

MOBILE LEARNING FOR QUALITY EDUCATION AND SOCIAL INCLUSION

CONTENTS:

- Context and outline of the problem
- Definition and scope of mobile learning
- Changes in pedagogical practices
- Key advantages of using mobile and wireless technologies in education
- Key challenges and limitations
- Mobile learning for sustainable development
- Best practices in teaching and learning
- Institutional responses and policies
- Future developments
- Suggestions and recommendations

CONTEXT AND OUTLINE OF THE PROBLEM

Mobile learning is part of a new learning landscape created by the availability of technologies supporting flexible, accessible, personalized education. Learners' everyday uses of mobile phones and other devices such as games consoles, which can also be used for learning, are now major drivers for the rapid uptake of mobile learning throughout the world. Crucially, mobile learning can contribute to the global commitment to provide quality education for children, youth and adults, as expressed in the goals of Education for All (EFA).

DEFINITION AND SCOPE OF MOBILE LEARNING

It is widely accepted that the key to mobile learning lies in taking advantage of the learning opportunities offered by mobile technologies, and that this typically happens when learners are not at a fixed, predetermined location, so that they are able to engage in situated learning and make use of context-specific resources. Mobile learning also enables learners to move seamlessly across different settings and to connect up learning in different locations.

Mobile learning needs to be understood as an emerging repertoire of learning and teaching practices rooted in the belief that interaction and collaboration within a traditional classroom are often not as effective as they could be. Mobile learning has been described as 'disruptive' and 'paradigm-shifting', particularly when its focus is on learning outside traditional classrooms or overcoming the perceived inadequacies of existing curricula and forms of assessment. Mobile learning emphasizes integration of learning with life and work, so that education is no longer seen as a separate activity that has to take place in a school, university or other establishment. This creates tensions between traditional education, focused on a set curriculum and individual attainment, and mobile learning, which is constructed around learners' interests and needs in relation to diverse situations and contexts.

Devices and networks

The devices used in mobile learning are commonly:

- Mobile phones (cell phones)
- Personal listening devices such as mp3/mp4 players
- Lightweight, portable computers such as slates, tablets, netbooks and small laptops

However the range increases daily and includes games consoles, digital voice recorders, e-book readers, electronic dictionaries, and assistive technologies for learners with disabilities. Devices are increasingly multi-functional, with the ability to support speaking, listening, watching, reading, writing, searching for information, performing calculations, playing games and much more. Choice of device varies with age, location, task and other factors. Teenage and young adult learners typically use cell phones and personal media players. Mature learners may have personal digital assistants (PDAs), smartphones and laptops as part of their equipment for work.

Equally important are the networks and infrastructures which enable the devices to be connected to one another and to the Internet, including cable-free solutions that allow learners to move around and still stay connected. GPS (global positioning system) navigation makes it possible to identify a learner's location; its uses include sharing context-specific resources and delivering information relevant to a journey or a particular place.

CHANGES IN PEDAGOGICAL PRACTICES

Mobile learning eliminates the need to have special computer rooms and offers teachers full freedom to let students work with online applications whenever they need to. With a practical learning task such as cooking or machine maintenance, the mobile device allows learners to communicate and retrieve information with one hand while continuing to perform their job or practise a skill. Mobile learning is often 'content-light', and it is used more as a tool that helps learners access audio materials, receive and send text messages, respond to quizzes, participate in instant chat, make brief notes, or reflect on their learning.

- *Classroom dynamics*: Mobile learning provides new means of communication and collaboration, and a way to connect classroom learning with learning elsewhere, the journey home and learning between lessons.
- *Connecting remote learners*: Providing distributed learners with opportunities to exchange information, ask questions, and practise new skills in situ.
- *Learners as knowledge producers*: When learners are commenting, discussing, or creating and sharing digital resources, the teacher's traditional authority function shifts towards a more collaborative or mentoring role. Learner-generated content represents a significant pedagogical resource and a shift towards authentic learning.
- *Experience capture*: In work settings, recording and note-taking is facilitated, as part of collecting evidence of learning, or as a way to combine formal and informal learning.
- *Lifelong learning*: Over time, students become more able to take responsibility and the habits of lifelong learning can take root. This is facilitated by mobile access to social networks that can support a person's learning goals and career development over a lifetime.

In reality, many schools and colleges forbid the use of mobile phones on their premises, thereby forcing some teachers to use them in their classes in a clandestine way. Clear institutional policies are needed, and students who only have experience of using mobile phones for social reasons need instruction in how to use these tools responsibly for education. Integration of mobile learning with institutional learning management systems, or virtual learning environments, is equally important.

KEY ADVANTAGES OF USING MOBILE AND WIRELESS TECHNOLOGIES IN EDUCATION

Benefits for learners

Improved access to education

- Use of relatively inexpensive everyday technologies
- Better opportunities to acquire skills at one's own pace, with a degree of privacy that may be missing when using shared computer facilities or relying on equipment belonging to somebody else. This is particularly important for women and girls.
- Good support for preferred modes of interaction, e.g. accessing audio content or participating in social networks on the move.

Relevance to authentic learning needs

- Catering for interests beyond what is provided in class, through access to additional content such as podcasts or free learning materials (e.g. OpenLearn [1])
- Handheld devices are often an everyday part of business, so learning can contribute directly to enhancing employability, life skills and work practices

Support for vital communication

- Opportunities for learners to give immediate feedback on their learning experience
- Better assessment and diagnosis of learning problems as they occur
- Psychological support for those at risk of dropping out, through social networks or personal guidance from a mentor

Benefits for educational establishments

Attracting underserved populations of potential students

- Learning materials can become accessible to a larger audience, through podcasts, mobile applications, blogs and e-books, which are seen by potential students
- Catering for disadvantaged social groups for whom mobile learning presents an opportunity to improve their life chances

Improving teaching quality

- Revitalizing the curriculum, rethinking teaching methods and implementing improved feedback to learners
- Turning geographically dispersed learners into a valuable teaching resource by enabling them to contribute their local knowledge and research data more easily
- Supporting learner retention, progression and transition

Supporting continuing education

- Making the learning experience more tailored to the changing needs of individuals, encouraging learners to return for knowledge updating and further study

Benefits for education systems nationally and internationally

- More equitable access to education, for those suffering exclusion for social or economic reasons
- A culture of lifelong learning; learners taking part in organized education but also habitually using personal technologies to support inquiry and knowledge building whenever the need arises
- A culture of life-wide learning, whereby individuals recognize the value of learning in unconventional or everyday contexts and are enabled to realize the full breadth of their potential contributions to society
- A stronger global, intercultural perspective, fostered by increasing learner mobility which thrives on unconstrained access to learning resources and flexible study

KEY CHALLENGES AND LIMITATIONS

Finance challenges

Approaches to the implementation of mobile learning have included sponsorship from device manufacturers which has enabled organizations to provide whole cohorts of learners with devices. Whilst this is useful as a springboard, it raises issues of ownership and sustainability. Recent thinking favours use of learners' own devices or assisting them to buy an inexpensive device.

Management challenges

Educational establishments face the challenge of persuading educators that mobile technology is a serious option for education rather than a gimmick. Established educators resent the loss of control implied by mobile learning activities that are learner-led and take place outside the classroom. Uncertainty about digital content rights management may inhibit production of mobile-friendly content. Development of mobile applications requires upskilling or employing specialist staff.

Competence challenges

Educators often lack the competences required to develop mobile learning opportunities for their students. Conventional assessment or evaluation practices are put under scrutiny as mobile learning may call for different outcomes. Learners may be familiar with mobile devices in general but not as learning tools. Educators may not feel competent to support learners who are primarily focused on real-life learning, and those who expect mobile learning to cater to their individual preferences or needs.

Usability challenges

The need to keep a mobile device charged for longer periods of use remains an issue. Small screen size can limit activities such as reading, although many learners are content to read in this way. Costs of connectivity must be considered alongside the cost of the mobile device, as both teachers and learners perceive this as a barrier to widespread use. Environmental factors such as sunshine and rain impact on the practicality of learning outdoors (OLPC [2]). Unwanted noise and interruptions can impact on the quality of learning in public areas and when travelling.

Constraints on mobile learning in rural areas

Well established broadband technologies such as DSL (Digital Subscriber Line) which use telephone lines, and Cable Internet, which uses the cable television infrastructure, are less prevalent in areas of low population density. Wireless Internet Service Providers provide broadband built around wireless networking, however hotspots are small so coverage is sparse unless roaming is used. Satellite Internet has the ability to provide broadband on a truly global basis but is also amongst the most expensive. WiMax is expected to become the most dominant broadband technology in rural areas in the near future, largely due to its low cost of deployment.

Possible negative consequences of the use of mobile technology in education

With excessive use of mobile technologies, human relationships can become compromised and stress levels, or feelings of overload, can rise. Pervasive use of mobile devices may entail loss of privacy and attacks on personal security. Mobile learning requires some financial investment and teacher training. From a pedagogical perspective, education can become trivialized if it is reduced to learning nuggets and a 'grazing' ethos whereby real depth of understanding is no longer valued.

MOBILE LEARNING FOR SUSTAINABLE DEVELOPMENT

Educational viewpoint

Mobile learning has often been project-based, often with an innovation agenda and funding for a short period of time (with some notable exceptions, e.g. EIA [3]). This has resulted in an inability to study the long-term impacts of mobile learning. Sustainable mobile learning must situate projects in a long-term vision and seek to embed it in educational designs and practices.

Economic viewpoint

Some initial investment seems inevitable in this transitional phase when the Internet is not yet mobile-friendly and pedagogical designs for learning have difficulty keeping up with technological change. However, compared with acquisition of fixed computers and servers, mobile devices offer a relatively inexpensive way to support digital learning.

Environmental viewpoint

Cell phone proliferation has become a hazard. It is not uncommon for people to upgrade to a new cell phone every year, and only a small percentage of these phones are disposed of safely, whilst many end up in landfill sites. Schemes to recycle phones and reward users for long-term use have had some success although more needs to be done to raise awareness and propose solutions.

Technology viewpoint

A relatively cheap and simple cell phone, or an mp3 player, can be used in many effective ways to support learning. Sophisticated mobile and location-aware technologies will continue to be developed, and the latest device designs are superior to previous generations in terms of visual appeal, usability and multi-functionality, as well as the ability to use the latest interactive applications.

Ethical viewpoint

Learners who cannot afford the latest generation devices should not have to content themselves with old devices, perhaps discarded by others. Concerns that prolonged mobile phone use may be a risk to health should continue to be taken seriously, although many applications are data-driven and do not require learners to have a cell phone next to their head for long periods of time.

BEST PRACTICES IN TEACHING AND LEARNING

Individual and mass education

Mobile learning works best when used to support learner-led inquiry, communities and social networks, work-based, field-based and game-based learning, continuous reflection, as a way to collect evidence of achievement, to promote social inclusion and to sustain lifelong learning (e.g. MOTILL [4]). Learners should be encouraged to collaborate with teachers to define how a mobile device can best support their learning, and to share this knowledge with others. By attending to the needs of learners with disabilities, learning provision is also improved for those who have hidden disabilities and those who learn more effectively when material is presented in alternative ways (EU4ALL [5]).

In mass education, mobile learning should be used to support wide-scale literacy and numeracy increase and teacher training. It can improve classroom interaction by giving learners the chance to communicate their ideas by texting or responding to surveys through their mobile phones, which helps to overcome shyness and leads to improved participation. It can also be used to offer a personalized learning experience within a large group. Mass distance education can be enhanced by using mobile devices as an additional means of contact and a way to capture experiences and data from different parts of the globe.

Teacher training

Teacher education for mobile learning should cover mobile pedagogy as well as some technical training to build confidence. Teachers need opportunities to use mobile technology for personal learning and preparation of teaching materials, and to share resources and practical case studies (TESSA [6]). Informal mutual support pairings and networks are beneficial, since access to technical assistance may be difficult in remote locations and these structures also help teachers keep abreast of rapid developments in technology and pedagogy.

Gender-related and child education

Mobile devices appeal to girls and women as well as boys and men, although they may favour different activities. Mobile learning supports empowerment of underprivileged, marginalized groups, particularly women and children in rural areas. Developing literacy and numeracy skills leads to reduced dependence on others. For example, women can take part in mobile learning programmes which enable them to receive text messages on the phone to practise their reading and writing. Mobile games have been used by children and elders in rural areas in India to learn the English language.

Learners with disabilities

The organizer functions usually included in mobile devices are useful for those with learning difficulties, to help them organize their lives and achieve some independence if relevant. Dictionaries downloaded to mobile phones or games consoles, are helpful as reference tools for learners with dyslexia and other learning difficulties. Text-to-speech conversion and voice recognition are valuable for users with disabilities or learning difficulties (Excellence Gateway [7]).

INSTITUTIONAL RESPONSES AND POLICIES

Institutional responses may treat mobile learning as a subset of e-learning but this approach is limiting when it does not recognize the unique characteristics of mobile learning. Institutional responses to emergent technologies should consider five perspectives (according to JISC Report [8]):

1. Rules and regulations

Key policies will concern use of mobile devices on institutional premises and setting expectations about ownership and use.

2. Roles and responsibilities

It may be necessary to train staff or to employ people with relevant experience in technical support or development. Experience of mobile pedagogies needs to be bought in or developed internally.

3. Rewards

Extra effort associated with the adoption of mobile technologies should be rewarded through appropriate forms of recognition and reward.

4. Relationships

Influencers and champions will help spread the word about the effectiveness of mobile learning. Semi-formal networks are good ways of sharing case studies and best practices.

5. Routines

The introduction of mobile technology may provoke resistance or uncertainty. New routines need to be defined to smooth the path during the process of change.

FUTURE DEVELOPMENTS

Mobile devices will continue to penetrate all aspects of life and mobility will become one of the defining characteristics of increasing numbers of learners. Informal mobile learning has great potential in areas such as health education, personal health monitoring, active citizenship, interest in environmental issues and language learning. Participative approaches such as crowdsourcing, i.e. using the power of large numbers of mobile device users to collect and visualize global data that can then be used in teaching and learning, will become more commonplace. Cloud computing will facilitate mobile management of personal and shared learning resources.

Schools often forbid use of mobile phones and other devices but it seems unlikely they will be able to sustain this approach. There will continue to be scope for targeted use of mobile technologies to achieve aims such as raising standards of literacy and numeracy and in response to other major global challenges as they arise. The future of mobile learning includes deployment of context-aware technologies which will use learners' movements, trajectories and preferences to improve access to appropriate resources in the settings in which they are most useful.

SUGGESTIONS AND RECOMMENDATIONS

There is an exceptionally good alignment between the benefits of mobile learning and the goals of Education for All. However a number of actions need to be taken by those who are able to influence the development of mobile learning:

- Recognize the value of learning in unconventional, informal or everyday contexts and enable learners to realize the full breadth of their potential contributions to society
- Enable geographically dispersed, disadvantaged learners to become a valuable teaching resource by providing mobile technologies to help them share their local knowledge and expertise
- Invest in further development of mobile pedagogies that are distinct from e-learning
- Fund further research on mobile learning, particularly longer-term and larger-scale studies that are focused on vital educational goals, and those that explore orchestration of out-of-school learning
- Work with educational institutions to develop workable mobile learning policies
- Train teachers, to raise awareness, build confidence, and impart new skills and knowledge for the redesign of existing curricula and forms of assessment
- Reward teachers for becoming life-long and life-wide learners themselves through their personal use of mobile technologies to reflect on their teaching practices and to extend their knowledge
- Promote and develop innovative donor initiatives to assist with the costs of introducing and sustaining mobile learning among the most vulnerable and underserved populations
- Work with telecommunications companies to enable more affordable mobile access and Internet browsing
- Work with publishers of learning materials to develop business models that will allow more flexible and lower-cost or free access, remixing and reuse on mobile devices

RESOURCES

1. OpenLearn – Repository of free learning materials at The Open University,
<http://www.open.ac.uk/openlearn/home.php>
2. OLPC – One Laptop Per Child initiative,
<http://laptop.org/en/>
3. EIA – The English in Action project in Bangladesh,
<http://www.eiabd.com/eia/>
4. MOTILL – Mobile technologies in lifelong learning: best practices,
<http://www.motill.eu>
5. EU4ALL – Technology-enhanced learning accessible to all,
<http://www.eu4all-project.eu/>
6. TESSA – Teacher Education in Sub-Saharan Africa,
<http://www.tessafrica.net/>
7. Excellence Gateway – Advice on accessibility for learners with disabilities,
<http://www.excellencegateway.org.uk/>
8. JISC. *Institutional Responses to Emergent Technologies*. Landscape Report. 2010.
<http://jisciret.jiscinvolve.org/wp/landscape-report/>

The key objective of this policy brief is to sum up the ways in which mobile-supported learning can contribute to the global commitment to provide quality education for children, youth and adults, as expressed in the goals of Education For All (EFA). Consequently, the brief is particularly concerned with issues of equitable access to education, quality of learning resources, literacy, numeracy, essential life skills and lifelong learning. Opportunities for girls and women are highlighted. Suggestions and recommendations are made regarding strategies for the introduction and sustainability of mobile learning.

Author: Agnes Kukulska-Hulme

Published by the UNESCO Institute
for Information Technologies in Education
8 Kedrova St., Bldg. 3
Moscow, 117292
Russian Federation
Tel: +7 (499) 129 29 90
Fax: +7 (499) 129 12 25
E-mail: Liste.info.iite@unesco.org
iite.unesco.org

© UNESCO Institute for Information Technologies in Education, 2010
Printed in the Russian Federation