Article:
Fuller, R and Joynes, VCT (2015) Should mobile learning be compulsory for preparing students for learning in the workplace? British Journal of Educational Technology, 46 (1). 153 - 158. ISSN 0007-1013

https://doi.org/10.1111/bjet.12134

Should mobile learning be compulsory for preparing students for learning in the workplace?

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Abstract

From the contexts of current social, educational and health policy, there appears to be an increasingly inevitable 'mobilisation' of resources in medicine and health as the use mobile technology devices and applications becomes widespread and culturally 'normed' in workplaces. Over the past eight years, students from the University of Leeds Medical School have been loaned mobile devices and smartphones and been given access to mobile-based resources to assist them with learning and assessments as part of clinical activity in placement settings. Our experiences lead us to suggest that educators should be focusing less on whether mobile learning *should* be implemented and more on developing mobile learning in curricula that is comprehensive, sustainable, meaningful and compulsory, in order to prepare students for accessing and using such resources in their working lives.

Practitioner Notes

What is already known about this topic

Mobile learning is acknowledged to have increasing significance in higher education.

The theoretical base for mobile learning is still in its infancy, with a focus on small-scale or pilot studies which do not add weight or evidence beyond the conceptual basis.

As a consequence, there is an understandable caution to wider scale usage in campus and workplace learning environments.

What this paper adds

This paper questions whether we can afford to wait for a theoretical base of mobile learning to develop well enough for each discipline before it is implemented.

Exploring current social, education and health policy the paper questions whether increased ‘mobilisation’ of resources within the workplace is increasingly inevitable, and if so, if we should therefore embrace the concept of mobile learning in a compulsory way.

Implications for practice and / or policy

If the move to an increased emphasis on using mobile resources to learn is inevitable then there is a need to move beyond current debates of ‘how to’ implement mobile learning to ‘why should we not?’ implement it.

Students need to be introduced to skills that will enable them to use mobile learning in the workplace both efficiently and appropriately.

Faculty and institutions need to embrace the benefits of mobile learning both for the benefits of student experience and as powerful repository for scholarship activity.

'Mobilisation': The rise of mobile technology devices and applications in education and workplace settings.

A wide range of evidence from socio-political and educational contexts heralds an ever increasing focus on mobile learning, and points to 'mobilisation' becoming inevitable across the Higher Education Sector. The growth of technology and scale of usage in primary and secondary education predicates a continued rise in University students having already routinely used mobile technology / smartphones in their learning, with an expectation that they will continue to do so throughout their higher education. Increases have been reported in both the use, and calls for the use, of mobile devices in school education in the UK (Shepherd, 2011) with the Department of Education's Summary of Evidence on Technology Supported Learning noting that tools such as audience response systems "generally improve student outcomes", and that technology can be particularly effective when combined with self-paced learning, delivering frequent formative learning while allowing students to learn at their own pace (DfE, 2011). These calls sit within a broader pool of evidence of the growth in smartphone usage, with 60% of mobile phone users in the UK owning a smartphone by the end of 2012 (Sedghi, 2012).

This has been accompanied by an explosion in 'everyday' technology applications across social media, lifestyle and health fields, with analyst estimates that by 2017 there could be 200 billion downloads of apps worldwide per year (Mobithinking.com). This rapid growth in applications has resulted in an increased amount of information being made available to individuals via their mobile phones; in 2012 a study by the Pew Research Centre established that 50% of smartphone owners in America (who themselves accounted for 53% of the population) had accessed health information on their phones (compared to 6% of non-smartphone owners) (Fox and Duggan, 2012). However, while 19% of smartphone owners had an application installed on their phone to help them manage or track their health, only 9% used text updates or alerts to monitor medical issues (Fox and Duggan, 2012). With this study in mind, questions remain about whether smartphone users are being overwhelmed by the scale and scope of choice of applications available as part of their routine use of mobile technology.

The reach of mobilisation in the workplace has been considerable. Electronic health information systems, including health records, have been a priority as part of US health reform agenda in America since 2008, with over half of doctors' offices and 80% of eligible hospitals having adopted such systems by 2013 (UPI.com, 2013). The scale of use of technology has also informed the future ambitions of the UK National Health Service with an implication that clinicians will be routinely using mobile technology as part of their everyday roles. The Secretary of State for Health in England has announced the Department of

Health's vision for the NHS to be paperless by 2018, aiming for wide scale piloting of "fully portable electronic health records" across health and social care by 2015, which is in part now seen as possible because "technology has been mainstreamed into daily lives" (Gov.uk, 2013).

What does this mean for healthcare workers? A survey by d4 of 175 UK doctors established that 82% of them owned a smartphone, and that during a typical shift at work 59% said they used their phones to access information on the internet / intranet and 30% used *work-related* software apps (Nolan, 2011). As the use of mobile devices and applications becomes culturally normalised within workplaces as part of professional life (e.g. calculating drug doses, reviewing algorithms for treatment of health conditions), it is imperative that student learning in workplace settings routinely embraces these resources

What are the implications for Higher Education?

Amongst this wider backdrop, mobile learning is acknowledged to have both increasing significance and visibility in higher education (Ally, 2009; Traxler, 2009). However, the majority of published work on mobile learning remains focused at the level of exploring student attitudes toward using mobile devices in education (Koehler, Yao, Vujovic and McMenamin, 2012; Wallace, Clark and White, 2012) or reporting on interventions involving only small cohorts in pilot studies (Schols et al., 2013). There remains a technology driven primacy in many of these approaches with little evidence of educational theory research underpinning development or delivery. The question of *how* students are learning with these resources appears to be secondary, if asked at all. Higher Education faces the challenge of dealing with expectations of increased mobile usage, whilst simultaneously grappling with a lack of understanding about the processes involved in learning to use mobile technology, let alone using and learning from such technology in workplace settings.

A further dimension is the challenge is the emerging evidence of smartphone user 'saturation' with the sheer range of applications available. This poses challenges for institutions implementing mobile technology usage in programmes, as students (and staff) may feel 'lost' with the range of resources available alongside security concerns as large student and staff cohorts access external material. The responsibility of higher education institutions encouraging the use of mobile devices therefore needs to extend beyond 'how to' use them and encompass how to use them appropriately, professionally, and effectively as learning tools at individual and institutional levels.

Can disciplines which routinely base students in workplace settings for the majority of their learning provide an environment in which to reconcile this challenge? Valuable lessons are emerging from healthcare education, highlighting how information sources on mobile devices have been used by students and junior doctors to augment (rather than replace) existing resources (Hardyman, Bullock, Brown, Carter-Ingram and Stacey, 2013; Davies et al., 2012), recognising the routine usage of mobile technology applications in the healthcare workplace. Nevertheless, these reports are still based on initiatives where participation was voluntary. A significant limitation of such studies is that they suffer both from selection bias and the exclusion of students and doctors who were not interested in attempting to use mobile technology or unable to access smartphones because of financial constraints.

If this move to a 'mobilisation' of resources appears increasingly inevitable, it is impractical to wait for evidence of success in mobile learning in every discipline. Consequently, we would argue that educators in practice placements and workplace learning areas should be attempting to develop mobile learning curricula that are comprehensive, sustainable and meaningful. In order to achieve this, should mobile learning and assessment be made compulsory in order to better prepare students to use mobile resources as part of their working lives?

Making the argument for large scale, compulsory mobile learning. A case study

Evidence within healthcare education transpires from two major initiatives that have examined large-scale use of mobile devices for undergraduate student learning in clinical workplace settings. The Assessment and Learning in Practice Settings (ALPS) Centre for Excellence in Teaching and Learning (CETL) was a large-scale programme of work involving five higher education institutions and sixteen health and social care professions (Dearnley, Haigh and Fairhall, 2008). A key strand of the ALPS CETL was a focus on supporting students in the workplace by the use of technology enhanced learning resources. The programme provided mobile devices to student groups in all professions, and the resources and support systems that were developed during the programme focused on learning at work. Evidence gathered during the course of the programme included the fact that student engagement with mobile learning was maximized when students felt that they had 'ownership' of the devices they were using, and when the learning requirements were a compulsory rather than optional part of their course (Davies, Joynes and Walker, 2010).

Following on from the success of ALPS, The University of Leeds School of Medicine has provided medical students with a suite of mobile resources for both learning and assessment designed for use in clinical practice over the last five years. The first phase of the

programme provided iPhones provided to all fourth and fifth year students to enable them to access these resources as a compulsory aspect of their undergraduate study. This was developed in partnership with students, with the emphasis placed on what students and faculty needed to enhance their workplace learning experiences. This programme of work reflected the socio-political signals that the focus on resource development should be about what increased 'mobilisation' can *add* to the student learning experience rather than what it can *replace.*

One of the primary outcomes of this mobilisation has been a significant improvement in engagement with mandatory workplace assessments, with the development of a mini-CEX (clinical examination) mobile application. The use of the mini-CEX in other formats is well-proven (Hauer 2000; Kogan, Bellin and Shea, 2002; Norcini and Burch, 2007) and the development of the resource into a mobile format generated a cycle of increased student participation (beyond mandatory requirements), supervision in clinical practice, assessment opportunities and the collection of feedback and subsequent reflection. Early outputs from this work with students undergoing programmes of remediation resulted in students feeling that they had opportunities to approach clinicians to discuss their progress in ways they had not felt able to previously (Coulby, Davies, Hennessey and Fuller, 2011). The use of this feedback process was introduced incrementally, firstly with students on a remediation placement, then into one workplace placement for all students in year four, and then as compulsory for all students in penultimate and final years of study.

Simultaneously, curricula-relevant learning materials were provided to support students in the workplace (overcoming difficulties with access to computers in workplace or absent internet access). Students and Faculty were consulted to agree on core resources that would have value across the programme of study (with clinical handbooks and drug formularies used repeatedly across multiple placements). Providing such resources (software and smartphones) has required considerable investment effort and finance (in the 2012/13 academic year the total cost of providing the device, with resources was £25 a month per year per 4th and 5th year student), but this has been viewed as worthwhile in the resultant benefits to student learning experience and scholarship opportunities.

Compulsory participation with the mobile programme of learning has generated a high volume of cohort activity. Work from the 2011-12 final year cohort showed students undertaking more assessments than required by the programme, a sustained rise in the quality and content of feedback and an opportunity to monitor 'which' faculty were undertaking supervision and assessment, reflecting the outcomes from a similar approach to workplace based assessment (Playford, Kirke, Maley and Worthington, 2013). This work

has also suggested a predictive validity of engagement with our mobile programme and high stakes assessment success. Results from our current research with students and clinical staff undertaken in 2013 indicate that students are using their devices daily to access learning resources, and are using resources to fill in 'dead time' in placement settings and while travelling. This is not only improving workplace learning experiences but typically sees students preparing more for the patients they are just about to see, making the experiences more meaningful and memorable.

Whilst engagement with the mobile programme is compulsory, how students use their resources, and manage their assessment and reflection, is individualized. Current research reveals unanticipated benefits - in terms of allowing students to use their own time differently; rather than returning home with long lists of information to look up after a day out in placement (as they had previously experienced) students are accessing information throughout the day, freeing up their spare time for revision and non-curricular activities. There is also evidence that students are learning to access other resources in a meaningful way; exploring 'free' apps and learning materials available to them, but triangulating these with university provided resources and feedback from peers and professionals about reliable data sources.

The combined result of our experiences and mounting evidence for an increased emphasis on using mobile resources to learn leads us to suggest that there is a need to now move beyond current debates of 'how to' implement mobile learning to ask instead 'why should we not?' implement it. Students need to be introduced to skills that will enable them to use mobile learning in the workplace both efficiently and appropriately, while faculty and institutions need to embrace the benefits of mobile learning both for the benefits of student experience and as powerful repository for scholarship activity. Simultaneously, more scholarly enquiry is needed to generate evidence about how students are learning with these resources, and how to develop effective frameworks to enable the 'best' student learning experience.

Acknowledgements

The authors wish to thank Professor Trudie Roberts, Gareth Frith and Nancy Davies for the various contributions they have made to the mobile learning programme within the Leeds Institute of Medical Education.

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