

Moving mobile into the mainstream

Presenter

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Abstract

"The question is no longer whether m-learning works for hard-to-reach learners, but rather how best to fit it into your blend!"

In the short space of five years, mobile learning (m-learning) has moved from being a theory, explored by academic and technology enthusiasts, into a real and valuable contribution to learning.

In the UK, thousands of mobile handsets have been purchased as learning tools. User trials have successfully helped a wide range of hard-to-reach learners in many different contexts. The debate has moved on: the issue is no longer to show that m-learning works for these learners, but to understand the different learning models that best incorporate it, to analyse the costs and benefits, and to convince the education and corporate sectors to use mobile elements in their learning strategies.

Geoff and his team at CTAD have been key players in much of the experimental work in this field and have learnt many real and relevant lessons about moving m-learning into the mainstream. Their learning resources, pedagogical approaches, support systems and devices have been used with over one thousand learners across a wide spectrum of backgrounds and learning needs.

In this paper we will share some of the lessons learnt during our many user trials, as well as explain the framework we are using for current and future m-learning delivery.

Keywords:

mobile learning, user trials, case studies, mediaBoard, MMS, SMS, picture messaging, mobile phone, collaboration, communities of practice, mainstream provision, hard-to-reach learners, work-based learning, P900, XDA2, PDA, Pocket PC, CTAD



1. Background

Cambridge Training and Development Ltd (CTAD) has been an active participant in more than 20 m-learning trials across Europe, mostly in the UK.

Our learning resources, pedagogical approaches, support systems and devices have been used by over 1000 learners at the time of this paper.

The trials have been watched, evaluated and researched by several different institutions:

- Institute of Education (IoE), UK
- Learning and Skills Development Agency (LSDA), UK
- National Research and Development Centre for Adult Literacy and Numeracy (NRDC), UK
- Ultralab, Anglia Polytechnic University, UK

Feedback from the learners, the tutors and the evaluators has fundamentally shaped our approach to m-learning.

2. User trials

These trials have covered a wide range of ages, learning needs and contexts, but what all of them have had in common is that the learners were hard to reach, often outside mainstream teaching provision, and that the m-learning was being used as a tool to increase their engagement in learning. Some of the more visible trials are with:

- traveller families across Scotland, many recently housed
- young parents and parents-to-be in inner-city Birmingham; Practical parenting and health information via multiple media
- lorry drivers and their trainers in a large pharmaceutical company
- inner-city refugees and recent immigrants in Stockholm
- several projects in North East England grouped together as a Maths4Life Pathfinder, investigating m-learning to motivate potential numeracy learners
- an NRDC ICT Effective Practice Study, using m-learning with ESOL learners
- work-based promotional materials, raising literacy and numeracy awareness via sector-based phone and SMS quizzes. (15 sectors, 9 Java quizzes, 22 SMS quizzes, 150 000 SMS quiz flyers printed!)
- hard-to-reach learners in targeted workplaces – we have several other ongoing trials into specific work contexts: Care, Cleaning, Construction, Logistics, Sex work
- homeless support charities, working with residential adults
- driving theory test practice questions on your phone; this started as a theme in the original project, and has now become a commercial product.

3. Key lessons

Much debate has focused on the definition of m-learning. Is it about mobile learners? Is it about small personal devices? Is it about communication and collaboration? Is it about context sensitivity? Is it a natural extension to e-learning?

For the purposes of this paper, we will take the lead from the learner, and define m-learning as making use of whichever devices and technologies surround our learners, in an attempt to empower and enrich their learning, wherever and whoever they are.

Across our different trials, we learnt the following lessons:

It works, and reaches places other learning cannot

We know that m-learning can empower and engage. We know that the engagement and motivation can continue beyond the initial 'gadget honeymoon'. We know that learners are more comfortable engaging in personal or private subject areas using a mobile device than doing so using traditional methods. (Attewell 2005)

Best as part of a blend

Our different trials tried out a number of different approaches to using mobile devices. In some cases we used mobile phones that the learners already had; in other cases we provided them with high-level phones, or even PDAs. In some cases the learning was supplementing activities already underway; in others the learning activities were constructed around the mobile devices.

In almost all of these scenarios, we found that the learning worked best for both the learner and the tutor when it spanned the mobile device, and other media or group activities. Typically it was combined with:

- group activities
- paper-based materials
- other ICTs
- everything else tutors would normally do.

These findings are supported by other studies exploring the different approaches to learning and what opportunities wireless and mobile technologies can offer. The JISC innovative practice guide (Knight 2005) suggests distinguishing between these learning perspectives:

- learning as acquiring competence
- learning as achieving understanding (both individually, and collaboratively)
- learning as social practice

All of these can find a place in our blend.

It is a collection of pieces to be fitted to a learning need, not a single solution

When e-learning first became widespread, one of its biggest failings was the assumption that it could become a solution to all learning problems; that teachers were no longer required, and that anything could be taught using it. Success was only about 'broadcasting' good quality learning materials. We now know that this is not the case, and that good teachers, communication, collaboration and discovery-activities are essential.

The good news about m-learning is that it is very difficult to make the same mistakes because the devices being used are that much less powerful than PCs. There is clearly no single solution. Screens are smaller. Many have no keyboards. Connection speeds are slower. Processing power is weaker. There is no single

'platform' or set of features that dominates. The learning you can do on an iPod or MP3 player is very different from what you can do with SMS.

In the light of this, we have found it very helpful to describe mobile learning not as a single thing, but rather as a collection of new tools that can be added to a tutor's teaching toolbox, to be assembled as required to achieve specific aims. Some of these tools are:

- SMS (text messaging) as a skills check, or for collecting feedback
- audio-based learning (iPod, MP3 players, podcasting)
- Java quizzes to download to colour screen phones
- focused learning modules on a PDA
- media collection using a camera phone
- online publishing or blogging using SMS, MMS (picture and audio messages), cameras, e-mail and the web.

All of these are explored in much greater depth on the m-learning website (www.m-learning.org), the Get Mobile CD (CTAD 2005) and previous papers by the author (Stead 2004).

Not just for 'teaching', but for creating, collaborating and communicating

Given that our target users have often dropped out of school, and were almost always not strong performers when they were at school, being able to exploit different learning styles was a key feature of our work. Luckily for us, the very nature of m-learning ('collection of pieces') made this a fairly natural part of the mobile learning mix. Feedback from learners and tutors was very strongly in favour of this mix of learning styles.

Whenever our learners were a group who already knew each other, they were very keen to make use of the collaborative features of the mobile devices: beaming incomplete pictures and messages to each other so they could each add on their own bit; sending SMS, MMS and e-mails to one another. They figured out how to before we even had the chance to show them! Exploiting this as a learning tool provided us with a rich seam of enthusiasm and contribution from the learners.

Some of these activities made use of existing functions and features of the devices for picture taking and drawing, sound recording and writing text. Other activities used external software systems to combine these. The most useful of these was the mediaBoard (www.mboard.co.uk) which is an online scrapbook that users can send text and media files to directly from a camera phone or mobile device. (Colley 2005, Colley & Stead 2004, Stead 2004, Mellar & Kambouri 2005)

M-learning can be a bridge into IT

When working with young people, we expected them to be skilled users of IT, but we were surprised to find that a majority of our socially disadvantaged groups had no confidence in IT at all. In fact many learners actively avoided it. After our trials, several learners initiated steps back into learning, so that they could learn about e-mail, the Internet, word-processing and other IT related skills. For these learners this represents a massive shift in autonomy and motivation. This 'bridge into IT' is a result we saw in several other trials with different age groups as well. (Attewell 2005, Colley & Dixon-Trifonov 2005, Whyley 2005)

Practice makes perfect: just do it!

The final lesson is a softer one. We found that the best way to understand how to fit mobile learning into your teaching is to take the plunge and try it out. There is a

minimum of technical understanding and skill that tutors need to have before starting, but the majority of the learning, both for tutors and students, can happen on the job.

In some of our trials tutors had extensive training and their own PDA to practise on for more than a month before their learners started, to help them prepare. In other trials they started at the same time as their learners. In both scenarios the tutors felt that they did not have enough time to prepare, but there was no significant difference in the trial outcomes.

Does this result mean that there is no need for training? No. But what it does mean is that students are prepared to go on a learning journey together with their tutor. And that m-learning can still be a powerful tool when the tutor is only half a step ahead.

4. Different learning approaches

Much of the research and trialling has been carried out to establish whether mobile technology can be used as a motivating force, particularly with those disengaged from traditional education. However, it is becoming increasingly clear that this method of teaching and learning has a far wider application.

Broadly, m-learning seems to have a place at all stages of the accepted learning process:

Engage > Assess > Teach > Practice > Assess

Engage: The original m-learning project focused on the engagement of reluctant learners. The research clearly indicated that m-learning has a motivating appeal was confirmed in the NRDC Maths4Life Pathfinder (Colley & Tomlin 2005). The novelty and status of the devices, as well as the visual and auditory appeal of the materials, seem to be key factors.

Assess: Using m-learning to assess skills has several advantages:

- You can use the devices privately and in your own time.
- M-learning assessment is less threatening than paper-based screeners and initial assessments for new learners.
- M-learning is not as intimidating as computer-based assessment, which suits learners who are not comfortable with ICT.

M-learning screeners and assessments could be presented in a comfortable, informal environment and could be in a visually attractive 'health check' mode or in a form which more closely resembles the multiple-choice National Test format.

Teach: M-learning uses new, developing technologies. Consequently the appropriate pedagogy is also only beginning to form. It is clear that m-learning has a role in assessment and in practice. Currently, there is some debate as to how effective it can be to instruct or explain. Possibly this connects to deeper worries about ICT 'replacing the teacher', which m-learning certainly does not claim to do. On the other hand, there is some evidence that being able to look at learning as many times as you like, in your own time and at your own pace, might be the ideal way for some learners to understand a concept. As new generations of learners familiar with mobile technology emerge, perhaps this will become clearer.

Practice: Having material on your phone or palmtop means that it is always accessible to you. Whenever you have a spare five minutes, you can use it to practise some learning, just as you might choose to play solitaire whilst waiting for a train or bus. Learning materials that are colourful, engaging and stimulating make the learner want to go back and practise many times.

Assess: Both formative and summative assessment can be carried out using mobile technology, privately and independently, whenever the learner feels ready. This can be attached to a piece of learning, or on a larger scale, such as practice tests in literacy and numeracy, in preparation for a formal National Test. Other skills besides literacy or numeracy can also be assessed: for example, knowledge of a particular subject such as driving theory or practical job skills.

5. Making it work for you

Driven by the messages in this paper, and unable to match the demand we are encountering for our learning materials, CTAD is busy developing a suite of authoring tools to empower tutors to learn from our lessons, and to create their own, contextualised mobile resources and learning. Below is a preview of some of the current resources already available, or in the pipeline:

5.1. **GetMobile CD:** We have collected together almost all the learning materials that have been created for all the projects mentioned above and made them available on a CD, together with a teacher-focused set of resources, instructions, tips and tricks. This was released late 2005 and is available to all.



5.2. **mediaBoard:** One of our most successful tools for collaborative working has been the mediaBoard. It is a flexible, web-based tool which enables tutors to create their own interactive learning tasks and projects. Some fairly typical learning scenarios are

- working as a team to give and receive directions and instructions or negotiate and agree how to solve a problem
- following directions or answering questions to complete a task
- making enquiries, conducting interviews or surveys, and recording speech or other audio
- using photographs and audio
- adding and editing text to create a multimedia web site
- learning about and using the internet and mobile technologies.

Each mediaBoard you set up is a bit like an internet message board that students can send text, pictures and sounds to from their phones. However, the mediaBoard is a visual image, and the messages, instead of being organised in a linear way or in discussion threads, are collected around different parts of the image, like locations on a map. Users can attach audio, text and images to the zones on their mediaBoard by uploading them from their computer via the web, by e-



mail, or by multimedia message (MMS) from a handheld computer or a mobile phone.

The mediaBoard was first introduced at MLearn2004 in Rome, where all delegates contributed to a live session of capturing and recording media. It is still being used in several projects around the world, and will become commercially available from early 2006.

- 5.3. **SMS Quiz builder:** Many projects across the world have looked at using SMS (text messaging) to deliver learning. Some have succeeded, some have failed. Our most popular and effective approach by far has been to combine different media so that a potential learner is given some initial information not via SMS, but via some other means: a poster, a flier, a book, a projected screen. Included within that information is a short quiz, with a number to SMS their answers to. A single text message contains all the answers for the entire quiz, and they get a single reply with the results, and follow up information.

This structure has been developed into a standalone web-based authoring tool, first trialled at an all-day authoring workshop at the Mlearn2005 conference. It will be available commercially from the start of 2006.

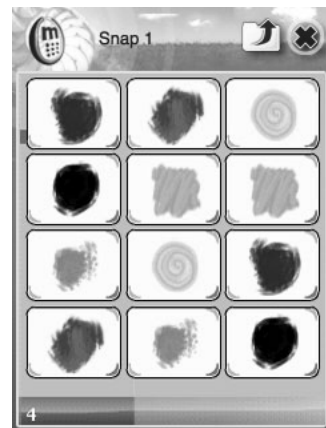
- 5.4. **mobileBuildit:** If you are interested in using larger handheld device like a PDA for your m-learning, it helps to have existing, relevant content to include on it. This is a real challenge because the small, compact nature of all good m-content means that a motivated student can work through lots of it!

We have created over 50 modules of trialled and tested, curriculum mapped content to run on any PocketPC device. Along the way we have developed several templates and frameworks which embed the best practice and learning design that seems most effective.

These templates have been added to a PC-based authoring tool that lets tutors create their own versions, putting in their own content but using our interactivity. The simplest example of this would be a quiz or a PowerPoint-type presentation, though there are several more 'game-like' activities, all of which can now be created by any tutor using our authoring system.

But the content is only the first part. There are three other aspects of creating PDA-ready learning materials that we can help with:

- installing the materials to the device
- helping the student navigate around your materials
- tracking and reporting on use.



All of these are dealt with automatically when you use the authoring tool. When an author creates new materials, these are turned into a full PocketPC installation at the click of a button. When new materials are installed, they are automatically assembled into a shared menu of all the learning materials on that device. And there is the option for different users to keep records of the time they spent on different learning activities.

These different parts of the authoring process may seem normal for tutors used to e-learning, but they are almost unknown in the offline m-learning world due

to rather unwieldy technical challenges associated with the platform that are beyond even the most technically bold of tutors. With mobileBuildit they come as part of the package.

The product is currently being trialled in the UK and Australia, was also used during MLearn2005, and will be available commercially from early 2006.

6. Summary

Mobile learning works. We know that it reaches parts that other learning does not, and is especially powerful for disadvantaged learners. We are also collecting evidence that the same learning approaches are powerful tools for mainstream learners too. You don't need to be hard to reach to benefit from the empowering effects of being trusted with a mobile device and engaged in creative learning.

We also know that there are many different technology pieces that contribute to the m-learning puzzle. If you are a rural family in Africa, the only technology option available to you is SMS. If you are a refugee in Stockholm you are likely to be able to access the Internet on your phone. Both of these are valid learning tools, but they should be seen and used in different ways.

And finally, a reminder. The first step into m-learning seems to be the most important. In a majority of our trials, the organisations have continued to do their own m-learning long after the trials have finished. The key starting point for them on their m-journeys was taking that first step, and trying it out. Now, many are creating their own m-learning.

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