

RESEARCHING MOBILE LEARNING WITH COLLEGE TUTORS – OPERATIONAL ISSUES, LESSONS LEARNED AND FINDINGS

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Abstract

Many educators are becoming interested in mobile learning as an alternative, or supplementary, way of delivering aspects of teaching and learning, or as a conduit to lead ‘disengaged’ youth to further learning, or as a mixture of both. This paper describes the Mobile Learning Teachers’ Toolkit project, where 19 UK college tutors were able to author their own mobile learning materials to cater for the specific needs of their students in their particular context. Also discussed are the challenges involved in setting up a mobile learning project, and some of the lessons learned.

1 Introduction

This project builds on the experiences of the m-learning project (<http://www.m-learning.org>). m-Learning was a three-year pan-European research and development project which used handheld technologies to provide literacy and numeracy learning experiences for hard-to-reach young adults (aged 16–24) who were not in full-time education and to promote the development and achievement of lifelong learning objectives. The m-learning project focused on the experience of the young adults involved, and project findings can be found in Attewell (2005).

Since the m-learning project finished in 2004, two of the partners, Learning and Skills Network (LSN, formerly Learning and Skills Development Agency) and Tribal Cambridge Training and Development (CTAD), have taken forward the learning materials and systems work by developing a toolkit of three applications which teachers and tutors can use to author their own mobile learning materials and quizzes. This is in direct response to the findings of the m-learning project, ie that tutors want ownership and involvement, they want resources which are appropriate for their learners, the subject and curriculum being taught, at the right level, in the right context, and suitable for the teaching and learning environment. Thus a toolkit was developed with the aim of:

“enabling providers to develop mobile learning materials for their particular students and context, to evaluate the toolkit and to develop advice and case studies to share good practice”.

2 Research and Operational Issues

During the project, LSN and CTAD explored the tutors' reactions to the toolkit and, in particular, their perceptions of:

- a) How use of the toolkit impacted on their teaching
- b) How use of the toolkit impacted on their students' learning and interest in learning
- c) How use of the toolkit was integrated into the curriculum for their students

Therefore, the main focus was on the experiences of the tutors involved, rather than that of their students (although any data received from the students was incorporated).

A number of colleges were approached to take part in the research project by LSN, some of which had taken part in mobile learning projects previously, and others which were new to mobile learning. Five colleges were recruited to the project, three in the North of England, one in the West of England and one in Wales. At the start 26 tutors agreed to take part, although by the end only 19 tutors had actively used the toolkit. Two tutors withdrew because an impending college inspection curtailed their involvement, three withdrew because of a shortage of time to participate because of college teaching demands, one had an accident requiring hospitalisation and one used the mobile device but not for anything connected with the project. Thus 19 tutors completed the project (some of whom had no previous use of using a palmtop computer), and who taught a variety of subjects such as childcare, literacy, numeracy, e-learning and learning technology, English for Speakers of Other Languages (ESOL), English as a Foreign Language (EFL), computing, media production, business studies, special needs, hospitality and key skills. There were 14 female tutors and 5 male tutors, and the main research period was January to April 2006.

Due to the small-scale nature of the research and the wide geographical distribution of the tutors, it was decided that questionnaires were the most practical way of collecting the data. Pre- and post-use questionnaires were used, containing a mixture of open and closed questions to allow both ease of completion and the opportunity to add personal thoughts and experiences as relevant. The questionnaire data was supplemented by data gathered from the tutors' use of the extranet¹ and, at the end of the project, the tutors were asked to describe and supply copies of their most successful games, quizzes and mediaBoards as examples of good practice for others interested in mobile learning.

Importance was placed on training for the staff involved in how to use the PDAs, the toolkit and the research activities which would be required. A one-day workshop was held with the co-ordinators in each college who were unknown to the project team, and a one or two-day training session for the tutors taking part (to fit in with local requirements and taking into account that it needed to be organised around teaching commitments and part-time staff are only available on certain days). The tutors were

¹ An extranet is a password-protected website, which uses internet technology to share documents securely and to facilitate collaboration, discussion and support.

given background information about the project, explanatory guides on the tools and the PDAs, and encouraged to use a dedicated extranet site which allowed all the tutors to communicate with each other and the project team and share resources.

All staff who took part were given PDAs. These were XDAlls, which were originally used in the m-learning project, and were fitted with prepaid (or pay-as-you-go) SIM cards by the network providers who were considered to offer the best service in each location where the PDA would be used. Tutors needed to have access to PDAs in order to test fully the games which they might design, as they were created on a PC and downloaded directly to the PDAs. PDAs could be borrowed by tutors, so that they could use the games with their students. A set of ten were available from the project team and several of the colleges involved also had PDAs available for tutors to borrow. For the creation of SMS quizzes and mediaBoards, PDAs were not required, the tutors only needed access to the PC, and then the students would use their own mobile phones to take part for which they would be reimbursed.

Although it was not possible to offer colleges any money for participating in the project, it was agreed that the tutors who took part in the project and who returned the research data required, could keep the devices at the end of the project. In all but two cases this happened, but one college insisted that the devices used by the tutors became college property at the end.

One of the findings from the m-learning project, was that it is important to support the people involved in mobile learning projects in order to ensure that any problems are dealt with quickly (Attewell, 2005). First-line support was offered by two LSDA staff, who were available by telephone, e-mail and mobile phone. Help was also available through the project's extranet, text messages were sent to tutors asking if they had any problems, and a consultant visited some colleges in order to resolve MMS problems which were difficult to address remotely (see section 5.3).

3 The Mobile Learning Toolkit

This section describes the 3 applications provided in the toolkit, namely the SMS quiz engine, the mediaBoard and the learning games. A brief description of each tool is noted below, together with an example of the work created by the tutors for use by their students.

3.1 The SMS quiz engine

The SMS authoring tool allowed tutors to prepare multiple-choice quizzes which their learners could access using their own mobile phones. Such quizzes are designed online, using a desktop computer, and then students text their answers in a numerical string to a specific address and received an automated response designed by the tutor (who also had the ability to send up to 7 daily follow-up messages after the initial text message had been sent). The tutors were able to access a reporting function of the tool in order to see the answers received from different mobile phone numbers (so the tutors needed to know these in advance) and the date/time messages were sent. Arrangements were made with the tutors to reimburse learners for taking part in these activities using their own mobile phones.

By the end of the project, the tutors reported that 36 quizzes had been created, which took 58.5 hours, and were played 328 times by the students (NB this is the number of times quizzes were played, not the total number of students taking part because some students played several quizzes). More than half the tutors said it was either “very easy”, or “easy” to create quizzes, and tutors stated that the questions which were devised were the single most important success factor for its use.

The following is an example of one of the SMS quizzes created by a tutor for the National Diploma in Animal Management course at level 3. Eleven students independently used the quiz, where the tutor used it to test learning during a teaching session. The questions and possible alternative answers are shown below with the correct answers underlined. The students responded with an SMS message including the answer numbers, ie a student texting 32341 would have 5 correct answers.

- A. What is an ectoparasite?
1. A disease that affects parasites
 2. A treatment for killing parasites
 3. A parasite that lives on the outside of the body
 4. A person responsible for recording parasite occurrence
- B. Fleas and lice are....?
1. members of the teleost group
 2. insects
 3. arachnids
 4. related to woodlice
- C. Lice have eggs which.....
1. roll off the host as soon as they are laid
 2. are spherical and are laid in clumps
 3. Remain tightly glued to the base of the hair
 4. are easily removed by light grooming
- D. Tapeworms have.....
1. a well developed digestive system
 2. a body with no clear segmentation
 3. complex dances to attract mates
 4. segments that are shed daily containing thousands of eggs
- E. Which of the following is a common tapeworm of dogs and cats
1. *Dipylidium caninum*
 2. *Architeuthis pseudoargus*
 3. *Alca torda*
 4. *Toxocara canis*

The following table shows the automated answers the students would receive depending upon the number of correct answers they gave. Therefore, if the student had only one correct answer, they would receive the second message in the table. It was also possible for the system to insert some information into the reply automatically (eg the response format ‘you scored ###/5 and got *** right’ might generate a message to the learner stating ‘you scored 3/5 and got A, C and D right’).

The example below was created by a tutor in a college in Wales and, therefore, the feedback is provided in both English and Welsh languages.

○ 0	○ 1	○ 2	○ 3	○ 4	○ 5	
•						You got #/5. It's probably time to check your notes and try again later! #/5 Amser edrych ar y nodiadau a ceisio eto!
	•					You only got * correct. Check through your notes and try again later #/5 Amser edrych ar y nodiadau a ceisio eto!
		•				You only got ** correct. Check through your notes and try again later. Atebion ** yn gywir. Edrychwch ar y nodiadau cyn ceisio eto.
			•			You got #/5 correct. Answers *** were correct. #/5 yn iawn. Oedd atebion *** yn iawn.
				•		You got **** correct ! Check the wrong answer in your notes. **** yn iawn ! Edrychwch yn y nodiadau am yr ateb arall.
					•	All answers correct, well done! Atebion I gyd yn iawn, Da iawn!

Afterwards the tutor reflected that this activity allowed the students to undertake learning activities, and retry them, getting feedback when not in the classroom. As a different type of activity it “*stimulated their interest*” in learning.

3.2 The MyLearning games authoring system

A number of games were developed for use on the PDAs by tutors using the authoring system on their PCs. These were then download to the PDAs either using the docking station or the SSD (small disks) provided. As the use of these games was not dependent on online access the students did not incur any charges themselves for using them. Tutors could create simple card games including pairs games (where 8 or 12 cards showing images, text, or a combination of both are displayed on screen and turned over so the learner has to remember and indicate where the matching pairs were) and snap games, as well as multiple-choice quizzes including pictures and text.

By the end of the project, the tutors reported that 31 games had been created, which took 42 hours, and were played 288 times by the students (124 for the pairs games, 92 for the snap games and 72 for the quiz games). More than half the tutors rated the experience of creating all types of games as “*fine*”. Tutors stated that the importance of the games being appropriate and relevant in terms of learning and the subject studied were the most important factors affecting their use.

The following is an example of a quiz game created by a tutor for the National Diploma in Media Production at level 3. Twelve students working independently used the game, where it was used in question and answer sessions and the tutor considered it made the session “*more attractive to learners*”.

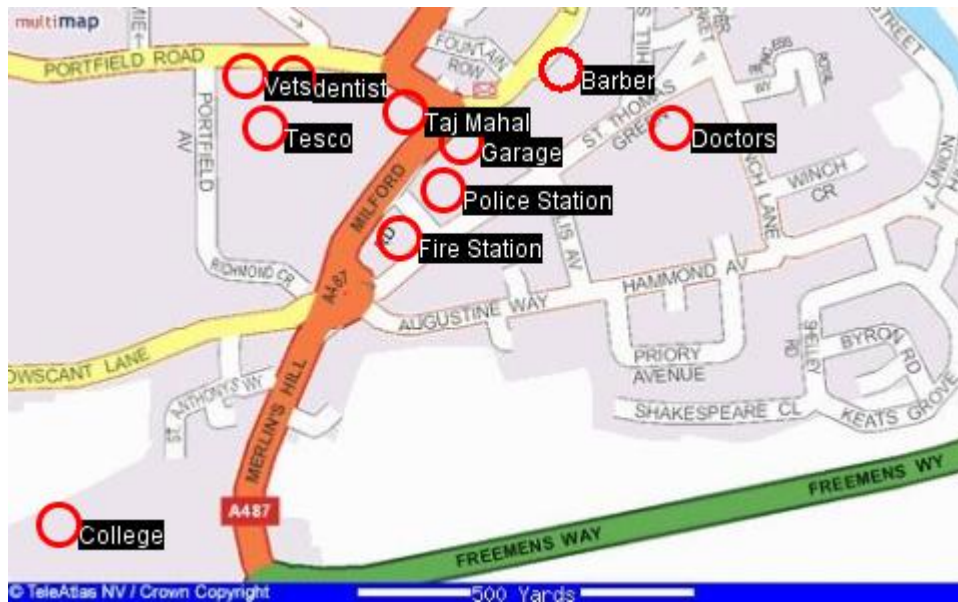


3.3 The mediaBoard

The mediaBoard can be envisaged as being similar to an Internet message board, in that the tutor creates an image on a web page using a desktop computer (PC). This image can be a picture or diagram, such as a local map of the area. The students can then take part in a collaborative exercise including sending text and multimedia (picture and audio) messages to the map and to different themes relating to the board (eg locations on the map). An example of this is students exploring their local area, taking photos which they send to the appropriate location on a map, upon which they can receive a text message alerting them to visit another location with a task and so on. Such messages can then be viewed online back at college, where accompanying text can be added and changed. As with the SMS quiz engine above, the cost of the learners using their own devices to send SMS/MMS messages to the mediaBoards was reimbursed.

By the end of the project, the tutors reported that 28 mediaBoards had been partially or fully created, which took 25 hours, and were accessed by 57 students. However, because of problems related to difficulties in sending and receiving MMS messages (see section 5.3), the mediaBoard facility was not used as much as was hoped. Most tutors gave feedback concerning the importance of good network reception and ease of use of MMS for successful use of the mediaBoard.

The following is an example of a mediaBoard created by a tutor for an elementary course in English as a Foreign Language (EFL). Fourteen students used the board, working in pairs, as an orientation exercise to the local area. Afterwards the tutor stated that the students “*loved getting out of the classroom and using information and learning technology*”.



4 The challenges in setting up a mobile learning project

The partners experienced a number of challenges in setting up and running this project which it may be useful to describe in order to inform the work of others contemplating mobile learning projects. These challenges concerned:

- Sourcing the devices to be used
- Deciding on the most appropriate charging tariff
- Deciding who should pay for chargeable services (eg for sending text messages)
- Setting up effective support, communications and information exchanging channels with tutors, many of whom work on a part-time basis
- Installing software in colleges and liaising with technical gatekeepers

The lessons we have learned in the context of these challenges are discussed in the next section.

5 Lessons learned

5.1 Unlocking the mobile devices and obtaining system settings from network operators

The devices (XDAlls) used for this project were originally bought for use in the m-learning project. For the toolkit project they needed to be unlocked from their previous service provider, O₂ in order to allow them to be used on other networks. This was found to be difficult for the staff involved, who did not have significant technical expertise. Advice was sought from the network operators who were generally found to be unhelpful or who stated they did not support the devices. Eventually the problems were solved with the advice from the XDA developers' forum².

² <http://forum.xda-developers.com/viewtopic.php?t=24779>

After the devices had been unlocked, each network operator (this study used four different providers, which tutors recommended as providing the best service in the different areas where the tutors were located) required different settings to be entered in the PDAs to ensure that they worked with their particular communications systems. These proved difficult to obtain because a) most calls to network operators are taken initially by call centre personnel who are not necessarily familiar with the devices and were found only to be able to answer simple, routine questions; and b) it is difficult to contact technicians directly, and some technicians are reluctant to help when the PDAs being used are not usually supported by their organisations.

5.2 Deciding on charging tariffs

Because the research period was shorter than the standard contract terms offered by network operators, and in order to control costs, the use of top-up cards with pre-paid SIM cards was chosen, rather than a contract. As four different network operators were involved, it was a lengthy process to acquire the cards (some shops were reluctant to supply more than a couple of top-up cards) and link the top-up cards to the SIM cards and place credit on the PDAs.

5.3 MMS problems

Unexpectedly, the decision to use pre-paid SIM cards had a negative effect on the project and, particularly, on the use of the mediaBoard. It was discovered that some network operators provide an inferior service to customers who use the pre-paid service compared to those using the service on a contract basis, particularly regarding MMS. Many of the MMS messages sent during the project never arrived and when the network providers were contacted they were often unable to explain why this was so, or to provide assistance. The importance of reliable network support for mobile learning involving the use of MMS cannot be overstated. Therefore we would recommend that other projects considering the use of MMS do not use pre-paid services.

5.4 Deciding who should pay for chargeable services

It was expected that the students taking part in the SMS quiz and mediaBoard activities would use their own mobile phones. In some cases students told their tutors that they were happy to incur the cost of a few calls in order to take part. However, other tutors reported that many of their learners often had no credit available on their mobiles. The project partners and tutor co-ordinators discussed a number of options for reimbursing these students. Eventually it was decided that each tutor should discuss this matter with their students and decide the most acceptable solution for each group. The tutors would then implement this solution and the cost of this would be reimbursed by LSDA. At the end of the project, nine tutors stated their learners used their own mobile devices, and examples of reimbursement included £1 Boots vouchers and McFlurry™ ice creams.

5.5 Setting up effective communications and support

Setting up effective communications and information exchange channels was a challenge. Support for the tutors was available by telephone, e-mail and mobile phone, and through the project's extranet. Almost all the support required by the tutors was found to be technical and supporting them was time-consuming. It was also often difficult to contact tutors in order to discuss or respond to their problems. Communication difficulties were a result of:

- tutors not having ready access to a landline telephone
- tutors having difficulty using the PDA as a mobile phone (eg network reception when tutors were not located at the college)
- lack of easy access to a computer (for e-mail)
- heavy teaching commitments
- difficulties contacting part-time tutors as they were only available on certain days

Any institution planning to introduce, or trial, mobile learning, needs to ensure they make adequate provision for technical support which is driven by the needs of the users and takes into account their work patterns and working locations.

5.6 College ICT facilities and technical gatekeepers

At the beginning of the project a number of software applications needed to be installed on the tutors' PCs, ie the MyLearning games software, ActiveSync and Flash. This was found problematic in most of the colleges, as the IT departments do not allow tutors to install software packages themselves. Many tutors experienced frustration due to having to wait for technicians to load programs on their behalf, sometimes only on one PC at a time, one package at a time. Some tutors circumvented these difficulties by sharing computers or by using their home computers, or laptops, which were not firewall protected. These delays reduced the amount of time available for tutors to use the toolkit. When planning a mobile learning project in a college, we recommend early discussions with, and involvement of, the IT support staff in order to avoid problems during implementation.

Also, it is recommended that tutors planning mobile learning activities check beforehand with their institutions that there are no restrictions on the use of mobile phones. During this research some tutors had planned to provide mobile phone based career-choice activities for visiting schoolchildren. However on the day of the visit they discovered that the children had not been allowed to bring their mobile phones with them. Thus, mobile learning initiatives can be easily derailed by local restrictions and the attitudes of institutional management if there has been insufficient consultation.

6 Conclusions

This project offered tutors based in five further education colleges the opportunity to create mobile learning materials for their students, catering for their specific needs in their particular context. Tutors found it easy to integrate the use of the toolkit, learning materials and activities into lessons and almost all of the tutors were keen to

continue using the toolkit with their students in the future. This project has also highlighted some of the challenges researchers and tutors face with mobile learning projects and identified some lessons learned which could be useful to others considering undertaking mobile learning activities in the future.

7 References

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