

# white paper

**7 things everyone  
should know about...  
mobile learning**

An Epic White Paper by Dr Naomi Norman

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Based on the experience of Epic's mobile division and interviews with colleagues:  
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# 7 things everyone should know about... mobile learning

1. The business case for mobile learning
2. How to build a mobile learning strategy
3. What to do about all the different mobile devices
4. Whether to build your own mobile learning or commission bespoke
5. What's unique about mobile learning design?
6. How to make mobile assessment work
7. How to publish your mobile learning

Appendix: Some mobile learning examples

# No.1: The business case for mobile learning

## The growth in mobile device ownership among your staff

Chances are that while reading this, you have a smartphone somewhere close to you – perhaps on your desk, in your pocket or in a bag. And if you don't own one, then someone nearby probably does! In fact, according to OfCom's latest Communications Market Report, almost a third of UK adults now own a smartphone, and, of that third, the majority carry them on their person, switched on, at all times. Tablets are growing in popularity too: KPMG reports that ownership among UK adults more than doubled from 2% to 5% in the first six months of 2011. If this current rate of take up continues, we could all be using mobile devices by the end of 2013.

## How we're using mobile devices

A recent Google survey of more than 5,000 smartphone users demonstrates just how mobile devices are becoming embedded in our lives, and acting as an extension to our PCs. They enable us to continue to browse the internet, search, use apps and watch videos (all potential learning activities) while on the move.



And what exactly are we doing when away from our desks and using our mobile devices? Well, of those who participated in Google's survey, among the top three responses were:



## The pace of change in your organisation

This is all happening at a time of increased pace of change in organisations. Gone are the work practices that remain the same for long periods, and going are the formal learning activities to support them, involving hours, if not days, away from the workplace. Change is now happening over months not years, and, according to management guru Professor Gary Hamel of London Business School, businesses must seek to be nimble, quickly learning and innovating to ensure they are competitive. This means staff connectivity to current and relevant information is becoming all the more important.

The time is right for weaving technologies that support quick, informal, anytime/anywhere learning into the learning landscape... Cell phones are ubiquitous and are the 'go to' device for staying connected. There is no doubt that we are becoming a much more mobile society.

Judy Brown & David Metcalf

## The Return on Investment that you could achieve

The proliferation of mobile devices, many of which are already owned by your staff, means little investment is required in the actual hardware for mobile learning. On top of that, our willingness to use our mobile devices while engaging in what may be defined as 'wasted time', or at least 'non-working time' (waiting for meetings to begin, eating lunch, or commuting by train) means there is now little opportunity lost in terms of the work that could have been done while engaged in training. The constant access to necessary information via our mobile devices has the potential to increase our productivity and

boost revenues too. Now also add the typical savings for any learning technologies solution over classroom interventions, such as cutting repeated trainer fees, facilities hire, travel expenses and administration. Even after taking into account of design and development costs, the case for mobile learning becomes rather compelling.

Learners' attitudes and expectations of mobile learning will increasingly be driven not by those inside their organisation but by those of the wider social world, from the family, the community, the peer group and the sub-cultures. For any organisation this issue will become increasingly important.

Professor John Traxler, UK's only professor of mobile learning

## If your competitors aren't doing it yet... they will very soon!

It is no surprise then that mobile learning is on the up in all kinds of businesses, across all sectors. A recently published benchmark study involving 600 organisations, by UK-based research company Towards Maturity, points to 'mobile learning becoming established as mainstream'. Among its findings: 39% of organisations are already making use of mobile learning and many more are set to follow in 2012. Meanwhile, American analysts Ambient Insight reports a growth rate of 29.3% among US corporations buying mobile learning, with many of the large ones, like IBM, Kraft, Pepsi, and Accenture, now having their own internal mobile app stores.

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## No.2: How to build a mobile learning strategy

### Remind yourself of your organisation's goals

As with all strategies, it is important to be clear about the goals your organisation is working towards. These may be to decrease time-to-market of products or services, to increase customer satisfaction, seek to lower costs, or encourage greater innovation. Whatever they are, only once you know your organisational goals can you determine the performance you are targeting. And only then can you make a start on your mobile learning strategy.

### Identify any relevant and existing strategies

It is much better to integrate your mobile learning strategy within your overall learning and development strategy, than for it to stand alone. This will ensure that you acknowledge both the unique contribution of mobile learning, as well as how it complements other kinds of learning opportunities. For example, while there may be a good case for face-to-face training to ensure practical skills, or e-learning to offer foundational knowledge, their success may be heightened by mobile for ongoing easy referencing and performance support too. The Department of Health recently successfully integrated mobile learning into its new learning strategy document:

This framework focuses on three particular types of technology: e-learning, simulation and newer (in particular mobile) technologies. However, technological applications should not be seen as a substitute for other methods of learning but as a means of providing enhanced learning as part of a managed and integrated learning process for the benefit of patient care.

Department of Health, Framework for Technology Enhanced Learning

### Gather missing information

Once you are sure of your organisation's goals and you have familiarised yourself with any relevant existing strategies, it is time to begin to gather useful information. In particular, you need to explore current and future training requirements. Of course, a needs analysis may already exist, but, if not, then it may be necessary to examine performance review documents, and perhaps interview managers, or survey staff. And, with mobile learning in mind, it would also be a good idea to determine where and when staff would prefer to undertake their training and learning, and for how long. Also, you will want to know if staff already own a smartphone or a tablet, be it a personal device or one on loan from the business, and, if so, the makes and the models.

## Develop your strategy

The next step is to ask where mobile learning would be most effective in addressing the needs you've identified from the activity above. Could it be to contextualise induction training, so that it can happen in the exact spot in the workplace it refers to? Could it be to enable machine training to happen at the actual machine? Could it be to offer support with decision-making, wherever that decision may need to be taken, even when away from the desk or the office? Could it be to remind staff of an important procedure at the exact moment they are carrying it out?

Having identified where mobile learning has the most to contribute, you'll need to think about the design. Will you require the richness that can be achieved with native apps (built for the specific operating systems of different devices), or will a basic web app (built in HTML5) suffice? Do you want to commission your mobile learning from someone else, or would you rather build capacity, buy a licence for a mobile authoring tool, and do it yourselves? Do you understand the principles of mobile learning design and is it necessary for you to track the learning and/or include assessment?

For these aspects of your strategy you may find it helpful to consult the following in this series of '7 things everyone should know about mobile learning':

No. 3: What to do about all the different mobile devices?

No. 4: Whether to build your own mobile learning or commission bespoke?

No. 5: What's unique about mobile learning design?

No. 6: How to make mobile assessment work

You'll also need to make decisions about how to distribute the mobile learning to your staff's devices, once it is built. You may choose to use public marketplaces, such as Apple's App Store, or Android Market, but you may also go for an alternative method, such as an app store that is private to your organisation, or a Mobile Application Management system.

For this aspect of your strategy you may find it helpful to consult the following in this series of '7 things everyone should know about mobile learning':

No. 7: How to publish your mobile learning

Then there's the cost of building the mobile learning too, set against the return you can potentially achieve from its many benefits. One way to determine this return is through the use of analytics. Bake them into the backend of your mobile learning and you will know for sure how regularly it is being accessed, for how long, and in what ways. This is the sort of data which will enable you to confidently calculate the return on investment that mobile learning is bringing your organisation.

## Create an implementation plan

Finally, there is no point in having a strategy without a plan to ensure successful implementation. This should include some activity right up front. For example, involve senior managers early on to get buy-in to the concept of mobile learning. Also, recruit some staff from across your organisation (and not just the enthusiastic ones!) to form a focus group and comment on initial ideas and designs. These staff will not only offer useful insights but many will go on to become champions, spreading the 'mobile learning' message for you. Therefore, make the most of them: back them up with a communications campaign that doesn't just announce mobile learning at its launch, but prior to that tells the rest of your organisation it is on its way. Remember:

We're not just introducing new technology for learning – we are introducing a new way to think about learning.

Marc Rosenberg

Provide a forum for asking questions too, and perhaps do a small pilot to ensure everyone will have a smooth experience on roll-out to the entire organisation. And don't forget to update your acceptable use and network security policies to include mobile devices too, as your staff's smartphones and tablets will be accessing your organisation's network, just like any other computing device.

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## No.3: What to do about all the different mobile devices

### What mobile devices are we talking about?

Mobile devices are usually defined in two ways: as 'portable', which embraces the laptop and netbook computer, or as 'handheld', which tends to eliminate these devices. For the purposes of clarity, this paper uses the 'handheld' definition, with a particular focus on smartphones and tablets. That's because these are the most popular devices and they are on the rise.

### Just how many different devices are there?

The plethora of mobile device models, made by companies such as Apple, Samsung, HTC, RIM, Nokia, Microsoft, and alike, is of less concern than the different mobile platforms. That's because it is the platform that your mobile learning apps sit on which determines the code they are written in.

**More than 3.6m people  
in the UK now own a tablet**

Financial Times, 11 September 2011

**42%**

**growth in smartphone sales**

BBC News, 15 November 2011

### What are the most popular platforms?

Three of the most popular platforms are Apple's iOS, Google's Android and RIM's BlackBerry OS. Therefore, if some of your staff have an Apple iPhone or iPad, then they will need their mobile learning to run on Apple iOS. If others have a Samsung tablet or certain HTC smartphones, then they will need their mobile learning to run on Google's Android, and, if still others have BlackBerries, then there is a third platform to consider. (Also

note that Nokia's Symbian used to be a popular platform, but in 2011 they announced that they are going to use Microsoft's Windows Phone platform, which promises to be a fast-growing competitor in the future too). There are also apps built for the web in HTML5, which work across most mobile devices, whether Apple, Android or BlackBerry. This may sound like the answer to the many different device types in your organisation, and so the 'King' of all platforms. However, it is not that simple! Read on...

## Native versus web apps – what’s the difference?

You will no doubt hear people referring to native and web apps. A native app is one that is designed for a specific platform. For instance, a native app written in the programming language Objective C for the iPhone or iPad will only run on the proprietary Apple iOS platform. A web app, on the other hand, is one built in HTML5 and will run through any device’s modern web browser, irrespective of whether it is Apple, Android, BlackBerry... Just to complicate things a little, there are some hybrid versions too! For example, native apps that make use of real-time web connections (such as to send data back to a learning management system as soon as there is connectivity), or web apps that provide offline modes (such as some news apps, which allow you to read news stories offline and then grab the latest updates when a connection is next made).

## Native versus web apps – which is better?

So which is better – the native app or the web app? In short, if you are looking for a basic text and graphic app with little interaction, then a web app may suffice. If you want any kind of sophisticated learning experience though, then the native app is definitely the way to go. This is why...

Unlike web apps, which are viewed through the mobile browser, native apps sit in the memory of the mobile device. This means that they can cache information persistently and so provide faster access. It also means that, unlike web apps, native apps can easily support rich media, such as audio, video and animation. There is a commonly held belief that even when creating native apps, flash animation will not be supported on all mobile devices. This can be easily overcome though, simply by converting any flash animation into an MP4 video file.

Native apps can also easily make use of native device features, such as the calendar, camera, accelerometer and GPS, which is not always possible for web apps. These features can really enhance a learning experience. For instance, you may wish to use the GPS to push a notification or reminder when a learner is within a certain distance of a particular location. Alternatively, you may wish learners to make use of the camera to record evidence for assessment.

Native apps offer a more slick experience too, with ‘idiosyncratic transitions’, such as the ability to flick a list and see it slow, then flick it harder and see it bounce. Web apps can achieve some of these transitions as well, but they do not perform as effectively. Of course, such features may seem irrelevant to learning, but they give an impression of a high quality app, which is fast becoming an expectation of mobile users.

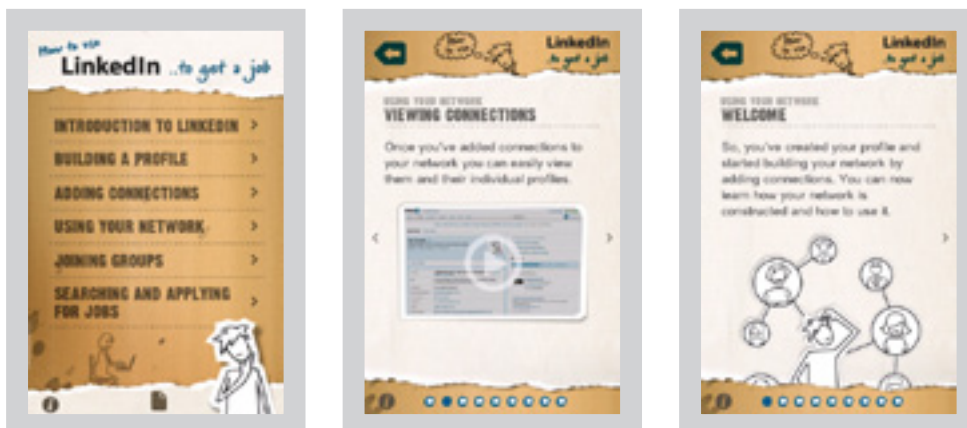
Overall then, learners get a faster and better visual experience with native apps, which may just lead to heightened engagement. And, with a native app there is no chance of errant clicking taking a learner out of the mobile learning to an unrelated website with no clear way back!

One drawback of the native app over the web app is it may have to go through an app store to be published. However, as long as your developer knows the rules of the app stores, this shouldn't cause any more than a short delay in launch (by anything up to two weeks). Besides, public app stores may not be the best way to distribute your native apps anyway.

For further information about publishing your mobile apps, see the following in this series of '7 things everyone should know about mobile learning':

No. 7: How to publish your mobile learning

Undoubtedly, over time, HTML5 is likely to improve and may make some of the features currently possible only for native apps available for web apps as well. However, for now, it is still not a standard, which can pose a security risk, and also means it can behave differently in different mobile browsers. HTML5 will always be playing catch up, and, as it does so, the mobile platforms from Apple, Android, BlackBerry and alike, continue to move on, enabling native apps to become ever-more sophisticated. Also, we shouldn't forget that HTML4 took almost ten years to be fully supported, and the fast-pace growth and demand for mobile learning will wait for no-one!



## The big question: how do you deliver high quality, across platforms and cost-effectively?

Having read this far, it may seem like you are caught between a rock and a hard place! You can either choose a web app built in HTML5 that delivers quantity across platforms, but forfeits some of the quality, or you can choose a native app and deliver high quality, but in a reduced quantity to a single platform. The third choice, of course, is to commission several native apps to cover the most popular platforms, delivering quality and quantity, but potentially increasing the cost too.

Don't despair though, as there is an alternative. Those working at the forefront of mobile learning now have the capability to design and develop once, and deliver mobile learning in a variety of formats: as native apps across the different platforms AND as HTML5 for a web app AND even for viewing as e-learning on a PC too. This offers the best of all possible worlds, achieving quantity and quality, while also maintaining cost effectiveness at the same time. (Epic's GoMo Learning authoring tool does exactly this!)



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GoMo Learning – [www.gomolearning.com](http://www.gomolearning.com)

## No.4: Whether to build your own mobile learning or commission bespoke

### What you need to consider if building your own

There are a number of advantages to building your own mobile learning, not least the ease and speed with which you can deploy critical information across your organisation, and at a relatively low cost. Therefore, it is no surprise that there are also a growing number of mobile authoring tools out there that can help you to do this.

As with the selection of any authoring tool, the best way to begin is to create your list of 'must haves' and 'desirables'. Compiling your list may involve asking a few practical questions such as does the authoring tool support multiple users, and is it available in the cloud, enabling content to be created remotely over the internet? You should also consider usability and support – is the interface intuitive and can your users get training and access to a helpdesk? And what about creative freedom – is it possible to achieve a customised look and feel, rather than being restricted to a particular template? Then, of course, there are important questions that relate to the learning experience too – is there a wide range of ways to organise your content, allowing the upload of any existing graphics, video and audio files you may have, offering hotspots and slide-out screens for further information and feedback, and different question types? And, once done, does the authoring tool enable you to publish to all the different platforms as a native or a web app and to review your work on the actual mobile devices it will be used on?

For further information about native and web apps, see the following in this series of '7 things everyone should know about mobile learning':

No. 3: What to do about all the different mobile devices

The answer to all the questions above is 'yes' for Epic's mobile authoring tool, GoMo Learning, but it may not be for all mobile authoring tools.

### Why consider commissioning bespoke

Building your own is not without its problems though, especially if this is your first foray into mobile learning. Even those who are experienced e-learning designers can 'trip up' when initially writing and designing content for mobile. Therefore, buying in expertise can ensure you produce high quality mobile learning from the off. This need not be expensive nor time consuming either. Depending on the required length of the learning experience, the desired level of interaction, and whether there is already existing content in raw form, the cost for commissioning bespoke can run into thousands rather than tens of thousands, and the time can run into weeks rather than months.

## Why not do a bit of both?

Of course, you don't necessarily have to make a binary decision between building your own or commissioning bespoke. Imagine you have a team of learning and development professionals who have some e-learning build experience, and you would like them to use a mobile authoring tool to create mobile learning. Having chosen and bought your tool, you could commission a mobile skin, or a series of skins, that provides a visual identity in keeping with your organisation's brand. You may also commission graphical and other assets that complement those that you already have in your existing learning materials. And finally, you could seek an instructional designer with extensive mobile learning design experience to run a series of workshops for your team and review what they create in the initial stages. This approach has all the benefits of building your own, while increasing your in-house capacity to ensure you achieve fast and cost-effective mobile learning that also has high instructional value in the future.

## No.5: What's unique about mobile learning design?

### Designing for the smaller screen size

There are some design principles that are the same for mobile learning as for e-learning, yet they become exaggerated because of the smaller screen size. Take the organisation of content. Chunks may potentially need to be even shorter and more digestible. This is especially true if offering quick reminders on the move, or 'dip in / dip out' learning for exactly the moment it's required. Text needs to be even more economically used than for e-learning too: not just cut, but ruthlessly cut! (This is made somewhat easier by less demand for instructional text in mobile learning. You don't need to tell learners to 'click here to...' as user research shows they are surprisingly willing to 'experimentally' tap and swipe to explore for themselves.) Extra care needs to be taken with images as well. They can still support text in mobile learning, but be sure any important detail isn't too small to be seen. If it is, then there are two options: the first is to design it so the learner can scan around the image or zoom; the second is to create an animation which builds to show the different parts of the image in turn.

### Audio in mobile learning

Audio can be very successfully employed in mobile learning, though you need to bear in mind the environments in which the learner will be using it. It may be fine if likely to be accessed in quiet places, or, indeed, if you know your learners will have headphones. Audio may not work so well though if the mobile learning is for performance support in a noisy factory. (The same may be true of video clips that include audio with them.)

### Video in mobile learning

Mobile learning really lends itself to short bite-sized video clips. In most circumstances you will want them to be just that though – short and bite-sized! Learners rarely appreciate long videos in e-learning, and are likely to be even less tolerant of length if watching on a smaller screen. Nonetheless, even short video clips can be a great way to support an important point or demonstrate an action. The further good news is that, unlike PCs, mobile can more easily deliver video (and audio) for learning, as there are less bandwidth and corporate network restrictions. However, do bear in mind that file size can be a problem, especially if using a web app.

For further information on web apps and also reference to Flash videos, see this series of '7 things everyone should know about mobile learning':

No. 3: What can you do about all the different mobile devices?

## Which way up?

As a mobile screen can be held in portrait or landscape, you'll need to decide which way up you want your mobile learning to be. Typically, if you are designing for a smartphone, then it will likely start in portrait in the learner's hand – that's the most comfortable way to hold it, and it's also the orientation for most smartphone home screens. The same is not true for tablets though, which are mostly held and viewed in landscape. Surely, the choice is easy then – portrait for smartphones and landscape for tablets. However, there are some exceptions to this rule, dictated by the content. For example, if your mobile learning is fairly text-heavy, then landscape is better: the longer lines of text make for easier reading as the eye doesn't have to so frequently jump to the next line. Some graphics also may be wider than they are high, more logically lending themselves to display in landscape. Therefore, it is best to design predominantly for one orientation and offer it in the other orientation when it makes most sense to do so, say portrait for short extracts of text accompanied by graphics, with videos shown in landscape because they are most naturally viewed this way.

## Fingers and thumbs

Desktop software typically places menus, toolbars and buttons at the top of the screen. Think of Word, for example. The same is true for the primary navigation on most websites. Designing for mobile is different though, as it is all about fingers and thumbs. For example, in the case of smartphones, the thumb needs to comfortably tap the screen while the device remains safely held in one hand. This makes the bottom of the screen the best target area for any key buttons and navigation. Other targets for interacting should be positioned in the bottom two-thirds of the screen. Meanwhile, anything that should only be tapped on purpose, such as a delete button, is best placed in a top corner, where a deliberate stretch is required to reach it.

The size of buttons is important too. A stylus or a mouse pointer can accurately hit a target that is only a few pixels wide, but this is not the case for a thumb, or even a finger, which is less precise. Therefore, buttons should either be the right size for a finger (about 44 pixels, or 7mm square as a minimum), or, if a bit smaller, then the area around them should respond to a tap too. Of course, this means buttons should not be placed too close together either to avoid any accidental tapping on one button when aiming for another.

## To scroll or not to scroll

Just as with e-learning or a website, where possible, all content should fit on a single screen view without scrolling. This ensures nothing is missed, and the learner's focus is not interrupted to seek out the rest of the information. If a single screen view makes a screen too crowded, and so is not possible, then a tap could reveal a slide out screen to show extra information, or a swipe could 'turn the page' to reveal more. Alternatively, content can be layered in multiple screens, with the top layer screen showing the 'must know' information and then each tap revealing further detail. Sometimes, of course, scrolling may be unavoidable, especially if designing for smartphones rather than tablets. That's fine, as long as there is some obvious icon or other indication that the learner needs to scroll. Also, in these cases, the primary navigation buttons should remain anchored in the same place. (Don't make the mistake that early versions of the Facebook app made when they didn't do this, and users had to scroll back up through a friends' potentially long profile before they could move on!)

## Navigation

There are several navigational styles typically employed for mobile apps. One of the most popular is the 'tree structure', which enables the learner to access a main menu, then a sub menu then a sub sub menu and so on. This is an efficient and familiar way of organising a lot of information and is common to e-learning too.



Another popular one is the 'card system', where the learner swipes horizontally to glance through a deck of cards. This is great for browsing.

Some apps combine a number of different navigational approaches. Take the Collins GCSE maths revision app shown in the pictures above. This begins with a tree structure to enable the learner to quickly and efficiently drill down, and then employs the card system to allow the learner to browse for their chosen topic.

There are conventions that have grown up around navigation on mobile devices. Sticking with them makes less work for the learner, as they will be familiar. For example, the screen title in the navigation bar at the top of the screen or at the top of a card that reminds the learner what they are looking at, and the row of dots at the bottom of the screen that represents the number of pages, with a highlighted dot showing the page currently in view.

## Gestures

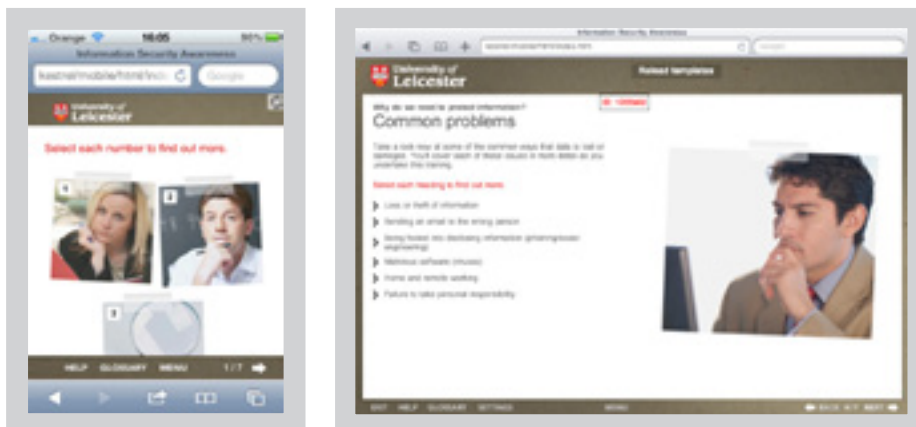
The other main conventions in mobile app design relate to gestures, some of which have already been mentioned above: the tap of a button, the drag to move, the flick of a list, the swipe from one page to the next, and the pinch or double-tap to zoom. These are the most popular. Alter them (or add any novel fancy ones) at your peril! None of your learners want to have to get to know new gestures, nor do you want them to be focused on this rather than the content of your mobile learning. Having said that, there are ways to embellish gestures, which adds to the experience of using mobile devices, and which research shows give a 'wow factor' and enhance engagement. Such embellishments tend to seek to replicate the physical world. For example, flicking to scroll through a list and seeing it slow like it is responding to friction, or over-scrolling and seeing it bounce back like it is elastic. (Note: many of these embellishments are only available in native apps and not web apps which are viewed through a mobile browser.)

For further information on native apps and web apps, see this series of '7 things everyone should know about mobile learning':

No. 3: What can you do about all the different mobile devices?

## A final word of advice

All this is not to say that taking account of smaller screens, fingers and thumbs, gestures and such like, creates learning that can be exclusively viewed on a smartphone, or exclusively viewed on a tablet. With some subtle design considerations upfront and a little bit of clever programming, screens can be rendered not just for different mobile devices but for a PC screen too. Look at this learning designed by Epic for a consortium of universities to be viewed on mobile or PC:



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Clark, J., 2010. Tapworthy. Sebastapol, Canada: O'Reilly.

## No.6: How to make your mobile assessment work

### Types of mobile assessment

Mobile assessment (like any other assessment) can be designed to check comprehension and so direct learning, or perhaps to test knowledge at the end of a learning intervention. There is one further type of assessment that is particularly well-suited to mobile devices, though, and that is assessment via evidence gathering. At last, there is a real opportunity for learners to record their activities, accomplishments and achievements at the moment they occur, using the camera that is built into so many mobile devices. And the experience of doing this can be seamlessly integrated into the mobile learning (assuming, of course, your learning is delivered as a native app, which is able to access and make use of features on the hardware of the device, such as the camera).

For further information on native apps and web apps, see this series of '7 things everyone should know about mobile learning':

No. 3: What can you do about all the different mobile devices?

### Content

Many of the same techniques may be employed for mobile assessment as other assessments too, although the smaller screen calls for some additional consideration. For example, multiple choice questions must have answers written as succinctly as possible, and be accompanied by buttons spaced appropriately for a finger tap. Meanwhile, for an assessment that requires matching correct pairs of items, there is not much space to allow accurate finger taps, nor drag and drop, especially when there are several options to choose from. A possible solution is to label each option with a number or a letter, and then ask the learner to enter their selection using their on-screen keyboard. The same applies to re-ordering: there may not be enough screen real estate to drag and drop items, but you could place a box beside each item with an instruction to enter a number or letter to indicate where it appears in a list. This is not to say that entering using a keyboard is necessarily preferable to tapping or dragging with the finger, just that there are circumstances where it may offer a useful alternative.

The smaller screen of mobile devices may call for feedback to be designed in a slightly different way as well. For example, rather than appearing underneath a question once it has been answered, and so requiring a scroll, the feedback may appear as text in a slide out screen, or even in a very short video clip of an expert or an examiner giving their opinion.

For further information on designing for a mobile screen, see this series of '7 things everyone should know about mobile learning':

No. 5: What's unique about mobile learning design?

## Tracking

In very many cases, it will be important to collect the results of assessments. This calls for your mobile app to report, most likely to your Learning Management System (LMS), and if not to an LMS, some kind of website or database. This requires connectivity, but we all know our mobile devices go in and out of a wireless and 3G signal, losing and then gaining their connection from time to time. So, the last thing you want is for a learner to be three-quarters of the way through an assessment and a loss in their connection means they lose all their answers. There is a way around this: design your mobile learning as a native app (rather than a web app). All the learning can be done without a connection. Then when it comes to doing the assessment, a connection is required, but for only a very short time at the start, when your learner is asked to log in and identify themselves. If connectivity is lost after that, the learner will still be able to take the assessment, safe in the knowledge that all their answers are being stored in the memory of their mobile device. Then, the next time they are connected, all their answers will automatically report back to the LMS, or wherever they are being collated. This has a further advantage of only a small amount of data (only the assessment answers) having to transfer over the connection, making it more efficient.

## Cheating!

No-one likes to think that learners will try to cheat. The temptation is arguably even greater with mobile learning than with e-learning though, because of the portability of the devices: log in, pass your smartphone or tablet to someone else who knows their stuff, and let them take it away and do the assessment for you! The built-in camera on many mobile devices can help prevent against this kind of cheating, since it is possible to program a mobile assessment so that as a learner is answering questions, the camera takes photographs of them at random intervals. These photographs then can be matched against the one stored for staff on an HR system. This means the learner can do their assessment whenever and wherever they want to, truly taking advantage of mobile learning, while whoever is in charge of the assessment can be confident it was really them who answered the questions. One word of warning though: of course, you would require the learner to be made aware that their identity was being validated in this way, and if they objected then you would have to offer an alternative means of them undertaking the assessment with some invigilation.

## No.7: How to publish your mobile learning

### Delivery

If you create web apps, then getting your mobile learning on to mobile devices is as simple as publishing a website. If you create native apps, then it may require publishing to app stores, be it Apple's App Store, Android marketplace or others. The problem with this is the web and public app stores publish apps to the widest possible audience. Meanwhile, your app may only be relevant to a particular audience, perhaps a specific section of your workforce, or it may contain content that needs to remain within the confines of your organisation. One solution is to create your app so that when it launches it asks for a password which is only made available to your staff. This has the drawback of being reliant on no-one sharing the password with others. An alternative may be 'sideloading'. This method of publishing apps is closest to the traditional PC model: you send your users a media file, which they transfer from their computer to their mobile device by syncing. However, this has the drawback of relying on learners doing the transfer from one device to another and some may not be successful in performing this technical task. Therefore, instead, you may decide to have a private app store. As the name suggests, this behaves similarly to the familiar public app stores, yet the store is only accessible within your organisation. A final option is to use a Mobile Application Management system, which is managed by your IT department and distributes in-house mobile apps over the air to the devices across your organisation.

### Updates

Distribution of your mobile learning apps does not end with delivery though. What if you want to update or amend content in your mobile learning? You need a way of updating learners with new versions. Of course, if you are publishing web apps, it is simply like updating a website. And if you are using an app store, whether private or public, you could push a notification to invite learners to re-visit the app store and get their update. However, then you are reliant on them actually getting around to doing it, which is also true if you send out a new media file. If you are using some kind of Mobile Application Management system though, it is possible to silently check which version of the app is on every device, and push the correct version to anyone who needs it, without any action required from learners.

## Security

Increasingly, organisations are permitting what has become known as BYOD (bring your own device). This has obvious cost benefits as there is no investment required in hardware. It also has a specific advantage for mobile learning: given the device has been chosen by, is the property of, and is likely to be familiar to, the individual, it overcomes any technological barriers to accessing the learning. There is a security issue though. If someone leaves your organisation, you cannot take the device back. Therefore, how can you remove your mobile learning apps from their device? The app stores offer a 'kill switch', but it is intended for dangerous, malicious or other unapproved apps, and this would remove the app from every learners' device! You could, of course, insist that the departing member of staff take their mobile device to your IT department for any mobile learning apps that are propriety to your organisation to be removed manually. However, perhaps the most elegant solution is achieved through a good Mobile Application Management system, which can manage the removal of mobile apps from specific devices over the air.

## Appendix: some examples of mobile learning

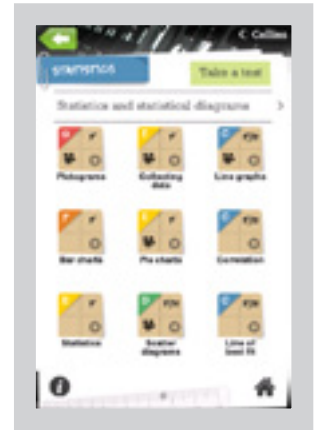
Having read the seven things everyone should know about mobile learning, here's some examples of what others have achieved. We hope it gives you some inspiration.

### Collins Education – revolutionising students' maths revision

Epic partnered with Collins Education to build a series of four GCSE maths revision apps for Apple and Android mobile devices. Containing 3-5 hours of content each, the apps were developed using Epic's authoring tool, GoMo Learning, and include full screen videos and zooming graphics.

The apps are available to the 700,000 students who undertake the Maths GCSE every year, and cover the entire GCSE syllabus (higher and foundation) for three different examination boards.

Launched in early 2011, the suite of apps have had over 20,000 downloads, received a five star rating on iTunes and won Gold for 'Best use of mobile learning' at the 2011 E-Learning Awards. A big feat for a small programme!



Just a fab app, and just in time for my module 5 exam next week!

Feedback on the Apple App Store

Working with Epic has been an enjoyable experience. The project manager was organised, positive and empathetic about our endless demands; she really went out of her way to lead her team to deliver a high quality product.

Jenny Lam, e-learning Project Manager, Resuscitation Council (UK)

### Resuscitation Council (UK) – mobile learning reduces costs

The Resuscitation Council (UK) educates healthcare professionals within clinical and community environments in effective methods of resuscitation. Epic developed an innovative solution to deliver their national adult Advanced Life Support Course (ALS) via PC, Apple and Android devices. This means learners can now access the site at their convenience, absorbing knowledge at their own pace, in their own time. This has other impending benefits too – face-to-face training has been cut by 50%, therefore saving in training costs.

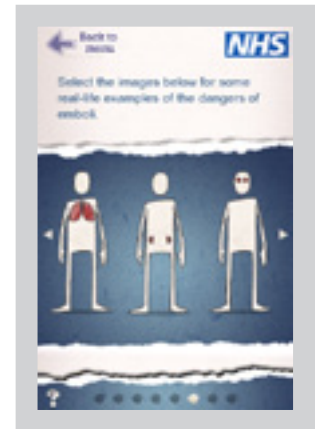
Accessible via a customised open-source platform, the content is complemented by numerous powerful resources such as e-lectures, animated case studies, quizzes and other support materials. This suite of information provides learners with standardised knowledge before undertaking the face-to-face training.

## NHS South Central – training on the move

Epic conducted a mobile research project for NHS South Central, investigating the feasibility of mobile learning within the NHS. Our report, peer-reviewed by Oxford University, showed that a move towards mobile was favoured by 80% of managers and 75% of practitioners.

To test these findings, two apps were produced using Epic's GoMo Learning authoring tool for Android and Apple smartphones and tablets: 'Compatibility of injectable medicines' and 'Adult drug calculations'.

Since roll-out in 2011, the apps have had 40,000 downloads, with this number rising daily. Replacing classroom training with mobile has saved costs and improved patient care, so it seems learning on the move could be the way forward for the NHS!

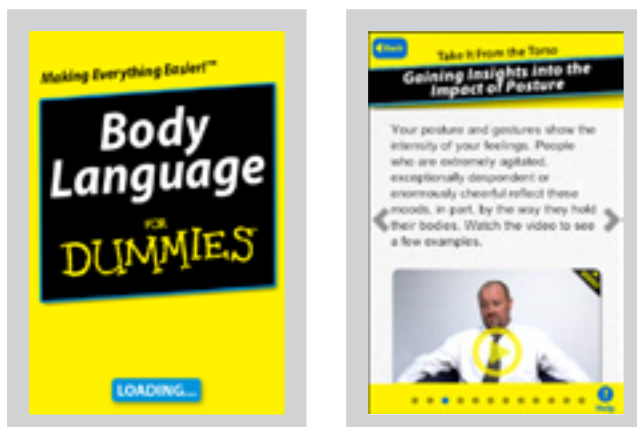


## Wiley – 'Body Language for Dummies' mobile app

Global publishers are recognising the need to reach their readers in new and innovative ways as an increasing number of people expect books in digital format, for instance as e-books.

Understanding this need to adapt to the evolving expectations of their audience, Wiley commissioned Epic to design not an e-book, but a mobile learning app to accompany the popular 'Body Language for Dummies' book.

The result is a concise re-working of content, each section of the app corresponding to a given chapter of the original book. Composed of entertaining and informative videos and interactive quizzes, the app provides two hours of mobile learning in an immersive and interactive non-linear format. It is available on Android and Apple devices.





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