

# Can mobile learning work when work-based learners prefer laptops?

Stan Lester

*Stan Lester Developments, UK*

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## Abstract

The use of digital mobile devices for learning has become more commonplace over the last 15 years or so, and some effective strategies are being employed across a variety of occupational fields that use them for learning in the workplace. The case under consideration concerns a recently-formed English police education consortium that provided tablet computers to learners on degree-level entry programmes. As the programmes progressed it was apparent that the devices were being used less than expected, and a study – based on a literature review and an online questionnaire – was carried out to identify issues and make recommendations for future practice. The survey found that the majority of learners preferred using laptops to tablets for most purposes, owing to the larger keyboard and screen and the greater versatility offered. Mobile devices do however offer advantages over laptops for in-the-moment learning and communication as opposed to more traditional e-learning and academic work, although phones may be preferred over tablets. If mobile devices are to be provided, mobile learning needs to be designed as an integral part of the programme using activities that play to the strengths of the devices and fit into the flow of work. It needs to be integrated into the working culture and supported by workplace supervisors and mentors. Thought also needs to be given to the type of device that is appropriate and whether supplied or learners' own devices are used.

## Introduction

'Mobile learning' – in the sense of learning that makes use of digital mobile devices – has been explored and used in various ways in the context of learning at and through work (e.g. Trede *et al*, 2016; Dimond *et al*, 2016; Virnes *et al*, 2017; Kim & Park, 2019; Butler *et al*, 2020). This study explores the success or otherwise of providing mobile devices as learning tools in higher-level apprenticeship-type programmes in the UK, principally the Police Constable Degree Apprenticeship (PCDA) and the police Degree Holders' Entry Programme (DHEP).

The PCDA and DHEP are two of the three main routes to becoming a police officer in England and Wales. They form part of the degree-level Police Education Qualification Framework (PEQF) introduced by the College of Policing from 2018 onwards in response to demands for a more professional and modern police service (College of Policing, 2020). The PCDA is for entrants without a degree and runs over three years with input from the employing police force and from a higher education institution. The DHEP is a two-year programme covering equivalent ground for graduates, leading to a level 6 (bachelor's degree level) diploma; unlike the PCDA it also offers an option to specialise in detective work from the outset. The third route comprises a full-time degree in Professional Policing followed by two years of training without university input. All the PEQF routes include an initial period of training in the force's training centre followed by experience in different aspects of policing.

In 2019 the Police Education Consortium, comprised of Middlesex, Canterbury Christ Church, Cumbria and Portsmouth universities, began delivery of PCDA and DHEP programmes in partnership with three police forces in England. Both programmes were designed with the aim of integrating work-based and academic learning (Lester *et al*, 2016; Lillis & Bravenboer, 2020), and even before the coronavirus pandemic a 'digital first' approach was agreed to aid integration and move away from a day- or block-release format. As part of this strategy and as agreed in the contract the universities provided each entrant with an iPad (Apple tablet computer). The rationale for this was that firstly it would ensure all learners had ready access to an internet-enabled device, and secondly it would provide learners with a portable device that could be used as a quick reference tool, for recording reflections in the workplace, and to take part in the three-way reviews that form a mandatory part of the programme.

As learners moved through their programmes it was apparent that their use of the iPads was falling off. Various factors were conjectured as contributing to this but the consortium bodies lacked enough information on which to base any changes. To inform future practice, particularly as to whether and which devices should be provided and whether there were any implications for how workplace learning is managed, one of the consortium members undertook a study in 2022 in which the author acted as research consultant. While the purpose of the study was practical and local, it was thought that the results would be of interest to others involved in or considering introducing mobile learning with work-based learners.

## **Methodology**

The study proceeded in two parts: a short literature review on mobile learning conducted in early 2022 and a survey of learners carried out in the summer of the same year.

### ***The literature review***

The literature review was undertaken to gain an understanding of current principles and successful practices in mobile learning, and disseminate them among the consortium. It involved three main searches using Google Scholar<sup>1</sup>:

- (1) 'mobile device' and 'learning', not date-limited (the first 200 short descriptions or abstracts were examined and 17 papers included in the review)
- (2) 'mobile learning' and 'workplace', 2015 and later (200 short descriptions or abstracts including 16 duplicates, 22 papers included)
- (3) 'mobile learning' and 'apprenticeship', 2015 and later (100 short descriptions or abstracts including 17 duplicates, 5 papers included).

Searches were also conducted for more specific information on mobile learning coupled with degree apprenticeships, policing and nursing, returning four additional papers. A further five papers were added from the references of the included papers. The 53 items that were included comprised refereed journal articles (33), conference and non-refereed papers (11), book chapters (4), theses (3)

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<sup>1</sup> Google Scholar was chosen for the wide range of items returned, including conference and practice-oriented papers, balanced with the researcher's confidence in rejecting items lacking quality or relevance.

and research reports (2). They could roughly be classified as case-studies and practice reports (22), other research papers (12), discussions of concepts and models (11) and literature reviews or syntheses (8).

### ***The survey***

The survey was based on a set of categories constructed with general reference to the results of the literature review. It asked questions about the type of device used (many learners chose to use their own or their employers' devices instead of or in addition to the iPads); likes and dislikes about the devices; where they were used and what for; support for mobile learning in the workplace; and what aspects of learning were carried out using mobile or other devices (or non-digitally). It was set up on Qualtrix and sent to 1689 learners, including as a comparator 115 Middlesex Nursing Associate (level 5) apprentices, all first years, who had also been provided with iPads.

## **The literature**

### ***Mobile learning***

Mobile learning as a term has been defined both as the use of mobile devices for learning regardless of place, and as digital learning that is location-independent rather than being confined to an educational institution, home or office. More recently it has come to refer mainly to the use of handheld tablet computers and smartphones (Glover & Rodger, 2018), these having become the most popular portable devices by the early 2010s (Chen & deNoyelles, 2013). However the continuing appearance of new types of device means that definitions need periodic revision (Hockly, 2013), a recent example being the emergence of lightweight, wireless-enabled augmented reality glasses (Hofmann 2018). Some authors therefore emphasise the 'anytime, anywhere' aspect of mobile learning rather than the type of device used (e.g. Motiwalla, 2007; Berking & Haag, 2015; Daughtery & Berge, 2017; Yıldız *et al*, 2020). This provides a better fit with some of the main affordances of mobile learning, which are not device-dependent.

A variety of affordances and benefits of mobile learning have been reported. These are grouped into four main areas below, i.e. convenience, expediency and efficiency, immediacy, and connectivity and collaboration, the first three following the framework put forward by Kynäslähti (2003):

- Convenience, for instance the ability to learn in multiple locations, on the move, between operational tasks and during breaks (Seppälä & Alamäki, 2013; Wilke, 2017; Gaston, 2018; Butler *et al*, 2020; Chen *et al*, 2021).
- Expediency and efficiency, for instance being able to access information and resources at any time, check things out and question veracity in real time, and explore subjects more deeply on demand (Seppälä & Alamäki, 2013; Engelmann & Schwabe, 2018; Lall *et al*, 2019; Yıldız *et al*, 2020).
- Immediacy, for instance being able to take pictures, record videos, make notes and share information 'in the moment' (Seppälä & Alamäki, 2013; Gaston, 2018; Folger *et al*, 2021), as well as 'just in time' learning to get information and support at the point of task performance (Engelmann & Schwabe, 2018; Alajmi *et al*, 2019; Prasad, 2020).

- Connectivity and collaboration, of learners engaged in similar activities (Sophonhiranrak, 2021), of people working on collaborative projects or tasks (Yıldız *et al*, 2020; Prasad, 2020), and of learners and supervisors or tutors (e.g. Virnes *et al*, 2017; Willemse 2018). An important aspect of this appears to be the propensity for mobile learning to promote informal communication beyond the learner's peer group (Pimmer, 2016; Virnes *et al*, 2017; Alajmi *et al*, 2019).
- Seppälä & Alamäki (2013) add a fun element, such as being able to use pictures, emojis and short messages for feedback.

Mobile learning by its nature tends to encourage autonomous, learner-managed, self-paced, interactive and to an extent collaborative approaches, creating a culture of active learning (Glover & Rodger, 2018; Yıldız *et al*, 2020; Chen *et al*, 2021). It often combines online and situated learning (Alajmi *et al*, 2019; Sophonhiranrak, 2021); situation may be in a community of practice as well as a physical location such as a hospital ward (Martin & Ertzberger, 2013; Del Rosario-Raymundo, 2017). Its ability to create short breaks from routine work activity can aid reflection, both individually and in dialogue with others (McCann, 2015). While mobile devices can be used as a means of delivery for learning 'packages', these tend to be broken down into small chunks that make use of the affordances outlined above (Li, 2015; Prasad, 2020).

Studies of mobile learning have on balance reported highly positive feedback from learners, from the viewpoints of effectiveness, immediate application and motivation (Martin & Ertzberger, 2013; Al Saleh & Bhat, 2015; Trede *et al*, 2016); usefulness, convenience and ease of use (Chen *et al*, 2021); and improving communication (Lai & Yen, 2018). Kim & Park (2019) reported mobile learning as having a significant positive influence on nursing students' knowledge, skills, confidence in performance and attitude to learning, while Koohestani *et al* (2018) found a propensity to improve confidence, clinical competence and theoretical knowledge. Various disadvantages and issues are nevertheless reported. The most common relate to the size of the device, with small screens, sometimes limited storage or battery life, and most critically small keypads that make typing difficult (Orok & Usoro, 2015; Tabor, 2016; Alajmi *et al*, 2019; Prasad, 2020; Sophonhiranrak, 2021). Internet connectivity is sometimes reported as an issue depending on location (Willemse, 2018; Sophonhiranrak, 2021; Chen *et al*, 2021). Non-device-related issues in the workplace include distraction from work (Alajmi *et al*, 2019), concerns about being seen as unprofessional (Dimond *et al*, 2016; Trede *et al*, 2016; Lall *et al*, 2019) and organisational disapproval (Mather *et al*, 2018). Individual resistance to mobile learning is reported in only a small minority of instances (Alajmi *et al*, 2019; Butler *et al* 2020).

A few studies have compared mobile learning with using desktop computers, with varying results. Dar & Bhat (2016) reported better performance among IT trainers on a task when using mobile devices compared with computers, and a meta-analysis by Sung *et al* (2016) produced similar conclusions. On the other hand Martin & Ertzberger (2013) found conventional computer-based instruction led to better exam results than 'here and now' mobile learning, although the mobile group was better motivated.

### ***Pedagogical and success factors***

Several authors make the point that, as with digital learning generally, pedagogical and learning design factors are critical for making mobile learning work (Ally, 2004; Motiwalla, 2007; Daughtery & Berge, 2017). Various sets of success factors have been put forward for mobile learning, which can be summarised following Naismith & Corlett (2006) and Butler *et al* (2018) as:

- Accessibility of devices (whoever provided by) and internet connectivity.
- Institutional commitment and support: this includes both learning (academic/mentoring) and technical support.
- Suitability of the learner's physical environment, sufficient time, and at least tacit support from colleagues.
- Positive extrinsic and intrinsic motivations to use mobile learning.
- Responding to individual learning preferences through (universal) learning design, the balance of synchronous and asynchronous activities and the level of interactivity.
- Integration: with the curriculum or programme, the learner experience, 'real life', or any combination of the three.
- Ownership: in order to take ownership of learning it is important that learners can at least treat the device as their own, without restrictions on how they can use it.

Berking & Haag (2015) distinguish two main kinds of mobile learning, one geared to supporting workplace tasks at the point of need and the other as part of an academically-defined learning process. While the two are not mutually exclusive, the literature cited in the previous section indicates that mobile learning is more optimally geared to contextual, just-in-time activity, and its use for programmed learning needs to be particularly carefully designed if it is to do more than be a (poor) substitute for other forms of digital learning. Programmed mobile learning appears to be less successful when it is envisaged as working through a learning package, and more successful when learning tasks are presented as small chunks or snippets that are directly relevant to work tasks or link to longer sequences of learning (Wilke, 2017; Prasad, 2020). Approaches that make use of other affordances of mobile devices are also reported as successful, for instance team-based roleplays using a complex virtual scenario (Beutner *et al*, 2016), using varied applications to support a practical learning sequence (Lai & Yen, 2018), and providing instant guidance and feedback (Hofmann 2018; Jewitt, 2018).

The potential of mobile learning is therefore more fully realised in what can be described as 'here and now' or 'ubiquitous' mobile learning (Martin & Ertzberger, 2013), where the device is used in an immediate way that is situated in a context and a community of learning or practice. This kind of learning is contextual and responds to an immediate need; is embedded in the flow of everyday activities; allows learners to take the initiative in acquiring knowledge and enables them to be self-regulating, controlling the learning process (*ibid*). Martin & Ertzberger add that learning needs to be engaging, authentic and informal, involving learners in both finding and producing information, with mobile devices providing access to scaffolding when and where needed.

Various points are also made relating to support for mobile learning. Tabor (2016) comments that assumptions that young students are always technologically sophisticated (the 'digital natives' argument) needs challenging, and Chen & deNoyelles (2013) found that lower-achieving learners need support to use mobile devices for learning even if they are proficient in using them for other purposes. Lall *et al* (2019) echo this need for guidance on using devices as learning tools, along with attention to ethical matters such as professionalism and distractions from work tasks. Folger *et al* (2021) comment on the need for tutors to be proficient and confident in using the devices themselves. The need for support from employing organisations and other professionals is emphasised by Trede *et al* (2016), Mather & Cummings (2018) and Mather *et al* (2018), who provide examples of mobile learning being inhibited by inappropriate policies and negative attitudes from colleagues and senior staff.

Finally, there is some debate as to whether it is more effective to provide devices or to encourage learners to use their own. Barnes *et al* (2017) reported that nurses were split on whether they would prefer to use their own device with some strongly opposed, while Dimond *et al* (2016), Chase *et al* (2018) and Folger *et al* (2021), all in medicine, found an increasing preference from learners for using their own. The intervention reported by Trede *et al* (2016), in nursing and education, assumed use of (placement) students' own devices.

### ***Conclusions from the literature***

Mobile learning, as a subset of digital learning, can be taken to refer to learning using devices that can be carried on the person, are always on (or can be started rapidly) and in principle are always connected. At present this normally means smartphones and tablet computers, although other devices such as augmented and mixed reality glasses are beginning to offer alternatives for some applications.

Mobile learning covers a range of activities from short programmed sequences and simulations through recording and sharing activities and reflections to accessing information in the moment. The key affordances of mobile devices relate to their portability, connectivity and ease of use, making them particularly suitable for learning that is situated, just-in-time, related directly to work tasks, and that involves rapid communication. This provides a good match with the needs of work-based learning in operational environments, and supports three of the points identified by Lester *et al* (2016) as key aspects of work-integrated learning pedagogy: the learner as an active agent, the workplace as a site of knowledge-generation, and the importance of three-way learning conversations.

Pedagogical questions that are likely to need considering in initiating a mobile learning intervention include the extent to which the relevant mobile applications or packages support learning goals, are motivating to learners, and are easy to use in the learning (including work) environment; the type of activities expected and whether these are likely to exclude any learners; and the support needed by learners at different stages to use the(ir) devices effectively for learning. Practical questions that may need addressing include which type of device (and application) is most effective for the learning objective and the context; when and where learners will be using their devices; internet access at key points of use; and workplace factors that support or inhibit device use, including operational matters, organisational support and the attitudes of supervisors and colleagues.

## The survey findings

The survey was sent to 1689 learners via Qualtrix, an online platform. 196 usable responses were received, a rate of 11.6% (see table 1). The low response rate was not investigated but is not atypical for online surveys of this type (i.e. without prior warning or follow-up), and may not have a significant affect on the results (cf. Foslacht *et al* 2017); at the time the priority was to obtain a rapid response to inform practice. Some respondents did not answer all the questions, and percentage responses have been calculated according to the numbers replying to each question.

Table 1. Survey responses.

Programme	Learners contacted	Usable responses	Response rate	Respondents as % of all respondents
Police Degree Holder Entry Programme (DHEP)	232	31	13.4%	15.8%
Detective DHEP	<u>276</u>	<u>43</u>	15.6%	<u>21.9%</u>
All DHEP	508	74	14.6%	37.8%
Police Constable Degree Apprenticeship	<u>1066</u>	<u>110</u>	9.4%	<u>56.1%</u>
All police	1574	184	11.7%	93.9%
Nursing Associate Apprenticeship	<u>115</u>	<u>12</u>	10.4%	6.1%
Total	1689	196	11.6%	100%

## Device preferences

As outlined in the Introduction, all the learners who were invited to take part in the survey had been provided with an iPad by the universities specifically to support their programme. One police force also provided laptops for their trainees.

The majority (71.4%) of respondents always or mostly used their own or their employer's device in preference to the university-provided one. Less than 30% therefore made significant use ('about equal', 'mostly' or 'always') of the iPad. However, this figure was higher for first-year learners (67% for nurses, 52% on the PCDA and 38% on the DHEP) and less in the second and third years (7% for the PCDA and 15% for the DHEP). While this points to an apparent decline in use it is comparing different cohorts rather than the same cohort over time; changes made between years – such as improving integration between academic and work-based learning and assessment, as well as providing better inductions to the devices for the nurses and their supervisors – may therefore influence the results.

All but six learners (3.1%) made at least some use of a device supplied by themselves or their employer. There was a strong preference for laptops (or other PCs/Macs) (86%) rather than phones (22%) or tablets (8%). Some learners had access to more than one personal or employer-provided device; of those using a (non-university) tablet all but one also used another device. This pattern was similar across programmes and cohorts, with a small increase in laptop use in years 2 and 3 (e.g. from 75% in year 1 of the PCDA to 100% in year 3).

Respondents were asked what features they preferred about the device that they mainly used, and what if anything they disliked about the iPad. The most common reasons for preferring devices other than the iPad were a larger keyboard (63%); larger or clearer screen (58%); familiarity with the type

of device (44%); and preferring the operating system (41%). The main dislikes about the university-supplied iPad were preferring to use a laptop or desktop computer (64%); limited scope for customisation (32%); the size of the keypad (32%); the size of the screen (24%); and difficulty adapting the device to their needs (24%). Some learners added free text comments about why they preferred laptops. Half of these commented that the physical keyboard was better for assignments and similar work, while the other main themes were having a wider range of applications and being able to use multiple windows at a time, and avoiding to have to carry around a second device for university work (police officers need to use a computer to access work applications).

These points were mirrored in comments on dislikes about the iPad, with five main themes emerging. The issue of limited functionality for producing written work and multitasking, including physical features (the smaller screen and keyboard), problems with using multiple applications simultaneously, and difficulty in using Microsoft applications, was mentioned by eight respondents (19% of 42 commenting). Nine (21%) saw the iPad as being too restricted, for instance lacking or preventing access to some applications and features. Other comments concerned device duplication (5, 12%), technical issues (4, 10%), and the choice of operating system (3, 7%). On the other hand a minority of those responding (6, 15%) were positive about the iPad, either because of not having an alternative device or because it could be used differently, for instance as a 'massive notebook' using an Apple Pencil. Others (5, 12%) saw benefits in both devices, for instance using the iPad as a tool for looking things up quickly or completing initial training workbooks, and the laptop for police applications and writing assignments.

### ***Improvements that the university could make***

The survey asked what improvements the university could make in relation to the technology. 85 learners responded, a few with multiple suggestions but most with a single theme. Ten of these (12%) were happy with the current provision or thought it was fine for those who didn't have their own equipment. The largest single group of comments (40%) suggested providing a laptop rather than a tablet. Most comments about laptops indicated that they would be more useful without having any significant drawbacks.

A similar number of respondents (41%) suggested making improvements to the iPads. These divided into two main suggestions. One (25%) was to improve the software functionality, generally by removing restrictions on the applications that could be run. The second was to add a physical keyboard (15%) or in one suggestion a stylus to make inputting to the device easier. This reflects comments by those who favoured laptops that it is nearly impossible to use the iPad to create long text documents. A third suggestion (2%) was to improve connectivity for instance by including a 4G SIM card.

### ***Where devices are used***

Learners were asked where they used their device(s), whether their own or the university-supplied one. Almost all used it at home, and just under half (48.5%) at work, though less than half of these (23% of the total) used it on duty as opposed to in breaks or study time. Other locations of use (38%) included on training courses and to a lesser extent in the university and in libraries or cafés.



Learners were also asked how supportive their colleagues and supervisors were of using their devices in work time. For some, colleagues were either ‘actively’ (15%) or ‘on balance’ (24%) supportive, while only 10% were discouraged from using their devices. However, for nearly half the learners (49%) colleagues and supervisors were neither supportive nor discouraging, a disappointing proportion given that provision of mobile devices was part of the consortium contract.

***What devices are used for***

Learners were asked what they used their devices (own or university or employer-provided) for. The largest use was for training and study purposes, comprising looking up information (85%), working on university or training materials (81%) and communicating with trainers and tutors (63%). Over half (57%) also used the device(s) for looking up work information as needed; the only substantive difference between groups that was observed was an apparent drop-off in this type of use across the three years of the PCDA (from 59.4% in the first year to 43.5% in the third year). Less widespread uses included communicating with supervisors (29%), communicating with other learners (23%) and taking part in apprenticeship reviews (26%).

Learners were also asked to score the usefulness of the device(s) that they used for five purposes, on a five-point scale from 1 (not at all) to 5 (very helpful). The relevant devices were rated highly for learning at a time and place that suits the learner and for finding things out quickly and efficiently, and to an extent for gaining information and support for operational purposes, but less so for sharing and communication (Table 2).

*Table 2. Usefulness of devices for different purposes.*

Purpose	Mean score	% scoring 4 or 5
Learning at a time and place that suits you	4.3	81%
Finding things out quickly and efficiently	4.2	77%
Finding information and support for operational purposes	3.7	61%
Sharing with other trainees	3.6	58%
Sharing with people outside the workplace	3.5	53%

The third question in this series asked what methods – mobile device, computer (PC or Mac), paper-based and face-to-face – learners used for various learning-related tasks. Computers consistently scored most highly for researching, writing and task-related activities, with mobile devices proving considerably less than half as popular apart from for carrying out short training tasks (PC/Mac 76%, mobile 39%). Mobile devices were particularly unpopular for writing assignments (16%, versus 94% for computers). For communication and information-sharing a mix of computers, mobile devices and face-to-face was used, though computers again dominated other than for peer communication when mobile devices were slightly favoured (58% to 46%).

***Other improvements to aid learning at work***

As a final question, learners were asked if they had any suggestions for how the university could improve support for their learning at work *other than* through how it provides or supports technology. Some responses reiterated technology-related points made earlier or couldn’t think of anything, but a common theme was better integration and communication between the university and the

workplace. This referred to practical aspects such as recognising and fitting in with operational workloads and professional assessments; integrating learning materials on to a single platform; and better linkage between academic and workplace learning, for instance through more academic discussion and chat rooms linked to work matters.

## **Discussion**

The learners in the survey appear to be positively oriented towards the use of digital devices, though principally for more traditional kinds of education and training activity – researching information for assignments and training tasks, completing assignments and training activities or packages, and communicating by email and videoconferencing. These are areas where laptops are likely to be more effective than smaller devices. The introduction of a mobile device in this context creates substitution (Puentedura, 2014) but in a way that may be functionally less effective. Returning to the five key affordances of mobile devices set out in the literature review (convenience, expediency and efficiency, immediacy, connectivity and collaboration, and fun) the way that devices are used on the programmes only really appears to exploit these for looking up information relevant to work, and there is limited evidence as yet of augmentation, modification or redefinition of learning activities (*ibid*). The point made by Glover and Roger (2018) about mobile learning creating a culture of autonomous, learner-managed, interactive and collaborative learning is yet to be fully realised, and use of devices for learning ‘at the work face’ where they arguably have greatest value (Berking and Haag, 2015) is reported by less than two-thirds of learners. The provision of mobile devices for learning therefore does not appear to have translated into widespread mobile learning.

These comments need to be set in context in policing where training has traditionally been prescriptive, abstracted from practice and lacking space for reflection; both recruits and their supervisors can see the ‘lessons of the street’ as more important than formal training (Wood, 2018). The aim through the PEQF to create a more reflexive and integrated learning culture may therefore be realised only gradually. Some of the comments expressed by survey participants reflect this, particularly in seeing university work as disconnected from practical policing and in attitudes to using devices at work. Assumptions that might be made in the health sector, where mobile learning has been most studied, cannot therefore always be assumed to transfer directly into policing, though they can offer pointers for aiding cultural change.

The literature indicates that while some mobile learning takes place without prompting, it needs to be instigated with a particular purpose in mind and set up to take advantages of the affordances provided by mobile devices. The most successful applications make use of mobile-specific advantages. These are typically short, flexible interventions or resources available at the point of need (e.g. Martin & Ertzberger, 2013). Most of the use-cases in the literature identify specific applications of mobile learning that either provide direct support for workplace activities, or are well-integrated into the overall pedagogic approach, or both. This suggests that specific mobile learning activities or resources need to be designed as part of an integrated programme with active support from workplace supervisors and mentors.

In principle there may be a case for asking learners to use their own devices (cf. Chase *et al*, 2018 and Folger *et al*, 2021), although there is potentially an issue of excluding learners from low-income or digitally-poor backgrounds if it is assumed that having a mobile device is a necessary requirement for

participation (see for instance Barber *et al*, 2021). The case for supplying a specific device, rather than for instance offering equipment on loan, might be stronger if it is linked to specific activities and resources that are valued by learners and their supervisors.

A final comment concerns the tendency for tablets to be squeezed out between the handiness and portability of phones and the superiority of laptops for text-heavy applications and multitasking. A laptop (or desktop) computer is an almost essential piece of equipment for many higher education learners, while an assumption can also be made that many own or have access to a phone. Data from Statista<sup>2</sup> shows that smartphone penetration was almost at saturation in the UK (90% of the population having access) by 2020, while tablet computers peaked at 59% in 2016 and had fallen to 52% by 2020. Laptops were steady at 64-66% between 2013 and 2017, fell to 57% by 2020, then rose to 76% in 2021 in response to needing to work and study remotely.

## Conclusions

Returning to the question posed in the title of the paper, 'can mobile learning work when work-based learners prefer laptops', despite the issues revealed in the survey the answer still appears to be positive. However, it needs to be qualified in two ways.

The first is that mobile learning is designed purposefully as a part of the overall programme pedagogy in a way that plays to strengths of mobile devices and fits into the natural flow of work. It is unlikely to be successful if it simply attempts to substitute for things that can be done better, or as well, on laptops. Mobile devices are well-suited to in-the-moment learning, instant communication and evidence capture from the workplace, and capitalising on these advantages means building relevant activities into the programme and its assessment strategy. This could include for instance having relevant work-related resources (such as police legal guidance, clinical information and contextual information such as individual patient notes) available on demand (cf. Dimond *et al*, 2016 and Del Rosario-Raymundo, 2017); using a critical incident log, that might include audio and video as well as textual notes, for reflection, discussion and assessment (cf. Virnes *et al* 2017); and requiring reflection on how information has been accessed and used to make decisions in the normal flow of work.

The second is that mobile learning is integrated into the professional and organisational working environment, so that the use of devices at appropriate points is accepted and actively supported as part of learning on the job. The literature indicates that policing is not alone in having (had) a culture that is not supportive of mobile learning or views using devices in operational environments as unprofessional. On the other hand it also illustrates how mobile learning can become accepted in busy environments such as hospitals, factories and construction sites particularly when it is introduced as an aid to work rather than as a separate 'training' activity. This points to bringing in learners' supervisors and mentors, as well as more senior managers, to establish acceptance and day-to-day support for mobile learning activities in the workplace.

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<sup>2</sup> <https://www.statista.com/topics/7188/mobile-devices-in-the-uk/>

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