Mobiles in the workplace

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The 21st century workplace is changing rapidly. Global competition for advanced knowledge and skills development coupled with societal changes are creating new demands in the workplace. In response, business practices and processes are rapidly evolving leading to changes in the places and times of work, increasing workloads, and greater workforce mobility. Furthermore, mobiles have penetrated the business world opening the door to new approaches for workforce development, across various contexts and career paths. This article examines mobiles for enriching work-based learning practices and supporting performance for those already employed in the business sector. The next section introduces the use of mobiles before progressing to a discussion on informal learning in the workplace. The latter sections focus on work-based mobile learning approaches with selected case studies, affordances and constraints, and recommendations for practice.

Mobile use in the workplace

In the evolving workplace, employees are expected to acquire knowledge and develop skills to perform their jobs well and sustain a competitive advantage. However, budget and time constraints, a mobile labour market, and work-life balance demands are creating challenges for the delivery of traditional work-based education and training. These limitations have given rise to mobiles as the vehicles for workforce development across different locations and times.

Towards Maturity[1] reports the following on mobile use in the workplace from 538 learning and development professionals spanning a range of 28 industries and 44 nations:

- 71% of respondents used mobile devices but this proportion rose to 83% of top learning companies.
- Highest use of mobile devices in the private industry sector included commercial training providers (90%), manufacturing, science, and engineering (79%), professional and technical services (72%), and finance and insurance (69%).
- There is little difference in the uptake of mobile devices for learning amongst those working in not-for-profit (74%), public (73%), and private (69%) sectors. Organizational size had little effect on mobile use.
- More single site organizations (79%) used mobile devices for learning than multinational organizations (72%) or multiple location, single nation organizations (67%).

Mobiles can facilitate seamless learning but also provide decision-support tools for enhancing workplace performance. Like a Swiss army knife, they are very portable and compact providing a readily accessible and adaptable toolkit. This toolkit can also be used offline, when there are connectivity or bandwidth issues, as in remote/rural areas or during airplane travel to access previously downloaded e-books, translators, mobile apps, or other tools. Based on the mobile type, this convenient toolkit can include the tools shown in Figure 5.1.

Figure 5.1: For many, mobile devices are the "most critical work device"

Informal learning in the workplace

The workplace is a rich context for both formal and informal learning. Traditionally, work-based education and training has been delivered in a teacher-controlled face-to-face format including on-the-job training for vocational education and training (VET), continuing competence, and professional development (PD). However, the on-going feasibility of this delivery mode is questionable. Informal learning has emerged as a critical element for advancing today's workforce development.

Informal learning focuses on practical and everyday knowledge gained from experiences with family/friends, leisure, and work, and includes the following types:

1. self-directed learning that is intentional by the learner;
2. incidental learning (unplanned learning that becomes conscious to learner only after the experience);
3. tacit learning (neither intentional nor conscious that corresponds to a sense of knowing or intuition and is often difficult to articulate by the learner)[2].

In the workplace, most learning is informal in nature and forms a part of everyday work activities. Although the employer may be the impetus for some informal learning, most is self-directed and learner-motivated for knowledge acquisition and skill development. These learning experiences can be enabled and supported by work-based mobile learning.

Work-based mobile learning

The dynamic workplace has created demands for innovative learning practices. In response, work-based mobile learning has emerged as a new and rapidly expanding field of practice combining work-based learning and mobile learning approaches.

Work-based mobile learning is:

> *"... the processes of coming to know, and of being able to operate successfully in, and across, new and ever changing contexts,*

including learning for, at and through work, by means of mobile devices."[3]

As Pimmer and Pachler suggest, this definition ties the affordances of mobiles in *real* workplace situations for mobile learning to the aspects of work-based learning that include:

- *Learning for work* – where learning occurs "off-the-job" and is preparatory or "just-in-case" for future application;
- *Learning at work* – "just-in-time" learning that occurs at the workplace and is immediately relevant;
- *Learning through work* – learning that occurs through work experiences as in social learning that connects learners.

Work-based mobile learning can occur, synchronously or asynchronously, to actively engage employees in the learning process. Mobiles are more widely used for work-based informal learning than formal learning. This is particularly prominent in resource-limited small and medium businesses. Mobiles also provide 'performance support', taking some cognitive load from workers.

Work-based mobile learning approaches

This section provides an overview of work-based mobile learning approaches beginning with the formal delivery method moving to the more widely used informal approaches. Each approach is illustrated with a selected case study.

Formal work-based mobile learning

In formal work-based mobile learning, learners participate using their mobiles in the classroom, or existing eLearning course content is converted to fit handhelds. Either way, the focus is mainly on a teacher-centred instruction for learning to be used at a later time. The delivery is pushed out from the teacher or the learning management system (LMS) to the learner. It is often used for compliance training and on-going competency requirements, as depicted in Box 5.1.

"Just-in-Time" work-based mobile learning

Moving away from teacher-led approaches, "just-in-time" learning is self-directed at point-of-need as in Box 5.2. For example, healthcare workers can access short medical videos, medical apps, or other mobile resources for constructing spontaneous knowledge, reduce uncertainty, and increase self-confidence when faced with unfamiliar procedures or situations. Likewise, time-starved business executives can pull immediate mobile information whenever and wherever they are situated to engage in informal learning for timely decision-making.

Additionally, mobiles can support individual performance with on-demand access to employer's job aids such as checklists, procedural information, price lists, product specifications, or other documents so that employees can retrieve them anytime or anyplace.

Social learning in work-based mobile learning

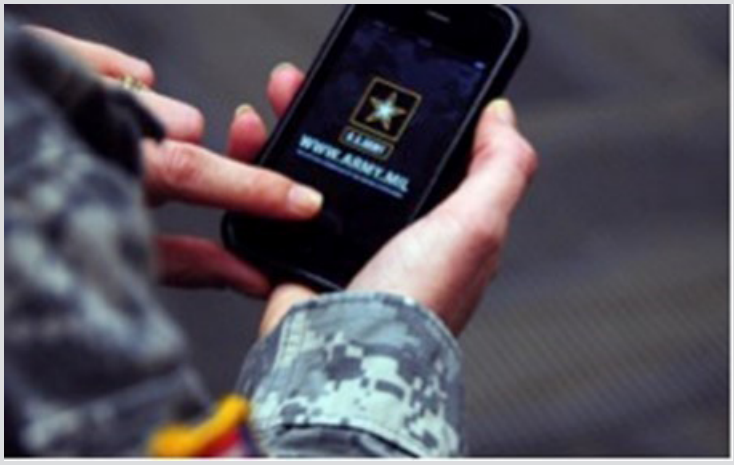
Although much of work-based mobile learning occurs individually, it can also connect employees through social interaction, build mutual understanding, and create new contexts for learning in communities of practice. Employees collaboratively learn by sharing practical and professional experiences, problem solving, and providing peer-to-peer feedback that may draw on deep tacit knowledge and leverage employees' knowledge exchanges. They can interact using emails, text, and phone but also use tools such as blogs, wikis, and Twitter, and social networking sites including LinkedIn, Facebook, or MySpace. The case in Box 5.3 illustrates mobile social learning for problem solving and increasing the transparency of employee's competency profiles.

Box 5.1: Conversion of eLearning course: Case from US Department of Defense

The US Department of Defense converted an eLearning course for mobile delivery for active duty military, civilians, and contractors. With the original eLearning course, learners were often challenged to complete the compulsory training requirements while dealing with distractions and attempting to balance mission-critical work responsibilities. The course was reformatted using HTML5 for the users' smartphones and tablets. Flash animations were converted to static images, graphics were refined to reduce bandwidth, and some redundant content was removed to reduce size in the mobile version.

Benefits reported by learners on the mobile version included:

- reduction in time to complete the course from approximately 40-60 minutes in the eLearning course to less than 30 minutes with the mobile version;
- more concise information, convenience, and training with no distractions;
- high level of satisfaction with the mobile version, preferring it to eLearning.



The U.S. Army - Official Army iPhone app

Photo credits: Todd Lopez. Wikimedia Commons / Public Domain.

Source: Haag, J. (2011). *From elearning to mlearning: The effectiveness of mobile course delivery*. 1st ed. [pdf] Alexandria: VA Advanced Distributed Learning Initiative. Available at: https://adlnet.gov/adl-assets/uploads/2015/11/e_to_mLearning_paper.pdf Accessed 20 Nov. 2016.

Box 5.2: "Just-in-Time" learning: Case from Jaguar Land Rover

Jaguar Land Rover exports vehicles to franchises in 169 countries. Based on this global distribution, it was determined that mobile learning was needed to deliver training and resources to nearly 60 000 employees' personal devices in multiple languages. Mobile Application Management (MAM) was used to deliver content in all languages, with the ability to remotely lock or wipe all corporate data off any device at any time from any location.

Employees accessed mobile videos, product data sheets, and product specific apps at point-of-need for decision-support and/or seamless learning in their jobs. For example, mechanics could pull just-in-time resources when doing repairs. LMS integration tracked content interaction and objectives, and any updated content could be pushed out to the learners providing them with a personalized library.

Employees using mobile resources while doing repairs

Photo credits: The Repair Association: https://repair.org/

Source: Wigley, A. (2013). Considering Mobile Learning? A Case Study from Jaguar Land Rover. *Development and Learning in Organizations*, 27 (4), pp.12–14.

Box 5.3: Social learning in work-based mobile learning: Case from a British career advising business

A British career company implemented semantic people tagging with 60 geographically distributed employees. Due to the wide distribution, there was a knowledge gap about overall employees' expertise, skills, and competencies but also emerging career topics for advising clients.

A mobile app was developed for a shared directory and vocabulary with a real-time editor to tag or bookmark colleagues. Employees tagged each other without restrictions and the taggers remained anonymous; no external organizational colleagues were tagged. Assigned tags were immediately visible by all employees. Socio-cultural organizational aspects were taken into account due to the sensitivity of people tagging. The tagging system was well received, achieving the following outcomes:

- increased learners' control and empowered them to contribute to a shared knowledge base;
- simplicity and ease-of-use provided access and networking to more expertise and information

Hot topic: Texting at work!

Photo credits: Mid-Continent Public Library. Available at: www.mympl.org/blog/hot-topic-texting-work

Source: Braun, S., Kunzmann, C. and Schmidt, A. P. (2012). Semantic People Tagging and Ontology Maturing: An Enterprise Social Media Approach to Competence Management. *International Journal of Knowledge and Learning*, *8*(1), pp. 86-111.

Creating and sharing in work-based mobile learning

When employees create and share work-based mobile learning resources, it promotes peer-to-peer learning, active knowledge construction, and skills and vocational identity development within a learning community. Whether it be creating and sharing a video, audio recording, or other job-related resource, it's a bottom-up and learner-centred approach. As the next case discusses (Box 5.4), creating and sharing work-based mobile learning resources can empower and engage disenfranchised learners but also foster leadership skills for upward mobility.

Box 5.4: Creating and sharing: Case from indigenous Australian park rangers

Situated in Northern Australian, this four-year project focussed on workforce development of indigenous park rangers' knowledge and skills in plant biosecurity management. Formal educational approaches had limited success in meeting their needs. Computers and Internet access was limited in these remote rural communities but the rangers' mobiles were always with them. Therefore, handhelds were used to engage disenfranchised learners in indigenous workplace learning.

Using mobiles, five indigenous rangers co-developed learning resources to document work practices. Multilingual digital stories using visual images of the rangers and their field equipment plus audio-recorded instructions were produced for collegial sharing and reuse when doing specific tasks, inducting new staff, or as refreshers from previous training.

The rangers controlled workplace-learning processes and ensured cultural knowledge was maintained. The digital resources connected the learners in their own contexts and provided evidence of vocational competence, expertise in the field, and demonstrated their value as workers. This learning approach empowered the disenfranchised indigenous rangers as they assumed leadership roles in constructing knowledge, enhancing their vocational identities, and promoted peer-to-peer learning through situated experiences and social interactions.

Aboriginal rangers trying out the new I-Tracker applications

Photo credits: Coastal First Nations. Available at: http://coastalguardianwatchmen.ca/sites/default/files/Australia%20Newsletter.pdf

Source: Wallace, R. (2011). The Affordances of Mobile Learning that can Engage Disenfranchised Learner Identities in Formal Education. In: N. Pachler, C. Pimmer and J. Seipold, eds., *Work-based Mobile Learning: Concepts and Cases,* 1st ed. Oxford: Peter-Lang. pp. 117-144.

Bridging informal and formal work-based mobile learning

Mobiles can bridge the gap between informal learning experiences and work-based mobile learning, formal education and training for a blended approach. This allows for differentiation but also personalization of the employee's learning, either individually or collaboratively.

Individually, an employee may reflect on informal learning experiences in relation to their work-based formal learning, using an e-portfolio, blog, or other mobile modes. Managers can mentor an employee at a distance to provide timely support and feedback on their informal learning experiences for decision-making and PD. Mobile mentoring may also have cost implications related to reducing the need for face-to-face meetings and increasing the number of employees a manager could mentor.

Collaboratively, employees can engage in social learning using their mobiles where they interact and share work experiences building on their previous formal work-based mobile learning. The case from the developing country of Peru illustrates bridging informal and formal work-based mobile learning (Box 5.5).

Work-based mobile learning affordances and constraints

The workplace provides a learning environment with competing affordances and constraints for work-based mobile learning, generated from perceived needs of the business organization and also individual employees. As outlined in Table 5.1, the potential affordances of WBML enable learner participation while the potential constraints impede the effectiveness of work-based mobile learning.

Table 5.1: Learning affordances and constraints

Potential Affordances	Potential Constraints
Learning & skills development in businesses where access to computers may be limited	Workplace cultures that are reluctant to change learning practices & adopt mobiles for workforce development
Flexibility, convenience, & learner control over time for learning whether it be in the office, field, or other locations	Lack of educators & trainers with the knowledge & skills to support & facilitate WBML
Potential to increase multi-generational learner motivation, engagement, & performance from WBML opportunities	Lack of managerial support due to the blurring of mobile device boundaries for personal and work use
Facilitation of employee learning for those who are difficult to access due to the changing nature of work, roles, & decreasing opportunities for face-to-face education & training	Challenges with selection & costs in the provision of employees' mobile devices & content in their work settings
Enhancing personalized & contextualized learning in different locations; reducing limitations for learning & improving performance for lateral or upward mobility	IT & security issues including interoperability with different mobile platforms, limited connectivity & bandwidth in remote/rural areas, & employees bringing their own devices in the workplace (BYOD)
Boosting cost-savings as a result of increased efficiencies & quality of learning processes supported over time & distance	Ethical issues related to confidentiality, privacy, & security of data captured on mobiles

Box 5.5: Bridging informal and formal WBML: Case from Peruvian HIV/AIDS training

Twenty doctors working in clinics with limited access to HIV/AIDS teaching resources participated in WBML. Their previously identified PD challenges included lack of access to training, training not meeting regional needs, limitations in the development of health personnel competencies, and high turnover rates of trained healthcare workers.

A formal HIV/AIDs education program was developed and delivered via supplied smartphones incorporating 3D learning scenarios simulating interactive clinical cases. Portable and inexpensive solar chargers facilitated wireless connection to download materials and Internet access. A mobile platform supported the learning events, tracked doctor's progress, and provided Facebook access for social learning, peer-to-peer sharing of experiences, and networking with experts. From the module discussions, smartphone accessible learning resources were created.

In this resource-limited setting, the main WBML affordances identified were:

- freedom to plan personalized educational activities;
- quality of information received, applicability of the content to clinical practice, and the appropriate relevance of the learning resources;
- equipment portability and easy access to content at the time/location of choice.

Constraints were costs for the handhelds, service fees, and the need for IT support for troubleshooting, all of which may impact widespread use.

The use of cell phones grew 7 percent in rural areas of the country

Photo credits: Living in Peru. Available at: http://archive.peruthisweek.com/news-15363-business-use-cell-phones-increases-7-percent-rural-areas-peru

Source: Zolfo, M., Iglesias, D., Kiyan, C., Echevarria, J., Fucay, L., Llacsahuanga, E., de Waard, I., Suàrez, V., LLaque, W.C. and Lynen, L. (2010). Mobile Learning for HIV/AIDS Healthcare Worker Training in Resource-limited Settings. *AIDS Research and Therapy*, [online] 7(1), pp. 35-40. Available at: http://aidsrestherapy.biomedcentral.com/articles/10.1186/1742-6405-7-35/. Accessed 20 Nov. 2016.

Conclusions and recommendations

There is no one-size-fits-all work-based mobile learning approach. As examined in this article, work-based mobile learning provides a multifaceted learning approach for knowledge acquisition, skills development, and performance support for effective and efficient workforce development across different contexts and career trajectories. Therefore, the following recommendations should be considered when implementing work-based mobile learning for enhancing rich learning experiences and promoting best practices:

- Embody visionary leadership with a clear strategy for work-based mobile learning that includes collaborative stakeholder communication at all levels to optimize workforce development.
- Select and/or develop mobile content but also encourage creation, sharing, and collaboration of mobile resources to enhance informal work-based mobile learning and support performance.
- Scrutinize the technological affordances and constraints of work-based mobile learning to determine the best mobile fit for the workplace and employees.
- Incorporate on-going managerial, learning and development, and technical support for work-based mobile learning sustainability.
- Develop work-based policies, protocols, and advice to ensure confidentiality, privacy, and security of data captured on mobiles in the workplace.

Endnotes

1 Towards Maturity. (2014). *Mobile Learning at Work.* [online] 2nd ed. [pdf] Available at: http://towardsmaturity.org/shop/wp-content/uploads/2014/06/In-Focus-2014-Report-Mobile-Learning-in-the-Workplace.pdf Accessed 20 Nov. 2016.

2 Schugurensky, D. (2000). *The forms of informal learning: Towards a conceptualization of the field.* 1st ed. [pdf] Toronto: ON University of Toronto. Available at: https://tspace.library.utoronto.ca/bitstream/1807/2733/2/19formsofinformal.pdf Accessed 19 Nov. 2016.

3 Pimmer, C. and Pachler, N. (2014). Mobile Learning in the Workplace. Unlocking the Value of Mobile Technology for Work-Based Education. In: M. Ally, and A. Tsinakos. eds. *Increasing Access through Mobile Learning*, 1st ed. [ebook] Vancouver: BC Commonwealth of Learning and Athabasca University. pp. 193-203. Available at: http://hdl.handle.net/11599/558/ Accessed 18 Nov. 2016.