interface, mobile devices applications and software. An important goal of the project manager is to make sure the team members work together to develop quality learning materials.

## RESOURCE SUPPORT

The resource support dimension considers all of the technical and human resources support required to create meaningful and successful mobile learning environments. The teacher must offer learning support to help learners with understanding content and other problems related to learning such as a lack of prerequisites (that is, previous knowledge or education) or not having the appropriate technology to access the learning materials. The teacher's role will change from that of a presenter of information to a tutor or facilitator of learning. In some cases, teachers may have to be trained in how to function in the mobile learning environment where learners will access learning materials from anywhere and at any time or when learners use social software to interact with the teacher. Social software should also be used to allow learners to communicate with each other to support and help each other using peer tutoring. Technical support should also be provided to learners in case of problems with the mobile technology or with accessing the course materials.

## ETHICAL

The mobile learning teacher must follow ethical guidelines, such as treating learners fairly and providing constructive criticism when tutoring. Learners must follow ethical guidelines when using the technology to complete their lessons. For example, learners must respect each other and must not plagiarise. Developers of mobile learning materials must follow and respect copyright regulations. Privacy guidelines must be put in place and followed to protect learners' personal and sensitive data.

## INSTITUTIONAL

The institution's website must be mobile-friendly so that learners can access information and services through a variety of mobile devices. The institution must establish the services and infrastructure to provide support to learners from the time they register for courses or programmes all the way through to course completion or graduation. Learners who use mobile technology to complete their courses at a distance should be able to access the institute's services virtually. For example, virtual library support should be available, and learners should be able to access electronic library resources from anywhere and at any time. The institute should also establish standards for tutorial support for learners. For example, there should be guidelines on when and how quickly a tutor should respond to learners' questions, or when and how quickly feedback on assignments should be provided to learners.

The availability of open educational resources for delivery through mobile technology will revolutionise education.

# MOBILE TECHNOLOGY