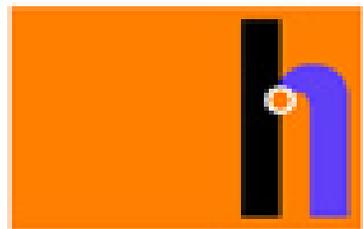


M-Learning Project Report

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Learnhigher

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Introduction

“The current generation of young people will reinvent the workplace, and the society they live in. They will do it along the progressive lines that are built into the technology they use everyday – of networks, collaboration, co-production and participation. The change in behaviour has already happened. We have to get used to it, accept that the flow of knowledge moves both ways and do our best to make sure that no one is left behind”.¹

Mobile learning (m-learning) will soon reach a ‘tipping point’ where the necessary infrastructure (devices and networks) is routinely available and ready for exploitation. Teachers and lecturers need to be equipped with tools which are easy to use, flexible and time-efficient. These tools must encourage collaboration, conversation and participation and support structured delivery, assessment and progression. Schools in some regions of Europe and, in particular, parts of the South East Asia (e.g. Korea) are routinely using handheld computers and other mobile devices for teaching and learning. At the same time broadband connectivity is increasing and is becoming more affordable, to the extent that it need no longer be a constraint on usage. Inexpensive mobile devices are beginning to contain advanced functionality such as GPS, while the ‘standard’ mobile phone now has a digital camera capable of recording both still and moving images at acceptable resolutions. The basic infrastructure is therefore in place for exciting new developments in technology-enabled learning, which have widespread application – taking them beyond niche and project-based applications into the mainstream.

While these developments have been taking place there have been rapid developments in the sharing of content of all types, including personal data and personal creativity, aided by Web 2.0 technologies. Earlier EC projects, including the Heritage for All strand of FP5 (where MMU led the COINE project²), demonstrated that the creation of sharable objects by children, within a safe pedagogical environment, was feasible and attractive. Europe's i-2010 strategic initiative calls for the use of new technologies to support

¹ Green, H. and Hannon, C.(2007) Their Space: education for a digital generation. London: Demos.

² COINE enabled users to create their own multi-media stories, often related to local or personal history, using pre-set ‘templates’ to guide them through the process.
<http://www.cerlim.ac.uk/projects/coine/index.html>

creativity and enhance the user experience, by making content more interactive and giving more control to the user by accepting the convergence challenge to the traditional relationship between content creation, the media and the consumer. Children of school age are experienced users of both mobile devices and Web 2.0 technologies, often having greater familiarity with them than their teachers and parents. Indeed they usually simply take them for granted (see below).

Research, including work funded under previous Framework Programmes, has shown that these technologies are capable of being harnessed to promote real learning. For example, the eMapps.com project³ successfully used game templates to enable teachers to create individualised 'alternate reality' games for their classes.

In the period since 2000, mobile learning has moved from being a theory, explored by academic and technology enthusiasts, into a real and valuable contribution to learning. Mobile Phones outnumber PCs 3 to 1 and have features such as web access and technologies like Java. Mobile phones and PDAs are no longer just for chatting and organising contacts and diaries, they are now pocket-sized computers and as such have the ability to deliver learning objects and provide access to online systems and services. The arrival of multimodal handheld devices such as the iPhone and the enabling of GPS are continually adding to these learning capabilities.

With such a ubiquitous tool the temptation to create mobile learning content is overwhelming. But research is still needed to determine and demonstrate the precise ways in which mobile learning can most effectively be introduced into the learning mainstream. This research aims to identify current developments in mLearning in UK higher education and to assess the use and viability of learning objects delivered via mobile technologies.

The objectives of this study were two-fold:

³ eMapps.com used mixed reality games and handheld devices to enhance schoolchildren's learning. <http://www.emapps.com/>. MMU, MDR, ICIMSS, NYMESEK and CELN were partners in this recently-completed project.

1) To survey UK HEIs to ascertain current developments in mLearning in higher education in the UK to date, with reference to developments in other educational areas to identify future expectations from the next generation of students entering UK HEIs.

2) Development and piloting of two learning objects to be delivered and accessed via mobile devices. The two learning objects are:

- Analyse This!!!
- ASK, the Assignment Survival Kit
-

The learning objects are now available from LearnHigher at

<http://www.learnhigher.ac.uk/analysethis/mobile/>

<http://www.learnhigher.ac.uk/ask/>

This report firstly covers the objective of study: to survey UK HEIs to ascertain current developments in mLearning in higher education in the UK to date. It then goes on to report on a series of interviews with schools to explore current practice and future directions in mobile learning. Finally, it provides an evaluation of the mobile version of Analyse This!!!

Methods

To achieve the objectives of the M-learning project, the following research methods were adopted:

- Desk research – to identify current research and application of m-learning.
- Deployment of an online survey to learning technologists in UK HEIs to establish a baseline of current practice in the development and delivery of m-learning.
- Follow-up interviews/focus groups with key individuals to explore further emerging issues/challenges/examples of good practice.
- Development of two existing learning objects for delivery and access via mobile devices - hand held computers or smartphones. The two learning objects to be:
 - Analyse This!!!
 - ASK, the Assignment Survival Kit

- Evaluation of the use and viability with students of mobile Analyse This!!!

Analysis of survey data and user evaluations involves descriptive and inferential quantitative techniques. Focus group/interview data has been analysed using a qualitative approach.

Developments in mLearning in UK higher education

The section of the report provides findings from an online survey and two focus groups, undertaken in late 2008 to gather information on the following aspects of M-Learning:

- To identify current developments in mLearning in UK higher education
- To assess the use and viability of learning objects delivered via mobile technologies
- To identify future expectations from the next generation of students entering UK HEIs.

The survey was in four parts:

- User profile
- Learners and their learning experience
- Learning and teaching
- Technologies and infrastructure

Following the survey, 2 focus groups were undertaken to allow more depth of discussion on M-learning issues and to pick up on points of interest raised in the survey. The following broad topic areas were covered and have been integrated into the survey findings, where appropriate:

- Learners and their learning experience
- Support and training
- Assessment and feedback

- Investment in ICT and mobile learning

Survey profile

Survey respondents were asked about their role in the institution where they worked. Figure 1 below illustrates the spread of roles and responsibilities. The majority (21) were lecturers, followed by learning technologists (15) and e-learning co-ordinators (14). Eleven of the respondents were researchers and 2 were m-learning co-ordinators. Twelve selected 'other' and identified their roles to be:

- Combination of all 3 but primary function is advice / consultancy
- Director e-assessment adviser education commissioning educational technologist/Innovator
- Librarian (2)
- Project Manager (3)
- Senior advisor
- Service manager.

Figure 1: Role in institution

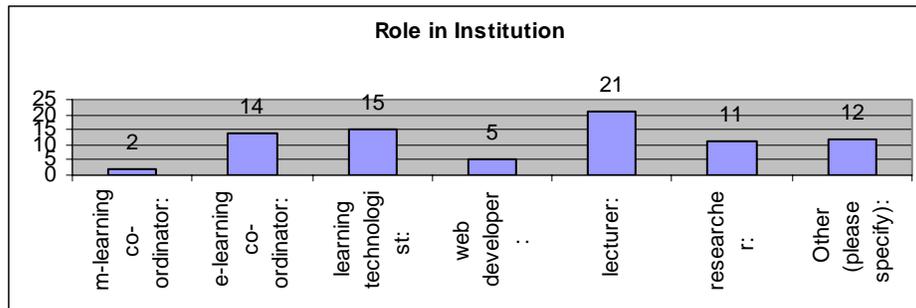
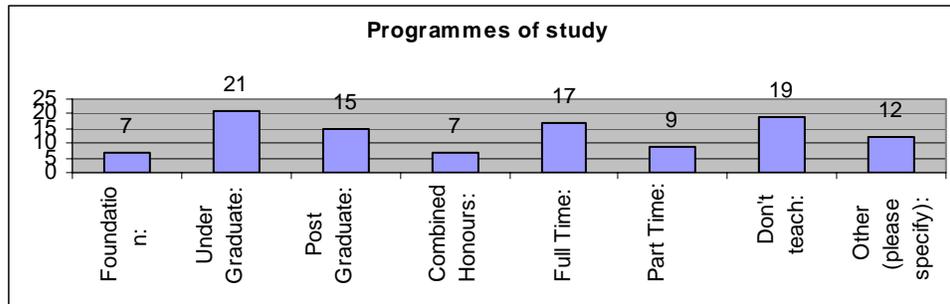


Figure 2 below shows the programmes of study respondents were involved in. Twenty-one teach under-graduates, 15 teach post-graduate and 7 teach on foundation courses and 7 on combined honours. Seventeen teach full time students and 9 teach part-time students. Nineteen of the respondents do not teach on a programme of study. Twelve selected 'other' and identified the programmes of study they were involved in teaching to be:

- Staff development and support academic staff who wish to implement learning technologies (6)
- Sixth form students
- Support a range of courses and get involved with individual student projects
- Support staff and students in the use of e-learning.

Figure 2: Programmes of study



Thirty-nine respondents said they were personally involved with research into m-learning delivery, and 26 said they were personally involved with developing m-learning and in the delivery of m-learning. Respondents gave many examples of the type of activities they were involved with, these included:

- As Project Manager for the XXX Project I have been involved in elements of research, the development of a site where students could share their findings and reflections and supporting staff cross the institution with the use of mobile technology in Teaching and Learning
- Currently researching how users with disabilities are affected by using mobile technology. I am involved in the development of the ALPS project as well in house mobile projects (student mobile platform, response system, learning objects)
- I am responsible for developing staff in the area of using podcasting in learning and teaching. We are also developing some windows PDA based resources for teaching archaeology students basic fieldwork skills.

- I set up and help to coordinate a number of Communities of Practice, including blended learning, podcasting, Second Life.
- Podcasts developed by students are being made available in mobile formats to increase availability. This makes more material available to students, and is part of the construction of a library of RLOs.

Some participants were not involved in either researching, developing, or delivering m-learning. Comments included:

- None of these - have just been trying it out with some students.
- Not actually actively involved but I am interested.
- No, I do not believe m-learning is useful.

Thirty-three respondents were involved in specific subject areas, and of these 33 were involved in a learning technology unit such as:

- Academic Innovation team
- Learning and Teaching Institute
- Access and Distributed Learning
- AD Blended Learning & the UV VLE project.
- CeLT (3)
- Member of eLTaG group in the Institute of Education Centre for Learning & Teaching,
- Centre for Learning and Teaching (2)
- E-Learning Development Team.
- Education Support Unit
- Educational Development Unit (2)
- eLearning Unit
- ILT centre
- Learning and Teaching Services
- Learning technologies Group
- Medi-CAL Unit
- A national data centre - a centre of expertise hosted within a university.

- Molenet
- Moodle Champion (2)
- Podcast group
- Quality in Learning and Teaching (QuILT)
- Focus group within both JISC and the Higher Education Academy specialising in advising on the use of technology to support disabled staff and learners.

Thirty-eight of the respondents were aware of Centers or Units focusing on learning technologies (such as those names above), 15 were not.

Focus group profile

Two focus groups were undertaken, with 7 participants at the first and 6 at the second. Participants were asked to provide a brief description of their roles within their institution:

- Project officer at a university, involved in research relating to m-learning.
- University lecturer and e-learning co-ordinator.
- University senior lecturer, uses a VLE and is a Moodle champion.
- College lecturer, not yet involved in m-learning but uses mobile technologies for student support purposes.
- E-learning technologist, involved in m-learning activities.
- College service manager, working with m-learning and online distance education.
- Part-time university lecturer, undertaking a PhD in mobile learning
- Senior advisor for a service looking at accessibility and learning, and inclusive teaching.
- University Centre for learning and teaching, responsible university wide for supporting learning technologies
- University multi-media producer, project co-ordinator for the information communications technology services
- University service which is partially funding national data centres, with a strong interest in mobile technologies.

The following sections provide results of the survey, together with relevant discussion topics raised discussed by the focus groups participants.

Definition of mobile learning

The study has attempted to define the terms 'mobile learning' and 'm-learning'. Mobile learning is sometimes referred to as 'wireless technologies' or 'mobile and wireless technologies'. M-learning can also refer to 'mobile e-learning', where e-learning can be accessed (almost) anytime and anywhere that suits the learner, using portable (mobile) devices. Mobile devices include Smartphones, high specification mobile phones, PDAs, handheld computers and Ultra-Mobile PCs (UMPC) that can access the internet using the mobile phone networks or 'Wifi' wireless access points.

Definitions were also discussed at both focus groups, with varying opinions on what made the learning experience a 'mobile' one. For example should it apply to '*something you can access through a mobile device, so anything you can get on my phone, PDA, smart phone, or anything that has got internet access so that I can get to resources using this*'; should it include laptops, or any device that is portable and therefore mobile; or should it include '*anything you can take outside the classroom*'?

One participant described the following definition provided at a conference:

'I was at a conference a few months back and they defined it as a device you can hold and operate with one hand. A laptop you can't, you can't hold it one hand and operate it, and I think it is possible to define it with less than a 9inch screen.'

It was generally agreed that the definition is blurred, but a useful way of defining 'mobile' learning is:

'... to take the definition that it is away from the geographical constraints, the physical link to the actual campus or the ability to move around the campus, or outside the campus, whether it is a laptop, notebook, or a PDA device'.

Examples of mobile learning devices were also discussed, and included:

*‘two-way devices, mobile phones and smart phones, PDAs, and then one-way devices such as iphones, MP3s, ipods, that sort of t
‘A smart phone device ... a device that fits in one hand’.*

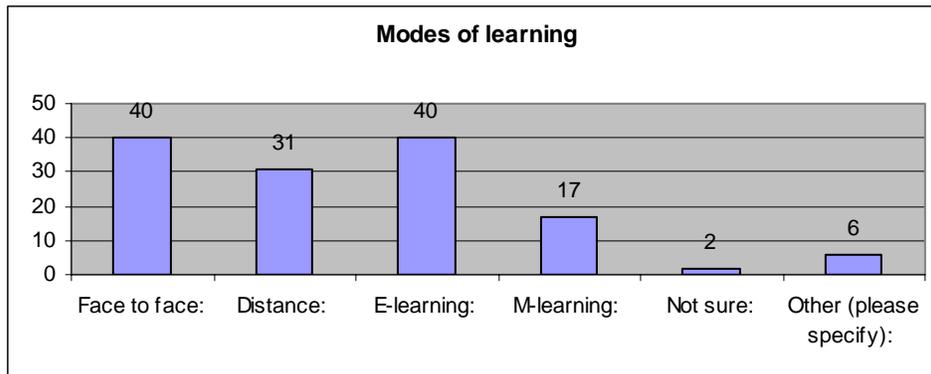
‘... the single common thread is wireless ... the number of devices is very numerous’.

Learners and their learning experience

Survey respondents were asked what modes of learning were currently used in their organisations. Figure 3 illustrates the different modes of learning. The majority (40 in each case) were either face-to-face or e-learning. This is followed by distance learning (31), and M-learning (17). Two were not sure and 6 selected ‘other’ with examples of:

- Blended learning (face to face + e-enhanced).
- Virtual learning environment.
- Workplace based.

Figure 3: Modes of learning

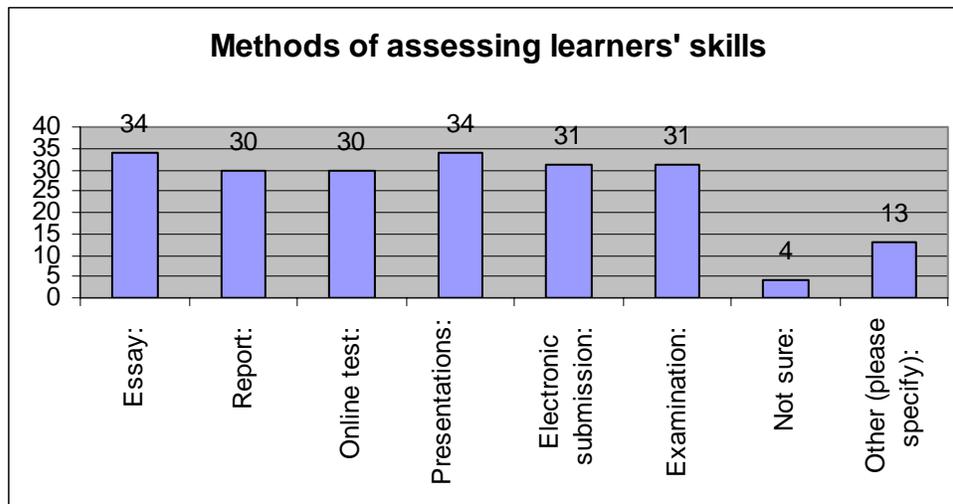


Respondents indicated a mix of methods to assess and develop learners’ skills (Figure 4). These include essays (34 respondents identified this as one of the methods they use), presentations (34), electronic submissions (31), examinations (31), and reports (30). Four respondents were not sure and 13 selected ‘other’ with examples of:

- Classroom Response Systems (Clickers)
- Direct observation, multi-source feedback, case study analysis

- Online forums, development of html pages, fieldwork, development of online wikis
- Oral exams for language students, performances for musical students, etc. The full range of assessment methods.
- Practical exams
- Practical lab work
- Practical, fieldwork, portfolio
- Video production

Figure 4: Assessing learners' skills



When asked whether learners find mobile technology particularly beneficial to their learning experience, the majority either agreed (21) or did not know (19). When asked if some learner find mobile technology difficult to use, 27 said they agreed with this and 7 strongly agreed, whilst only 10 said they did not know.

Focus group participants thought that, in general, mobile technology will be beneficial for learners and their learning experience, comments included:

I think anything that increases the opportunity for someone to learn, when they want to learn has to be good, whether they take advantage of that is another matter.

I think the e-learning is something that provides that kind of structure for students. If it is well designed it will have the largest catchments in terms of bringing in students to being inventive learners, there will always be some who can't but that is where you hit them, and that's where you make a difference from my experience.

Without a doubt, definitely with reliability but also the up to date-ness of the resources and the fact that they can see that their tutors are actually using it and keeping to up to date, other people are using it, I think if you have a stagnant e-learning resource they will tune out very quickly.

'For me it is less about the device and more about the mobility and the chance that we've got to offer students something in a very different way, as you say students who have childcare, work overnight in restaurant or whatever, can read stuff on their PDA, they can access traditional teaching methods that they just wouldn't be able to get and would not be able to do a course without that.'

Some participants had reservations about the benefits of mobile learning:

Mobile learning cannot, as far as I see it, provide and structure or provide a direction, even for an independent learner. It can provide a way to facilitate them to be independent learners but the structure of the e-learning when they access when they go mobile - do they go on to Facebook or do they go onto a virtual learning environment which allows them to contact their friends within the college but maybe then also access material.

'It is just another tool in the same way that a whiteboard or an interactive whiteboard or whatever is just another tool that will work for some students and some staff in some subject areas and it won't work for others. You can't make it fit, you can use a screwdriver to put a screw in but if you use a hammer you can maybe just about get it in, but its not a very good use of resources.'

The focus group participants also discussed the importance of using appropriate technologies:

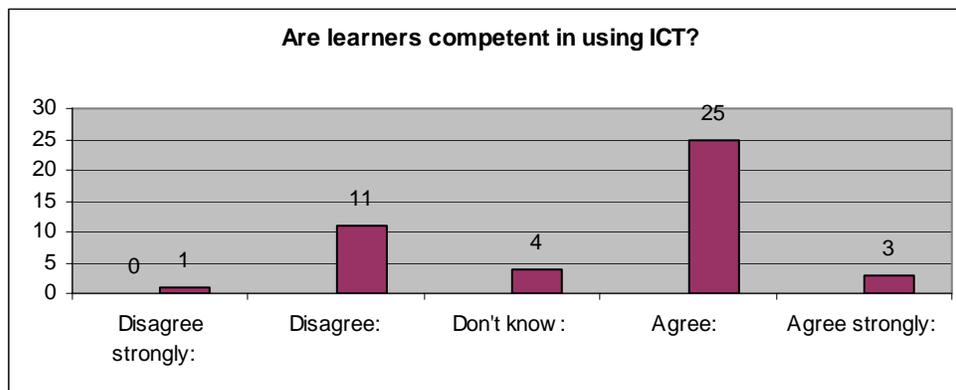
'I think one of the issues is appropriate use of that technology of course an amount of people want to use it because its there'.

'Its what the technology can offer and either it replaces what you do now in a more effective way or lets you do something that you can't do now'.

'Essentially the way people learn hasn't really changed since Socrates was alive they still learn in their own, whether its serialistic, holistic or whatever, however you want to brand the style or approach they have to learning, they are still learning that way. Now all that we have got to do is change our delivery methodologies to accommodate the way these students work and to accommodate the locations into which they are able to learn in.'

A slightly more mixed response was given when asked whether learners are competent in using ICT. Figure 5 illustrates this, with 25 agreeing with the statement, three strongly agreeing, 11 disagreeing, 1 disagreeing strongly and 1 did not know.

Figure 5: Learners' ICT Competence



The focus group participants discussed the common perception that students are competent using ICT:

'I think a lot of students haven't actually thought about it though, because in an ideal world what do you actually want. They haven't actually thought about what can help them in terms of m-learning because obviously it's quite a new phenomenon, I don't think they can see that connection yet, everybody talks about them being digital mainframes but they are not.'

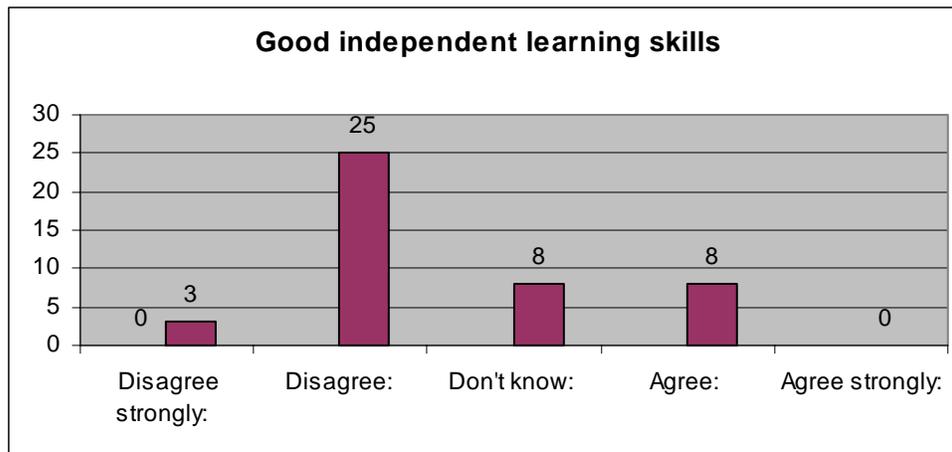
'I think they have too many types of devices, they don't know which the right one to use is. They probably all have access to desktops, laptops, possibly PDA's and other devices, but we don't know what is appropriate.'

'I don't think they actually understand themselves the possibilities that are there.'

'..... we assume that these students are coming here with all this technical ability to work web 2.0 technology and this is what they want. They want this, they want that, and it's not really the same thing. I have done some research with some students and they haven't actually understood what m-learning actually is.'

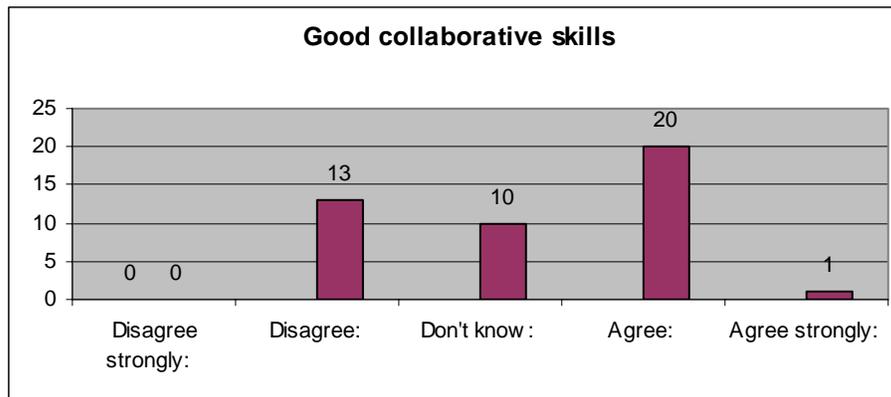
The majority of respondents (25) disagreed with the statement that learners have good independent learning skills, and 3 strongly disagreed with this. Eight respondents either agreed or did not know (see Figure 6).

Figure 6: Good independent learning skills



A mixed response was given to the statement that students have good collaborative skills, Figure 7 illustrates that 20 agreed with this statement and 1 agreed strongly, 13 disagreed and 10 did not know.

Figure 7: Good collaborative skills

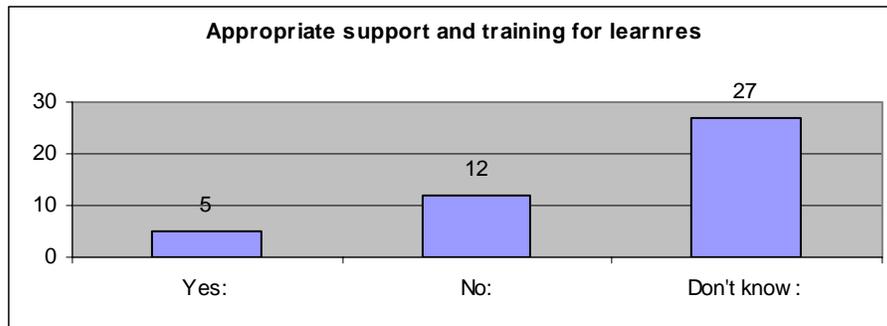


The survey went on to ask about support, training and guidance for learners. When asked whether appropriate support and training was given for learners, the majority of respondents said they didn't know (27). Twelve said no and only 5 said yes (see Figure 8). Comments included:

- Difficult to assess
- How much of this is known ? If we are releasing material via podcasts then we can provide assistance in how to use these on mobile devices, but for any informal learning completed via a mobile device, it is more likely to be self-learnt or asking peers.
- I think it is assumed that students will have access to these technologies and will therefore know how to use them.
- No training is given, on the basis that students are mostly familiar with how they work. In addition, at this stage, it is useful to see what can be achieved without explicit training
- On a campus university, there is always a better alternative to using mobile technologies.
- There is no formal process to measure this in my institution.

- This is patchy, I support my students, but I know there is little support on some other programmes.
- Myself and Learning Technologists provide support and training to students.
- Yet to support laptop users, but it is planned via a 'clinic'

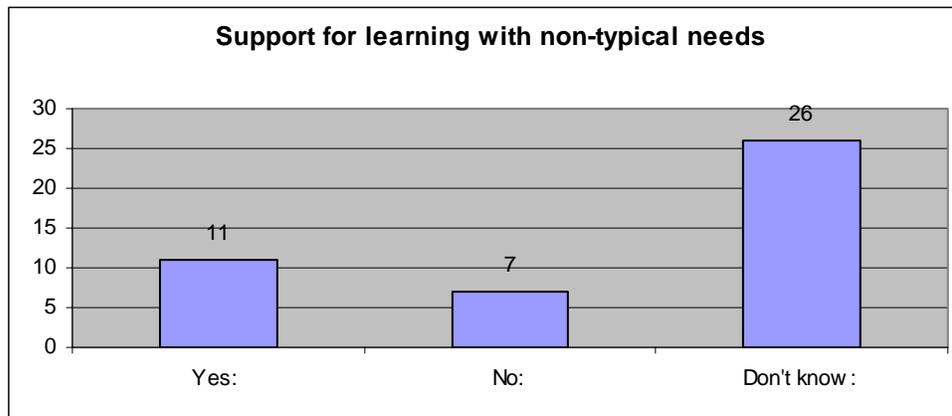
Figure 8: Training and support for learners



A similar response was given to the question about support for learning with non-typical needs. Twenty 26 did not know, 1 said yes and 7 no (see Figure 9). Comments included:

- Appropriate training and support will be essential (as will alternative delivery mechanisms).
- I have experience with sight impaired users, it works for them, I don't know about other non-typical needs
- I've only encountered dyslexic students in this context. Video use suited them anyway.
- Mobile devices and use of voice technologies can provide an alternative medium for learning content.
- There are issues around keyboard, trackwheel and other navigation which might be considered a non-typical need but there is a not a lot of public research available on this yet.
- No formal process in place, so unable to confirm.
- No real experience
- I provide 1 on 1 support for students that often returning to education and may not be IT literate.

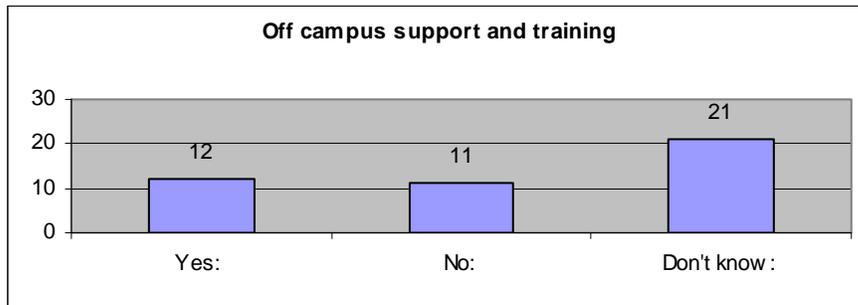
Figure 9: Support for non-typical needs



A more mixed response was given to the question about support and training for off-campus learners (see Figure 10), although the majority still did not know (21). Twelve said yes, this was provided and 11 said it was not. Comments included:

- As part of ALPS students use the technology whilst on placement in hospitals.
- They can call our help desk for support, email or use msn.
- We can remote control their devices, push updates, etc.
- We have comprehensive documentation on the web.
- I use discussion boards in the VLE to support students remotely on other internal projects.
- One or two 2hr sessions/year
- Most do not have an adequate phone.
- Support is given by text or calls.
- Staff can but unaware of any provision for students.
- They will find it for themselves if they think they need it.
- Through email / phone.

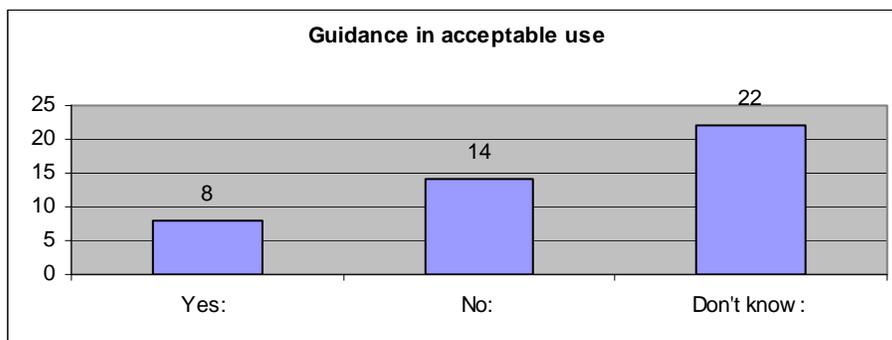
Figure 10: Off-campus support and training



Twenty-two respondents said they did not know if any guidance was given on acceptable use for m-learning (e.g. an m-learning Acceptable Use Policy), 8 said this was available and 14 said it was not (see Figure 11). Comments included:

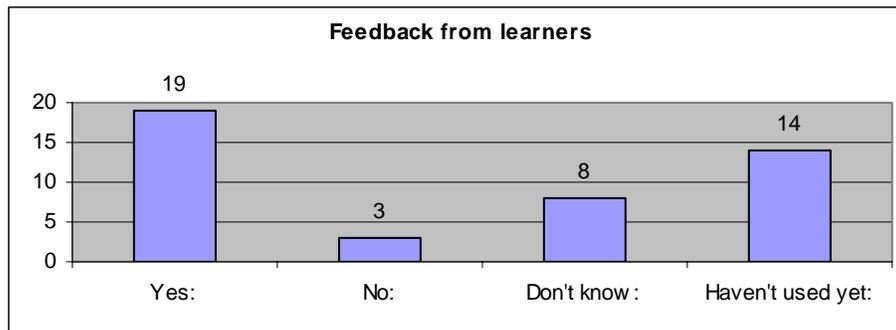
- As part of rollout of new VLE
- Carried out comprehensive evaluation in association with an educational researcher.
- Via the VLE and in Focus Groups
- We are piloting the use of lecture capture software.
- We have forums and question facilities etc.
- We run a blog and evaluate use at end of all courses
- Yes, but only when use is discovered and they liaise with the educational development unit

Figure 11: Guidance in acceptable use



A more positive response was given to the question about gathering feedback from learners. Nineteen said they did collect learner feedback, 3 did not, and 8 did not know. Fourteen said they had collected feedback but hadn't used it yet (see Figure 12).

Figure 12: Feedback from learners



Learning and Teaching

Survey respondents were asked whether they had received training and staff development in the following areas:

- Mobile learning.
- Pedagogical aspects of mobile learning.

Regarding mobile learning, 27 had not received any training, and 16 had. Comments included:

- Not requested any.
- A short session on how to use the smart phone.
- Attended BL and Molenet trainings at UH and LSC conference workshops
- Do you mean have I received as opposed to delivering ? No, entirely self-taught and self-funded conferences. e-learning courses I am expert in mobile development but always willing to learn more.
- I attended an ALT workshop recently, but that's about it

- I attended the First Annual M-Libraries conference at the Open University last year.
- I once went on a course that covered mlearning but the content was rather dated.
- I've had training on e-learning technologies, and how to create podcasts.
- not as yet, but once implemented, staff workshops will be held
- Only as part of independent study of a Masters degree
- Self taught (2)

Regarding pedagogical aspects of mobile learning, 33 had not received any training and 10 had. Comments included:

- One-day conference at the university of Bath
- In all my work I tend to partner with academics in a collaborative manner to ensure the correct skill sets.
- I'm one of those leading this development in my faculty.
- Not as yet, but once implemented, staff workshops will be held research
- This to me is the challenge.
- Via conferences, workshops and expert groups.

Focus group participants discussed staff training issues:

'..one of the comments we get from staff when we do pedagogical training is that "we want stability; we don't always want to be working like this where this has changed or that has change". It doesn't surprise me that staff are saying that I think it is a case of we don't know what we can do with them yet.'

'There's a big weakness in digital literacy, and across the board even the younger learners don't have the skills to use for digital learning they are digitally illiterate. Tutors need to have the time given to them to actually sit down and develop the skills and learn how that applies'

' I don't have time to think about what I'm doing, I just do it because I've got an hour before the lecture. We need to fundamentally think about how we work, how

staff are expected to work and supported, not just training but having to spend time trying to work stuff out.'

'... I think the tutor is often the key to the process, you know, the lynchpin. A lot of emphasis in the mobile learning development is focused entirely on the student; you know give the student the device. You look at the budget and there is no budget spend on training for the tutors which for me is just a recipe for disaster.'

'There is also, I believe, an inherent fear of a lot of tutors -who are a little older, shall we say, than the average- that the technology is beyond them. They do rely on people like myself to- they have the content to then come to me and say 'there it is, do something with it, make it available on the VLE'.

Participants were asked if they had an e-learning strategy, or a teaching and e-learning strategy which incorporates m-learning. Eighteen said Yes, 14 said No and 11 did not know. Comments included:

- All face to face learning is backed up with e-learning resources
- broadly speaking, yes....although not specifically named as m-learning.
- e-learning strategy currently in development
- I know that they have an e-learning strategy as the Moodle VLE was rolled out this year, and all courses have to have a 'Moodle site'.
- I have developed new forms of assessment in order to make use of many of the aspects of the VLE.
- It is so new within the organisation that I believe post Project m-learning will be incorporated into the e-learning strategy
- So far only the laptop part of the initiative has been implemented.
- Targets in relation to: flexible delivery, inclusivity, development of independent learners, employability the e-learning strategy is part of the overall university learning and teaching strategy
- The use of Virtual Learning Environments.

Participants were then asked which elements within their courses, modules or units of learning would benefit from the use of mobile technologies. Responses included:

- All courses can directly benefit from the use of mobile technology.
- It is an emancipatory technology for many learners with disabilities.
- All of the face to face learning could be backed up with mobile technologies although this lacks immediacy and feedback.
- Any useful knowledge: demonstration of skills, short "lectures", tutorial tasks...
Bedside teaching and off-site Consolidation of learning and Assessment. contact with students data collection
- Distribution of lecture materials, peer feedback and review, reflective thinking, assessment feedback
- Lectures, Attendance monitoring, admin (lectures moved, exam deadlines).
- I use it with students with specific short answer questions.
- Placements and field studies
- Pre and post workshop activities in respect of academic staff development courses student communication both for distance learners and blended learning students
- The students were all work based learners and able to take the mobile device into their workplace to capture events - photos, video and sound files.
- They were able to add these to existing portfolio or use them to share with peers during class contact time or just as reminders to aid them in reflecting on their practice.
- Too early to tell, it depends what students want and need, their context etc use of learning bytes use of GPS with geo-data handling initial teacher education on m-learning
- Use of learning technologies in PGCAP; aspects of assessment and feedback
- We are encouraging much wider use of blogs and wikis, in some of our undergraduate courses, and mobile devices evidently have some potential here, especially with our agricultural students

Participants were then asked about resources required (for example, access to existing resources, production of purpose-built resources). Responses included:

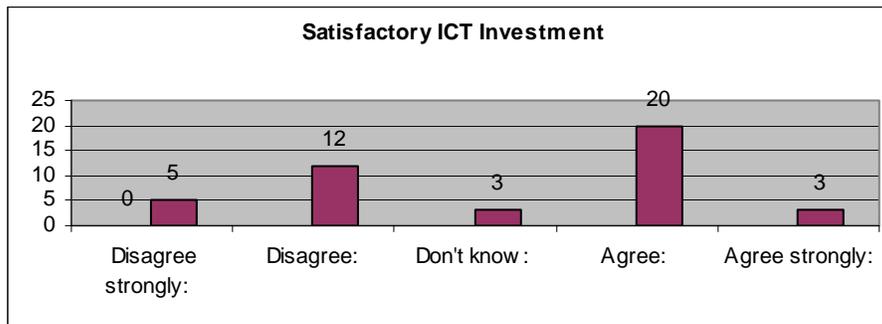
- A change in culture to accept them as valid within formalised education
- A couple of years ago I really wanted to assess the students through their creation of podcasts. The students would then download the podcasts and peer review. I was unable to do this as I could not get funding for the software and recording equipment for each student. I would also like to accept more online submissions of work. However, the only way to provide detailed feedback is to print off the submissions (inserting comments on MS Word is often not enough). The only way I can do this is with a notepad, but I do not have access to one.
- A phone paid for by institution. Some students do not have the funds to use mobile technology.
- Access to existing resources. Production of content.
- data output functionality to mobile device from VLE
- Decent funding to develop the next thing.
- Funding for equipment to loan to students. Special learning suites for small group sessions.
- Hardware to implement m-Learning and resources for training the implementers and users
- I think the biggest problem with m-learning is the fact that very few educational technology tools (e.g. VLE's) are designed for a small screen
- I use a Mac with quickTime pro, snapzPro (screen recording), iMovie, a graphics tablet (recent acquisition), garageband (audio editing), a USB headset, webcam (with background screen)
- I use low level kit ie cheap microphone and audacity. I use Mac's Garageband to assemble so access to a mac is necessary.
- In-house software development
- Materials. Learning technologist(s)/ developers to produce suitable content. Needs analysis of provision.
- Most resources in place. However, there are institutional ICT policy issues with regards to people plugging in a mobile device to their work computer - these are being looked at as a result of the project.
- Production of purpose-built resources
- production of purpose-built resources

- SMS texting - VLE - quiz software e.g moodle
- Software mainly
- staff training
- Technical support and time to research existing resources and to develop bespoke materials
- that's the HEIs' responsibility
- Time & Technical expertise. The key is to develop systems that work on any device that a student may have.
- training, development time

Respondents were asked to rank their levels of agreement with a number of statements. Ranking ranged from 'Agree strongly' to 'Disagree strongly'.

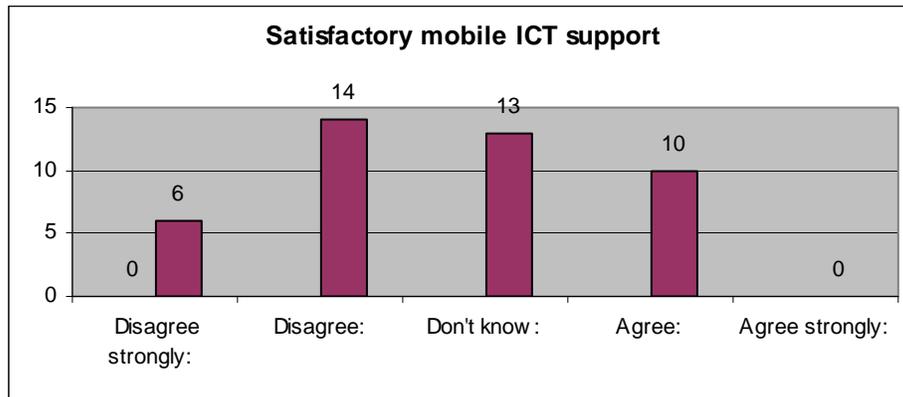
To the statement 'ICT investment in my organisation is satisfactory', 20 agreed, and 3 agreed strongly. Twelve disagreed and 5 disagreed strongly. Three did not know (see Figure 13)

Figure 13: ICT Investment



To the statement 'Investment in my organisation in support for mobile ICT is satisfactory', 14 disagreed, and 6 disagreed strongly. Thirteen did not know. Ten agreed (see Figure 14).

Figure 14: Mobile ICT support



Focus group participants discussed investment in ICT within their institutions. Comments included:

'I will say there is very little investment in mobile learning, apart from podcasts which are getting off the ground without much investment.'

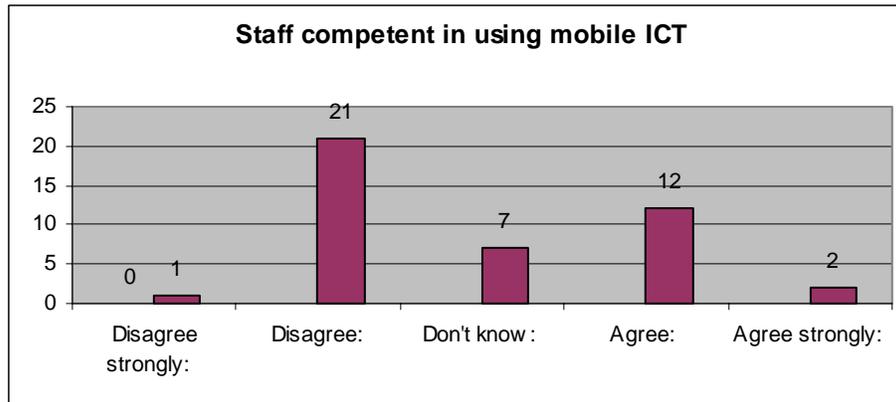
'There is a huge tension that institutional IT services are very much being focused on a command and control model; we will operate the systems that we want to operate you will use our email our web browser you will use our operating system you know whatever. There is a difference between what universities think they have to give students and what students actually want.'

'Ironically, in school education these things will take off because schools have a lot of autonomy over what they can do and can actually go out and spend £30-40,000 without anybody being involved in their budget. In universities we just don't have that kind of power.'

'One of things that would be great to see in IT-spend go towards investing in systems that are going to be really difficult to change, big monolithic systems which are really difficult to change and adapt to the changing technological circumstances is probably unwise'

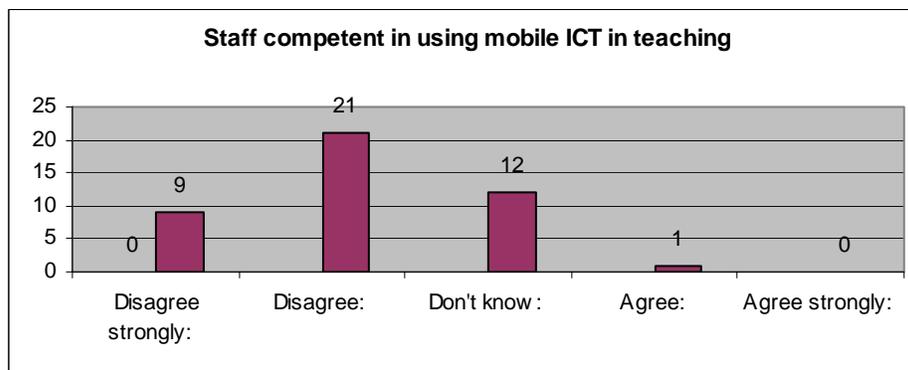
To the statement 'Teaching staff in my organisation are competent to use ICT in teaching', 21 disagreed and 1 strongly disagreed. Twelve agreed, and 2 agreed strongly. Seven did not know (see Figure 15).

Figure 15: Staff competence in mobile ICT



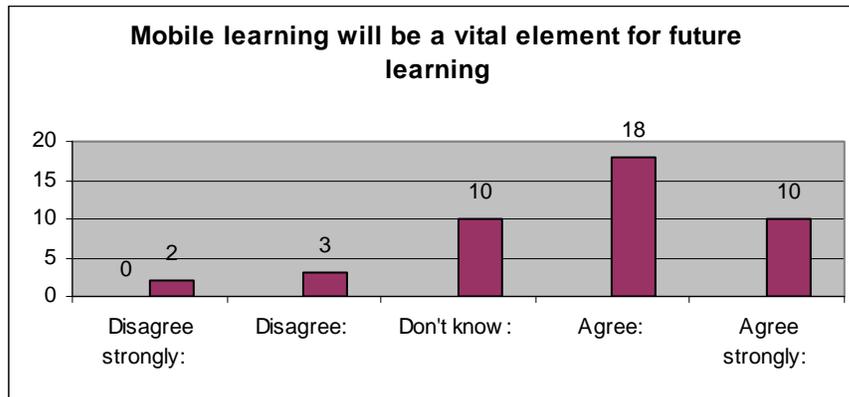
To the statement 'Teaching staff in my organisation are competent to use m- learning in teaching', 21 disagreed, and 9 disagreed strongly. Twelve did not know. One agreed (see Figure 16).

Figure 16: Competence of mobile ICT in teaching



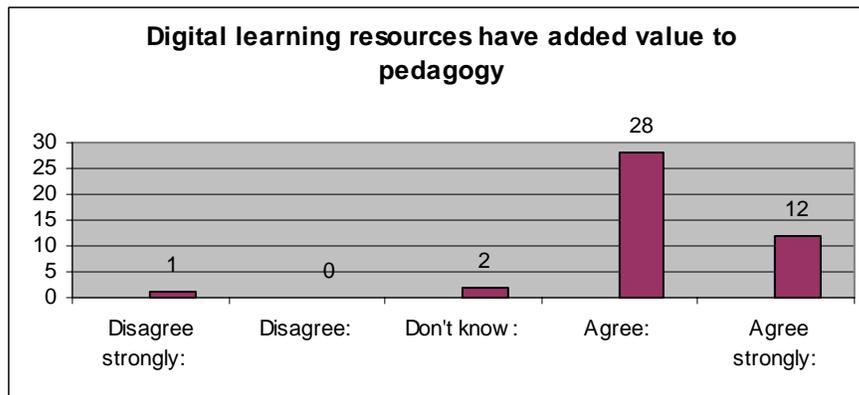
To the statement 'The use of mobile learning will be a vital element for student learning in the future', 18 agreed, and 10 agreed strongly. Ten did not know. Three disagreed and 2 disagreed strongly (see Figure 17).

Figure 17: Future of mobile learning



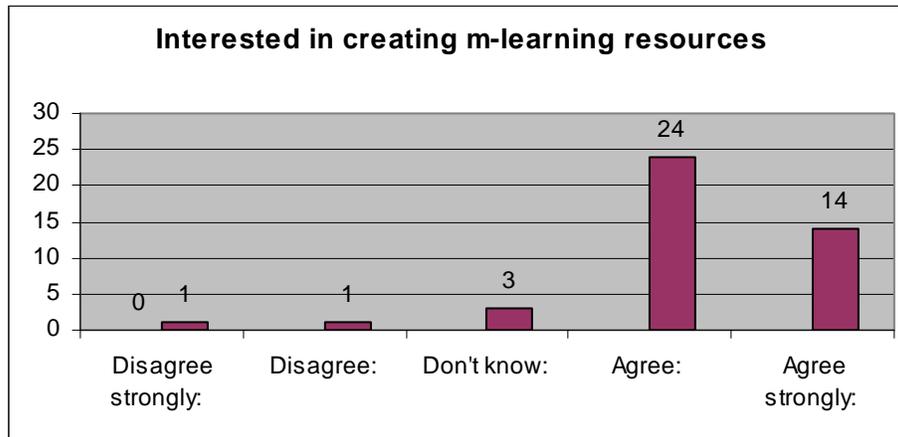
To the statement 'I consider the use of digital learning resources to have important added value in our pedagogy', 28 agreed, and twelve agreed strongly. Two did not know and 1 disagreed strongly (see Figure 18).

Figure 18: Digital learning resources and pedagogy



To the statement 'I am interested in creating m-learning resources or to adapt existing e-learning resources', 24 agreed, and 14 agreed strongly. Three did not know. One disagreed, and 1 disagreed strongly (see Figure 19).

Figure 19: Creation of m-learning resources



Respondents were then asked whether opportunities at work exist for them to become technically proficient in resource creation for mobile devices. Nineteen said Yes, 15 said No, and 9 did not know. Comments included:

- Haven't explored this area yet
- I have to teach myself, but it's part of my job responsibility
- I run the limited staff development on podcasting
- I've had one two-hour session on how to create a podcast, and one session on how to use captivate (which is not much use for m-learning considering the file size!)
- It's part of my job. I use a variety of software for this. The biggest constraint is workload.
- Not enough time allowed on timetable for course development.
- Not yet - as this is such a new area, I'm sure opportunities will be developed further down the line.
- Possibly. However the priority as I see it is to show the benefits of e-learning....I'm still ploughing away at that one. I see m-learning as a subset of e-learning.....it's something time permitting i need to be aware of and involved in.
- Very little support given by work. Insufficient time to work out and develop resources. Support given on an ad-hoc basis.
- We have a team of very competent E-Learning staff who deliver training.
- Yes but only in the context of resource development for better platforms.

- Yes particularly in respect of multimedia and video streaming of resources to mobiles

Survey respondents were then asked if opportunities at work exist for them to become effective at embedding m-learning into practice. Twenty-one said Yes, 15 said No and 7 did not know. Comments included:

- A priority of ALPS is to have the project embedded within each HEI by 2010. I see part of the embedding process to be rolling out to all areas of the University.
- Appropriate mechanisms will be provided
- If you can identify the opportunity and adjust the methods of teaching and learning and think of new ways to do m-learning.
- We have to create these ourselves.
- Yes as another way of providing academic staff development in blended learning contexts.
- Yes but I have higher priorities
- Yes but I have to engineer them myself - perhaps better to say there are few obstacles, rather than positive opportunities.

When asked if opportunities exist for them to disseminate your skills to others, 36 respondents said Yes, 5 said No and 2 did not know. Comments included:

- At staff training interventions on a regular basis.
- Cascade collaborative exercises
- Communities of practice; L& T conference
- I run staff development sessions.
- Informal and formal sessions are advertised
- Local workshops and national participation
- Opportunities exist at department, faculty and institution level to present work.
- Sharing best practice informally and formally
- The Library is active in giving presentations at internal conferences, and regularly contributes to the university's Continuing Professional Development programme.

- Through bulletins, Moodle site, College Management Team meetings, Away Days etc.
- We have internal learning technologies networks, could run sessions and develop guidance and training if applicable.
- We provide training to staff. I run internal mailing list, produces workshops and presentations, etc.
- Yes as part of CeLT it is a mandate to offer staff development in all aspects of learning and Teaching development and new technologies for education.

Respondents were asked about the types of activity they would want to use mobile devices for. Comments included:

- access to library online resources
- Alerts, just in time exam practice, enhanced student - tutor communication
- Anything to support learning, teaching and assessment and enhancing the student experience. E.g. feedback
- Backup existing delivery systems, cope with learners with difficulties, decrease need for transport and face to face contact
- Capturing evidence in the workplace in particular for construction students, hairdressing students and hospitality.
- Collaboration Revision Assessment
- data gathering reflective sharing resources - just-in-time
- Demonstrating possibilities of collaboration and reinforcing learning
- Distance Learning
- Enhancement materials for performance courses. Supporting the development of individuals reflective capacities
- Extension of learning activity outside of face to face workshops and seminars
- Feedback possibly, delivery of some content to students
- Student generated content
- Field work, projects
- For general students, the delivery of important announcements, timetables, reading lists. It could also be used for innovative teaching methods. If applied in

- work placements could be used for a range of purposes, e.g. to provide evidence of abilities.
- Information pushing services - alerts about new information resources. New ways of users to communicate with the library, e.g. texting details of new books for purchase.
 - information updates, results, reminders re assignments, appointments accessing learning resources during a 10 minute gap in work activities, researching evidence bases at work
 - Providing feedback
 - Quiz consolidation of knowledge
 - Reflection i.e. portfolio Self assessment - Formative Long term summative assessment. Support for learning, e.g. lecture schedules, exam timetables & locations. Support for disabilities, e.g. subscription to lecture RSS feeds Social networking. Evidence collecting. Possibilities are endless.
 - reinforcement of learning, assist with subject immersion, increase the flexibility of learning opportunities for students - so, potentially, improving achievement.

When asked what developments in m-learning would make a difference to their learners, respondents suggested some of the following:

- Access to wireless networks
- Any developments at all, currently we don't use mobile technologies in teaching
- Cheaper texts, and better support for video and MMS
- Confidence, Creativity in the classroom, A can do approach.
- Easy Access to laptops within MMU. I haven't got one and ICTS have no policy on this
- Free service to the student
- GPS
- Improved input and output devices
- Improving screen reading capacity; applications that render objects suitable for reading on a PDA etc.
- Make iPods available to all students

- Not sure - it would depend on all students having access to the same mobile technologies, and the ability to afford to use them.
- Reduced cost of use faster network speeds reliable networks available everywhere devices - More iPod(PMP)web friendly devices.
- Software that would be easily accessible and usable on any phone
- Staff availability out of normal work hours
- Training, accessibility to devices
- Ubiquitous Network Access and access to high function devices to affordably own.
- VLEs like WebCT being accessible from mobile devices would be a start!!!

When asked about the support systems needed to be set up in order to use m-learning, respondents suggested some of the following:

- A mobile services platform for device control. Central help desk with the ability to remote control. Specialised learning technologist. Teaching fellow with remit to embed academic use.
- Applications development, infrastructure development, customer support, pedagogical support
- As for 28, infrastructure / connectivity essential.
- Bluetooth broadcasting infrastructure; training resources for different phone types.
- Discussion around pedagogy and practical support for creating mlearning artifacts
- Face-to-face support for those uncomfortable with the new technology would be the most important - this kind of defeats the object, it could be argued, but I think we should recognise that for some people, m-learning will not be at all a satisfactory way of learning. In looking to address all the different learning styles amongst learners, we have to remember that one of those learning styles is the traditional "heads down with the books" style, and for those learner m-learning might be more a hindrance than a help.
- Faculty development!

- I think tutors need to be better supported and given the chance to teach students how to apply the devices to learning. So training primarily.
- Information on what technologies are available. Information on how they can enhance the student learning experience.
- More engagement in eLearning in general first
- More exemplars of good practice
- More intensive staff development and remission for staff to develop their skills to incorporate m-learning as part of their Teaching and Learning "Tool Kit"
- Robust technical support. Programme of staff development aimed specifically at introducing m-learning.
- Staff access to wireless laptops student access to same and personal classroom voting devices. A standardised MMU policy is required.
- Staff and student training, widespread use of camtasia/snapzPro, availability of hardware, and support infrastructure (e.g. chargers for mobile devices, repair services, upgrade routes planned.....
- staff student training
- Supplementing skills on IT helpdesk. Support for device specification and selection. Staff support for appropriate activity design.
- Synchronising with PC's. Trouble shooters. For students and staff.
- Technical Pedagogical Strategic
- technical advice on applications pooling of experience among users
- Technical support and user help-desk management
- Training for students and staff is the main thing, providing a number of ways for people to contact local helpdesks or academics for one-to-one help is necessary too.

Technologies and infrastructure

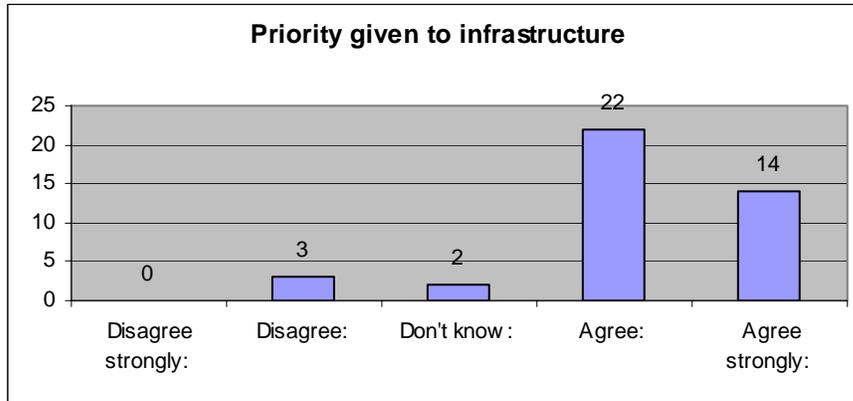
Survey respondents were asked to rank their levels of agreement to the extent to which they agreed or disagreed with the following statement: 'In the next 10 years your institution should be giving priority to':

- Infrastructure.
- Staff training in the use of mobile technologies.

- Development of new educational resources for use with mobile technologies.

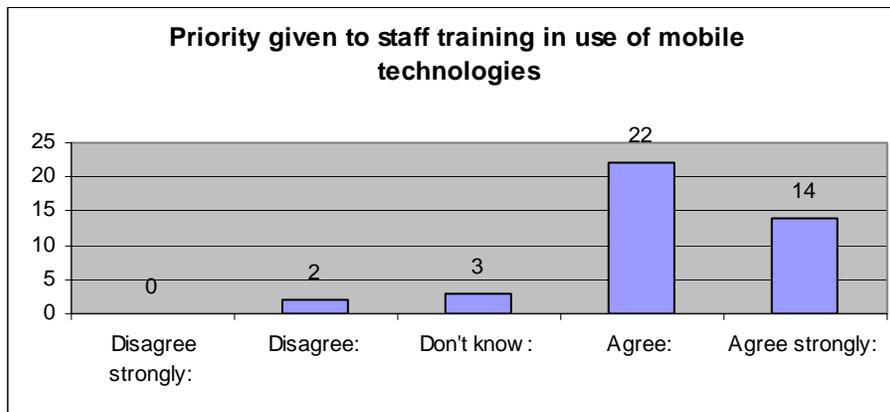
To the statement about Infrastructure, 22 agreed, and 14 agreed strongly. Three disagreed and did not know (see Figure 20).

Figure 20: Infrastructure



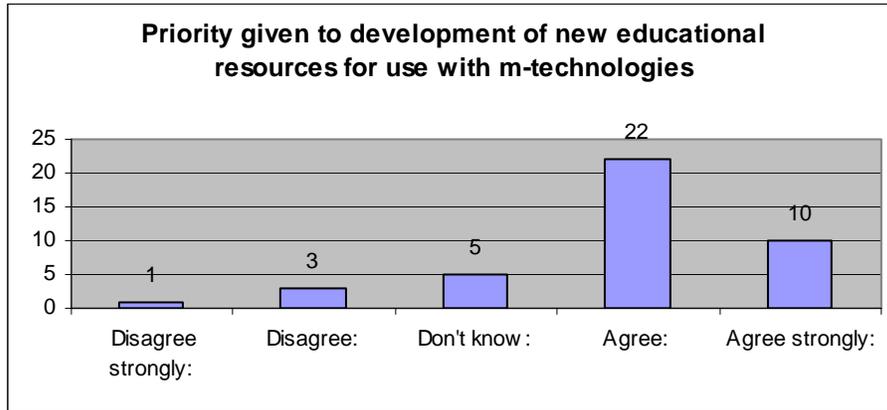
To the statement about staff training in the use of mobile technologies, 22 agreed, 14 agreed strongly. Two disagreed and 3 did not know (see Figure 21).

Figure 21: Staff training



To the statement about development of new educational resources for use with mobile technologies, 22 agreed, 10 agreed strongly. Three disagreed, and 1 disagreed strongly. Five did not know (see Figure 22).

Figure 22: Educational resources



Interviews with educators to establish current practice and future expectations

Interviews were of two formats: face-to-face and over the telephone, all being audio-recorded. The seven face-to-face interviews and telephone interview number 8 were in considerable depth: the responses for those are reported under broad headings and as near verbatim as possible. The remaining telephone interviews were briefer and are reported using the original interview questionnaire.

Mike Sharples

Profile

Mike Sharples is Professor of Learning Sciences and Director of the Learning Sciences Research Institute at the University of Nottingham. He also works with other Universities, e.g. The Open University, and with Becta and JISC, and companies such as Sharp. Mike has an international reputation for research in mobile learning and the design of learning technologies.

Involvement in m-Learning

He leads research projects across all sectors and all age ranges, was a member of the European 5th Framework project MOBILearn, is President of the International Association for Mobile Learning and inaugurated the MLEARN international conference series.

The attitude of the pupils/students to m-learning

"Taking university students, I don't think they would identify the term m-learning. So they learn, and in that use a variety of mobile technology. A key thing we found so far is that they don't distinguish between using the technology for socialising and using it for learning. For example in group work with other students they may use their mobile phones for co-ordinating meetings with other students, and if in discussion some topics come up they need to know more about they might use their mobile phone to Google it, so learning for those students integrates pretty seamlessly into their use of mobile devices, so I don't think they would identify m-learning as being a separate activity. I think what they would say is that at university they want to learn in a more rich way and that their mobile helps their work. To them, it is just a natural part of their life. I don't think they identify the technology as something different any more than they would identify a pen you hold as a technology."

Training and support

"Not enough attention is paid to the training of teachers. One of the problems now is there is huge gap between what the students are already doing and what institutions are able to provide for the skills needed by staff to be able to support them. It is a three-way

thing: staff need to learn from students as to what the needs are, the university needs to support staff in making more appropriate use of mobile technologies and providing training for them, and staff need to lobby the university in terms of how new technologies can enrich the learning. It is very much this three-way thing, but it has to start with the student need and understanding that: the biggest problem is that staff don't really understand what the student needs and opportunities are.

The real gap is in the technology as staff don't understand how students are using the technology in a productive way already to support their learning. In a project with secondary schools looking at students' web 2.0 activities, students were asked if they used their mobile phones for learning in the class at school, and over 30% of them said 'yes' - despite mobile phones being banned at all those schools in the survey! They were using their mobiles not just for socialising but to support their learning, so there is a huge gap, even in school, between what students actually do and what the staff think they do and are able to support.

So, there is real mis-understanding of what students are doing with their mobile technologies. In terms of pedagogy it's a narrowing of the gap: there are certain teaching and learning requirements for students at all levels and students need to understand the pedagogy of HE. Also, students are engaging in rich learning outside the university and it's not just a matter of trying to merge those two, and that's what's really difficult. It's not just a matter of taking traditional university pedagogy like podcasts and so on and delivering lectures in new ways, its about new forms of learning and social constructivist learning that goes on outside the lecture halls and the reflective academic learning that goes on inside."

The importance of m-Learning in the future

"In the broader sense it has to be important for the future because in HE the students are already coming equipped with a variety of mobile devices which they use to support their learning. That's just a given, they are already doing this: over 50% of students have laptops, almost all of them have mobile phones and increasingly they're using them for their learning, so yes, mobile learning has to be important. I think the challenge for HE is two things: one is how can these technologies be integrated in a productive way, whether it be in large lecture halls to provide student feedback, or at the other end of the scale to support quite intimate personalised learning. The second challenge is how do universities need to change not just to support new technologies but to integrate the learning that goes on outside - collaborative, college-enabled social learning that goes on outside the classroom with the more reflective academic learning that goes on inside. Both are very valuable, albeit at the moment far too separated.

You can interpret m-learning in two ways: one the learning that already happens and is already widespread. Students are already using mobile devices and a variety of technologies in ingenious ways whether or not we want it to happen. The question is how can HE and schools make best use of that. I think it [mobile learning] will become widespread for two reasons: one is pure economics that schools can't go on buying under-powered desktop PC's and filling rooms with them when students are already coming equipped with a more powerful machine in their schoolbag. And there's a pedagogy aspect which is that we've got 30 or 40 years research in effective learning now and we know that effective learning comes from peer-learning, from collaboration, engagement with the world, from conversation, from active enquiry, and your not going

to do that inside a classroom with a traditional teacher. There is a need for reflective academic learning, but it's got to be complimented by more enquiry case-based active learning. So I think it is going to become widespread just because the pedagogy needs it to become so to equip people for 21st century work and survival: they have to learn the skills of networking, social interaction, collaboration and so on. Eventually formal universities will start to afford it. It's happening: there's some really innovative projects in schools around social learning, and using mobile devices and that will gradually start to percolate out. Everything goes slower than you expect, especially in universities. Universities and schools are very resilient to change because they have all these structures, particularly accreditation structures, curriculum structures, but it will happen at the edges: you'll get universities texting updates to students and gradually that will percolate into the teaching and learning. Students already demand access to the network from their bedrooms, wireless access, SMS notifications of timetable changes, etc. There will be other changes coming from innovative teaching practice that gradually percolates through but that takes time. I think the UK's better placed than many other places to do that. We might think things are moving slowly in the UK but we are ahead of the field, so I'm pretty optimistic, though it probably won't be in 2-3 years but in 5-10 years. Universities will recognise that they can gain competitive advantage by the providing for the use of mobiles, as Wolverhampton and Coventry are already doing."

End

Mark Prensky

Profile and Involvement in m-Learning

Marc Prensky is an internationally acclaimed speaker, writer, consultant, and designer in the critical areas of education and learning. He is the author of *Digital Game-Based Learning* and coined the terms "digital native" and "digital immigrant". Marc describes his work as:

"I work for myself and for people who want to hear my opinions and thoughts. I express them in writing through books and articles, in talks and in doing research on products to help people learn difficult things or new things in new ways and I try to stay on the edge of the unexpected and the difficult rather than the expected and easy.

I'm an evangelist for young people and for learning and for helping them achieve their greatest potential: that's really my goal. Technology serves that purpose in the sense that, once they get to do their education by using technology, their ability to reach their potential and personal goals expand exponentially."

The attitude of the pupils/students to m-learning

"I think that the younger they are the more they think this a normal way to do things. We were in Worcestershire last week [i.e. end October 2008] and we had a panel of kids and it was the ten and eleven year olds who were most looking for the use of the mobiles in their learning.

I talk about the digital natives versus digital immigrants, and the reason is that when you are given these technologies and surrounded by them from birth (my son has had devices of one kind or another pretty much since he was an infant) the attitudes and the facility with these things becomes very different and people see them as friends and not foes, they see them as uses and not tools and they expect that everything they have in their life will interact with them in some way.

I think that there's the old statement that "technology is only technology if it was invented after you were born". So the people that are born to it just expect that this is part of their lives, so it would be, as one kid put it in Japan: - "if you take away my mobile it's like ripping out part of my brain.": these are extensions of their life that are normal just as clothing is normal."

Training and support

"I have a particular point of view on this: there are those that say that educators should learn all these tools and that's what professional development should be all about. I differ: I think that people who want to use these tools should absolutely use them to the maximum, but the people who really need to use them are the young people, and so the role of the teacher, the educator, is to learn how to teach differently, to learn how to give the youngsters the opportunity to solve problems and answer questions and find results using the tools - the same questions they would be lecturing about normally, but to do it

in new ways and to understand what some of the capabilities of these tools are, so that they can direct the kids to use the proper tool and they can judge whether the student is using it in a good way, a rigorous way, a quality way."

The importance of m-Learning in the future

"M-learning will be very important. There have been some very quick tipping points and one of the ones I love to point out is when the telephone answering machine first came out it was considered rude to have an answering machine. In only a couple of years it was considered rude not to have an answering machine, and I think some more things will happen in schools. I think that once some acceptable solutions are found to issues like privacy, like pornography, like disruption, like somebody doing something unacceptable and punishing them without punishing everybody, I think as we find solutions to those and as we spread them around - and one of our other great problems is sharing things that do work - once we start to do that better I think these things will move very quickly.

It's going to happen like the way a disease sometimes spreads: we're seeing work pop up in places where people are less afraid or they've come up with solutions. They start out with individuals, then it will become the school, the district, the councils, then the countries where it's happening at different rates, then parts of the world. Sometimes my observation is that things are happening faster in some of the smaller counties, because they have some control and they've been thinking about this. I've just heard about New Zealand, for example, that has put out a very new curriculum, a very new way of learning, and they have sort of got the message, but what they're doing is very top-down so they're going to meet resistance from the teachers and from the bottom up, and unless you balance top-down and bottom-up you really have a problem. The teaching is in the middle, so some places do that more quickly than others, and I think that as the teaching profession moves towards this new paradigm of kids learning on their own - which is the place we all know we want to go, I think there is consensus, but how to get there, there is not - then we will start seeing more quick movement. The other half of that of course is what we teach, and because we are so wedded to a curriculum of the past we are also wedded to the means of teaching that curriculum and it's sometimes harder to teach old stuff in new ways than it is to teach new stuff in new ways. We might see it first in IT and things like that.

The UK varies. They've some extraordinarily forward-thinking ideas in the UK - we've just heard what O2 is doing [ref Dave Whyley's Learning2Go project] and there's some very advanced things there. I recently saw very young kids in Middlesbrough doing green-screen video. There are certainly pockets, and there's the Mobi network [.mobi - a top-level internet domain] that's coming out - so I certainly think that at certain levels in the UK there's probably more being done than in some other places, but again it's like that disease breaking out: there are pockets of it but there are pockets where there isn't anything happening."

End

John Traxler

Profile and Involvement in m-Learning

John Traxler is Reader in Mobile Technology for e-Learning and director of The Learning Lab at the University of Wolverhampton. They work on externally funded projects around educational use of mobile technologies for innovative education and to further the aim of universal opportunity and access. Some of that work is in the UK, maybe with European partners, and some is in Southern Africa and South Asia. He says:- "I seldom come into contact with pupils: maybe trainee teachers, maybe - in the sense we are learning from each other - maybe I have a particular input that puts people in the position of learning from what I'm saying. The objective is to influence the people who train the teachers so that practically-orientated people are encouraged to develop ideas in mobile learning." He has done work, for example, in Kenya with ministry officials and farmers. John has co-written a guide to mobile learning in developing countries and is co-editor of the definitive book on mobile learning: *Mobile Learning: A Handbook for Educators and Trainers*.

The attitude of the pupils/students to m-learning

"I am very conscious and worried about these binary devices and therefore worry about one that is portrayed as a digital thing, because the technology we are talking about is diverse and the way they get adopted and adapted is a function of a sub-culture and different sub-cultures irrespective of their age: it might be something to do with their ethnicity, it might be something completely different. I think it is a very complicated patchwork, people using all different kinds of devices within different sub-cultures and communities for particular ends and aims which may not even be the ones they were developed and marketed for.

I'm probably preaching to the converted in many respects and I suppose my ambition would be to refine the converted. I do stuff in other countries where it is not always the case, I go to North America, which is preaching to the un-converted a lot of the time. They are saying 'what's the point' because their infrastructure and their educational traditions don't make it a no-brainer, whereas in Africa it is a no-brainer because of obvious infrastructure problems and a different teaching tradition. So once again it is a real patchwork."

Training and support

"This wouldn't be first hand evidence but we are about to do an evaluation for the TDA [training and development agency for schools] on ICT training within initial teacher training. Putting the question on it's head, and maybe saying the deployment of these technologies is fitted to the training rather than the training being fitted to the deployment, because I think there is clearly a comfort zone and it's really quite difficult getting beyond that comfort zone and part of that comfort zone is defined by the training. That comfort zone is partly defined by the way the kit - hardware - especially is procured and people trying to use it and I think we have an expectation that a school, university or college provide the kit and deploys it and it's uniform throughout your class and therefore that's the comfort zone defined for the teachers, and therefore that's what

we need to train them on. I'm not very happy with it as a model, but that's what happens."

The importance of m-Learning in the future

"M-learning will be important in the future, but maybe not in the way some think it is. In terms of specifics, I was writing a few things for BECTA recently for what they are calling 'learner devices', which is the remark made by Bill Bramhall about technology interfacing with your technology. I think the point he is making is that our society, our children, our learners, is awash with gadgets that they have paid for, that they own, that they choose, that expresses the things they want to do, the people they are, their affiliations, their values. There is a big disjunction, a chasm; inside the schools you have got the ones chosen by the schools that don't express anyone's individuality. I worry that mobile learning communities, to some extent the educationalists and the technologists talking to each other and actually not worrying enough about the ubiquity, universality, diversity and transience of the devices in the outside world and is hoping for the kind of stability that isn't there but that schools, universities and colleges still try to impose based on a model of providing I.C.T when it was desk tops. They're still thinking they've got a problem because they need to be providing ICT when it is mobiles, wondering how they can understand it, how they can afford it, how they are going to train for it. On the other side of the chasm, people who buy that stuff, choose and use that stuff, obviously know how to use it and they are using it in the way they want to.

So pointing out that chasm between what is actually happening in the real world and all the different bits of the real world, and what is happening in the institutions, I think the mobile learning community to some extent has taken its eye off the bigger ball, as it were, outside. So m-learning is as important as we think it is but in rather different ways.

If we find a way of engaging and exploiting with the stuff all of our students own and use, m-learning could become widespread tomorrow. If we don't we could be just going round the cycle of we provide thirty PDA's for a project and we find out it is not sustainable so we find some more money to do a different project with different PDA's and that's not sustainable either. So the worst case would be a recent FE programme putting six million or four million pounds in successive years into hardware provision which I think just backs you into a corner. That just proves if you keep providing six million pounds per annum you can roll out mobile learning in colleges, but you can't afford six million pounds per annum so those are the kind of constraints. So either we use what is out there amongst our learners or we break our backs trying to fund on-going provision for a technology that isn't the same as buying lots of boxes of PCs.

We have moved on from a definition of mobile learning where it used to be around the technology which I think is a very flawed definition. Learning using laptops or PDAs or i-Phones, etc we are used to defining it in those terms. It counts as m-learning if it's using that technology and I hope - I would certainly be trying to push - the looking at a model of learning around the more mobile society where everybody has this stuff and it is part of the way which society is involved with the lifestyles that are evolving with them. I'm not saying the technology is pushing society to move in this particular direction or society is pulling technology along with it. There are lots of new technology that are personal, connected and wireless, and the way we are is changing as a consequence. I think we are being quite non-conformist and we started very cautiously and said well it's just a bit more gadgetry and the same curriculum, or it's a slightly enhanced curriculum

and a few gadgets. If you look with a slightly broader perspective you actually see that's it is changing all sorts of aspects of our community - behaviour, discourse, ethics, everything.

If we are still looking for a definition of mobile learning it would be the learning that is best aligned to a society that is transformed by mobility."

End

Dave Whyley

Profile

Dave Whyley works for Wolverhampton E-Services, which is part of the Local Authority (LA) support system. They support learning technologies in all of their schools, of which they have about 120, with 45,000 learners. Dave was a school headmaster until about six or seven years ago and has been working across the schools since.

Involvement in m-Learning

"Whilst still a headmaster, working with the LA, I started a mobile learning project called 'Learning 2 Go' with year six junior school children using some fourteen devices. Then secondary schools were taken onboard and later key stage one (age 5-6) pupils, and latterly A level and A/s level students. Recently students on work-based learning placements, doing the new diplomas, have been included.

There have been about 4000 learners over a period of four or five years that have had devices, there currently (2008/9) being about 2000-2500 learners using them from the age of six up to eighteen. In Wolverhampton, the LA's view of mobile learning is that of trying to give the pupils a digital version of their school bag, to carry round with them all the digital tools they would need to assist them in their learning, not just to receive and consume but to be creative and collaborate.

Our latest initiative is in a secondary school and there are 350 devices in that school and all the staff in that school are involved so you are up to about fifty or sixty members of staff but across the whole project, usually in a primary school it will be the lead teacher in the class plus the class room support assistant. I'm guessing in total with both secondary and primary we are looking at a cohort of about sixty to seventy or maybe eighty teachers. It does vary, some schools, will have change in leadership, not the same priority, they will drop off, others will get excited by it, they will come on, it's an involving situation. It's a substantial project; we will be one the biggest in Europe.

There are no schools that have flatly refused the project. All of these innovation projects go through different phases. The first phase you have proof of concept. In order to prove the concept we used some innovation funding for three or four class sets and we identified the schools which met the criteria in terms of their E-maturity so we knew we were putting it into fertile ground, we knew the teacher would be good and we would get our proof of concept underway.

It has involved from project status through to a voluntary activity, to an activity that we have included and costed into our E-learner development package. Now we have an opportunity, with Building Schools for the Future (BSF) funding, to take all the work from the past four or five years forward to try to scale up to get enough expertise and enough infrastructures and support and enough critical mass of understanding to be able to deliver that when the money comes through. In our authority we are going to have £30million to spend, just on the high schools. Not all of that would be one-to-one, some of it's the infrastructures, white boards and the like, but a large proportion is to be in increasing pupil access."

The attitude of the pupils/students to m-learning

"Some of the pupils do find it difficult. I think what we tried to do was, in order to get some understanding and actually make this work, you can't go to the philosophical situation that some experts describe, where you just want everyone to bring in their own phone. For one the school isn't going to allow that and secondly no teacher could start doing the deep, complex learning, that we want, with multiple operating systems and devices. We were adamant it should be profound learning that takes place, not just consumption of i-tunes, etc.

What we have done is first focused on the same device and the same Operating System (OS) so that we can build up a package of content, software, support, CPD, pedagogical examples around that, and then just recently we have gone away from one device but stuck to the same OS. Schools are choosing a device according to cost and functionality against a matrix of what that device can achieve in terms of learning. So we have a basic sub-set of what we want the device to do and it's up to the school now to choose. If you think purely technically, then we can achieve the same things with different manufacturer's devices, but, whether that will be the case in practice has yet to be seen. In order to scale up, first of all you have to identify the scale of the issue, so what we have assumed is that every key stage three or four learner will have a device, every key stage two learner will have a device and that takes us up to 18000 learners. We are probably the biggest project in Europe with about 2500 at the moment, so it is a massive upscale, but technology is coming into place which will enable us to do it. So by the end of this year (2008/9), all of our primary aged children will have a learning platform, which we didn't have when we started, so everything had to be stored on SD cards, or on the memory of the device. Now with the learning platform all we need are the content on that platform - that is your work-flow area, your content distribution area. That helps with the scaling up.

The second piece of software that we have invested in at the moment is remote management software, which enables us to maintain the devices remotely, providing they have a connection. We install a small piece of client software on the device which enables our technician centrally or the local school technician to upgrade the device or re-image it or troubleshoot, send messages out to a device to help somebody to fix it if they are at home. This again is a different dimension.

The third thing that we have introduced is our partnership with one of the major telecom providers; we don't have the capacity within the LA to ever do somebody else's job for them. O2, who we have partnered with, have a hand in a large number of devices, why wouldn't we pay them to do it? We do not want to buy a team of people into recreate what they already do. Each device we get is set up to our specification, with safety things on it, with police identification: the moment you start to scale up you into some fairly significant issues.

The devices don't have voice or SMS features on them, for the moment. That again is the first phase of our journey in order to convince head teachers that this is safe: we have a fairly tight package. I know it's not what some theorists would argue we should be doing, but were doing it, they are only talking about it. In order for us to do it we had to start somewhere, and we have started with a fairly locked down level of connectivity but it's use unlimited so any child can switch that device on at any time of the day or

night, wherever they are and connect to the web. It is their own device, it's not shared with the family, it is identified to them, so on that one device they have all of their tools, they will have mobile PowerPoint, Word, Excel, digital video camera, digital still camera, GPS, concept mapping software, animation software, sound recording - the whole thing. Then the issue turns to re-training the teachers to think of lessons which will capitalise on those tools."

Training and support

"I think what is unearthed is the lack of change that there has been to the teaching and learning styles in a school or establishment over the decade. The majority of technology has been bolted on to an existing system. The good examples of what we have seen was where the teachers were setting more collaborative tasks, more "can you find out" tasks. Teachers treating the kids as researchers, as explorers: that seems to be the best way of working. They are expected to produce output and it might be that these are fantastic collaboration tools: then again, it is a bit of a barrier where we expect children to work individually. However, one of the core skills that employers want in the 21st century is to work in a team and yet in the education system we don't reward that. What I do know, is with Bluetooth, with shared learning platforms, collaborations become very easy and so does communication, as does the concept of one child in one school working with a child in another school: and we haven't even thought of that with synchronising timetables across schools and the local authorities. We could say at ten o'clock on a Wednesday, everybody in key stage 2, we have an opportunity here to do a hot seat on Egyptians across the authority. We might have one teacher starting it off and every child can log on and contribute to it, that's something we have never done but would be absolutely fantastic to try."

The importance of m-Learning in the future

"The future of m-learning isn't an 'if' anymore it's a 'when'.

The Building Schools for the Future (B.S.F) timetable is important for us as that actually puts a big injection of cash in, which is a big help to us. We are working on 2010/2011 to have it as a major offering. We would never insist that every school comes on board, that's the school's own decision, we just provide the climate in which they feel they would want to take part. I just think that the ownership of their own devices by the pupils would make it much easier for us to role this out. What we have to do is change this position of us providing a device bespoke for education, to maybe convincing all the telecoms providers that they offer a device that we have recommended when parents go in to get a mobile phone contract. I think we are probably talking about three to four years before it's fairly widespread, I would have thought.

If things progress in their current state in the UK I would probably say it might be a bit longer, but there are always catalysts in this. I think the i-phone is a massive catalyst: the single invention of the i-phone has stopped me having to convince head teachers and teachers that you can browse the web on a small device. Before it came out I had to do loads of convincing, it was always the first question when I presented - 'you can't do anything useful on that'. The i-phone has changed all that; mobile web has changed all that. Next year (2010) you will have to ask not to have it.

There are catalysts that might accelerate that change, but the big barrier at the moment is the assessment system. I think that if we were to start accepting digital outputs and credit children for it I think you would see a massive rush towards it. If QCA said they were going to accept digital projects that have been assembled as part of your assessment and credits I think you would see a big gold rush towards it. The other barrier is that the companies that currently exist in the educational market haven't got their heads round how to make any money out of this yet, and they haven't understood the complexities of it. This is as big a change as when we introduced the first computers into schools, because we are stopping working with the establishments and starting to work with learners. A whole different costing model: distribution models and ownership models are all changed, it really is a quantum leap up, but it is where we need to be.

O2 seem to have the signals that they want to get their head round this. We partnered with o2 because of their E safety record as well. They appear to be a socially responsible company. I think a school can't really do this on their own, an L.E.A can't really do this on their own, you have to get partners involved, and you have to get people to pull together. We were part of the MoleNet project and that has been useful funding again. One of the things we are proud of that we brought to that initiative is the procurement work we did around our project. So we set up the 'no surprises' data contract, so that a university, college or school couldn't be hit with a big bill, they just get one bill from o2, that's it, whatever the data you use, that's what you pay for. That sounds easy to say but that took a year of negotiating. Everybody else will be able to follow on from that, now that has been achieved. All the projects will have to do similar things, I think as a community we are gradually getting the pieces of the jigsaw coming together. You have heard over the past three days [at the mLearn 2008 conference], some of the research on the pedagogical, some the practical things, some of the mobile phone stuff; the GPS location-based stuff, will all come into being a way of working that children will expect. I will know I have succeeded when I have stopped talking about mobile learning.

You get involved in these initiatives and a lot of it is hard work; every so often when I'm feeling fed up I'll book a day in a school and go and talk to the children. I sat in on a year six maths lesson and it was everything I had in the back of my mind since I first started. The lesson started off, and the creative teacher plans with digital work better than he does with paper now. He said to me that it's easier to assemble three videos downloaded from YouTube on the Aztecs than it is to get work sheets on it. The lesson I was in was work on different triangle types, and he took a piece of software developed by the national whiteboard network, just for teachers to use on whiteboards, loaded the flash player on the PDA so that the children could have a copy of it, so again it's not the reserve of the teacher, the kids have it. That piece of software was put up on the board then said to the children, 'you need to use this to choose the starting angle that you want and then construct the triangle from that. Then you need to use the screen capture tool that you have used many times before to screen capture that, drop it into PowerPoint on the fly, create a PowerPoint file and when you have finished connect your Bluetooth up, see who else is online on Bluetooth, who you can pair with and send your file and receive theirs so you can carry on working together.

So the children weren't just consuming and working with the content, they were actually co-creators of the lesson. So their product was being beamed to someone else as their extension material. We were saying, it needs someone much cleverer than I to work out the value added to learning of a child constructing their own task to send to someone

else. The technology is subsumed into the background, these children were aged ten, they did not need to be shown how to use PowerPoint, Flash animation, use a screen capture tool and Bluetooth. They did not need to be shown that; that is much as much a basic skill as handwriting is. In that class that was the norm and an expected skill, it wasn't a special skill, they didn't have to go to a ICT suite for it."

End

Jon Trinder

Profile and Involvement in m-Learning

Jon Trinder works both as a network support technician and as a research student in the Robert Clark Centre for Technological Education at the University of Glasgow. He also has a consultancy specialising in providing advice and customised applications for mobile devices such as PDAs and Smartphones, virtual worlds such as second life and web based applications. In particular Jon advises on the use of mobile devices in educational environments.

The attitude of the pupils/students to m-learning

"I'm not convinced a lot of them have yet realised that the device they've got can be utilised as a learning tool. Even when we introduced PDAs to them it seemed to take a while to provide the trigger that, yes you can use them for playing your music, etc and that there are other things you can do with them to extend them to education. For example, you can put quizzes and stuff on them and can go on from that to realising they're able to use it as a learning tool. What I did find was that they used it in a way that was supportive to their learning. The camera was a popular thing and it's something that I think I will end up doing myself. One student in particular would go out and look round book shops or the library and think I want to read that sometime so take a picture of the cover of the book or the barcode and can then go back and investigate it further. So that is supporting their learning but not in the way we expected them to. We expected them to put materials on it or download things and read them. The other thing that I sense is, the ones that seemed to use the technology, weren't the ones that were directly involved in the work that I was doing but there were other post-graduates I knew: post-grads tend to be mature. I do wonder whether there is a sort of age divide or a maturity divide. Even the mature students who were under-graduates seemed to hook into using a mobile device quickly and I think it's because they have a few things to juggle with, like being a part timer, they have work to deal with, family to deal with and you have being a student to deal with, and having a mobile device with them, do whatever they want to, when they wanted. For many undergrads all their time can be put to working on the course, whereas the more mature student has all the usual hassle we have to deal with, bills at the end of the month, car maintenance, all these sort of things. So that gave them a way of either reminding them to do stuff or it was always with them so they could do it where they left off."

Training and support

"I don't think there is any training going on, certainly in my institution I'm not seeing any, I think we will need something. The actual use of the device for the students is not a problem; it's getting across to members of staff what the device can be used for. There is a quote from 'thefutureworks' look at education over the next few years, 'teachers or lecturers are less technically capable, and they are going to find it harder to appreciate what the current generation of devices can do'. It surprises me what you can do on one device, they are going to be completely surprised by it, so we need to bring them up to speed and understand what the technologies are actually capable of. How we are going

to do it is difficult because of the diversity of devices that are out there, but we will need to do something.

It could be said we didn't find anything [training] but we found odd bits and pieces, with some of the occasions where a group of summer school students who were recent school leavers who came from schools that traditionally that don't send anybody to university, from fairly deprived areas, they hadn't got their results, wasn't clear if they had the adequate skills to come in to the university, they do a sort of short course to bring them up to speed with physics and maths. They took to using the device, I think because some of them probably hadn't a computer at home, so they immediately adopted the hand held devices as a means to achieve what they needed to do. When we put revision questions on them, for them, we found it they were pushing for more materials far quicker than we ever expected. They started driving the process from their side. If we gave them questions, they would ask for the next lot, even if we hadn't got to the stage where they would have needed them. They were almost pushing the learning forward, they wanted to do it quicker, wanting to move at their pace. It's difficult for many staff to comprehend how they can adapt the materials they have currently got, which for some people are still hand outs, so they need to put these hand outs into a form that is useable on a small screen device. Then there are all the extra complications of how big the screen actually is, the incompatibility of the materials. Again it's a training issue because they can't technically understand what all the problems are, is it going to PDF, is it going to be a webpage, does its pedagogical value change depending on the size of the screen. If you think of something like a multi-choice quiz, you treat it differently if you can see all the four options at the same time, but if you can only see two of them at the same time and you are flipping between them, is it the same question and are you making the same judgement. There is a lot of this that crosses over to the computer aided assessment side of things."

The importance of m-Learning in the future

"I think in a few years it ought to become absorbed into everything else, and I suspect at some point it will, what I'm not convinced is whether it will be everything or a view that it will be niche things that use it more than others. There is a reminder that mobile stuff is personal; what works for me, doesn't work for you or maybe the next guy. I was talking to John Traxler earlier, and he wasn't sure if it was really working, or really out there, or whether it's appearing so thinly for different people using different aspects of it. It is out there, you can't see it because it's all different, so I think they will become increasingly important. What changes we have round the corner I do not know, projection phones, things on special glasses, displays become wider and more effective, augmented reality, all these sort of things. It's going to sneak up on us.

It's difficult to say how long it will take to become widespread. Five years ago I would have said five years, now I'm not too sure whether to say five or ten because the pace we move, obviously there is all the other global economy situation around us at the moment to confuse matters. Technology will be there. My personal view is FE and schools will be there long before universities are because we are too slow, we want to approve it works or insure it's got a sound vigorous basis before we use it, Whereas FE and schools will get out there and start using it to find out whether or not it works."

End

Andy Black

Profile

Andy Black is a technology research manager for BECTA (British Education Communications Technology Agency) who are the agency for the UK Government in supporting I.T. and e-learning to enhance learning in pre-HE educational sectors. Andy's recent research includes a project on managing education learning online productively, and another looking at the impact of mobile devices in (mostly) primary schools and some secondary schools in Bristol and Wolverhampton.

Involvement in m-Learning

Andy has written extensively on the subject and role of emerging technologies: "My role at BECTA is that I am a technology research manager that involves managing two quite large research projects, one of which is managing education, learning online, productively run by Manchester Metropolitan University and the other one is a one-to-one hand held computer project, that is being managed by Professor Angela McFarlane of Bristol University looking at the impact of mobile devices - primarily primary but some secondary - in Bristol and Wolverhampton LEA."

The attitude of the pupils/students to m-learning

"Talking about the age of students is important, I think specifically students don't notice the difference, and that's with every age and they just use it as a technology that's very natural to them and very 'to' them. I think we have some have some real issues with the approach we have taken as with regards to buying classroom sets, devices, where increasingly the trend is, especially in secondary aged pupils, wanting to use devices they currently have, which in most cases in their mobile phone.

I think the on the whole they don't find the technology difficult to use, I think there is evidence to suggest that a lot of young people don't use all the technologies' abilities, attributes, to their full, so if you are a very keen video taker, putting them on YouTube, you use the video function. You won't for example use a blogging function if you don't particularly like writing, so it depends what you use it for. There is a trend, we have a great trend for device, convergence, which a Lord Of The Rings type approach where you have one device which rules them all, your killer device, which is a high specification mobile phone, with video camera, recorder, etc. I think we are also now seeing a backlash against that where were seeing a general device which has a high functionality but also a trend for people wanting just specific devices. The best example of that is possibly the mobile phone and iPod, people still want video iPod for looking at video and currently things like the iPhone are too expensive for your average learner.

I think learners could exploit the organisational ability of the mobile devices -- what's that phrase that was used by Granine [??] O'Connor from Southampton University - about young people being 'digitally organised'. I think one of the problems we face is that young people are digitally organised on one level but are also digitally chaotic, which is my own phrase. This means they are more likely, for example, if they lose a password for a site or an email account to set up a new email account than to be bothered to find

out their password. You will have a lot of information stored in many different places and one of the problems we have with that is archiving and what happens when the trend moves on? If you look at it now, the decline of MySpace in favour of Facebook and those that we are initially going to face, especially if we were trying to put learning materials or portfolio type materials on non-education establishment hosted platforms."

Training and support

"I think there isn't enough support but I also think the teaching profession occasionally, and this is a personal view, use the technology being complicated as an excuse for not allowing change to happen. I am very proud of our teachers, but if you look at teachers who are using material creatively and technology creatively, they are just getting on with it to be honest with you. Our evidence from the IT test projects that we have done, what is interesting, especially at the primary age situations where young people are becoming the experts and teaching teachers. There is some good evidence there, digital video for example, kids learning how digital video in lunch time and after school clubs and acting as producers in class and teaching their class mates. This is a powerful peer teaching role but maybe some teachers are uncomfortable with.

I think pedagogical is different, but I think the elephants in the room use it as an over-worked phrase because when I ask at most mobile learning conferences 'what is it?', and the one answer that everybody seems to come with is assessment, and how do you assess digitally available evidence. My interest, as you know, is in Further Education and training, but it's the same in HE, where high school is based, let's say on surgeons or optometrists where you have to do practical things and I think we are very poor crediting formally non-text based learning."

The importance of m-Learning in the future

"I think it all becomes synonymous. I think it will become seamless, people will just not notice it. I think there are two levels, I think it will have an incredibly important role, especially if we talk about foundation degrees and partial study units where it will allow people to marry very busy working and social lives with study, I think that's a very crucial thing to get your head round and some of those opportunities for mobile learning are in those non-traditional HE areas of foundation degrees, etc.

Within secondary, I would say we will have wide scale access to personal devices within five years, I think that will require a very large sea change in how we facilitate the technology and how we support the technology and what is becoming interesting with more access to wireless broadband via a variety of routes, not via institution systems, we are going to face some really interesting issues in terms of privacy, issue in terms of security and internet safety, both for adults and for children. You can talk about internet safety for both adults and children."

End

Elizabeth Hartnell-Young

Profile

Elizabeth Hartnell-Young is a Research Fellow at the Learning Sciences Research Institute, University of Nottingham, and an Honorary Fellow, Faculty of Education, The University of Melbourne, Australia.

Involvement in m-Learning

"As a researcher I have done work in the UK in the mobile area with primary and secondary schools using videos and mobile phones, some self-funded, some funded by Becta, and I have been on the advisory board of the MoleNet project - mobiles in Further Education."

The attitude of the pupils/students to m-learning

"Once they realise that it is a possibility then their attitude is very positive, using different types of devices, but sometimes, because they've not been exposed to the notion of m-learning using mobile devices, their attitude at the beginning is that 'It's not possible, we don't know anything about it'. After some experience the attitude is really very positive. 'M-learning' is a term that adults use, it's not a term for students.

In some of the projects I've done the students used their own devices and they don't have any difficulty at all and in fact that's a benefit for the teacher because they don't have to train the students to use the devices: that point has been mentioned by a number of the teachers. We've generally found that with PDAs and mobile phones the problems are not with the devices, but more with the infrastructure issues, like over-loading and finding internet access in some sites. However, in the main nobody has reported real problems."

Training and support

"I think it all starts with awareness and in fact it's only individual schools, individual teachers, little pockets of stuff going on. If this is to become a really broad scale activity, there would need to be heaps of training, but I don't think it's all about saying 'we must all do this' and therefore you must go and do 40 hours of training. It's more realising there is a possibility that you could use these (what I like to call) mini computers, then you would have to say 'What do I need to know in order that I can start off my class doing it?' I always break it down into three aspects of teaching and I say there is the designing so your not just going to go about learning how to use the device without having a plan for the curriculum - e.g. 'what do I want to learn out of all the possibilities on the device?' Do I want to focus on, perhaps, image capture, or audio recording or that type of thing for an e-portfolio, or do I want to just use some mathematical functions, or read e-books - what is it that is the curriculum really? Then the next stage would be how am I going to teach myself the possibilities; I don't totally agree that they should learn everything first. I've found sometimes that if you start the teachers of at the same time as the students they can all learn together. It's about teacher attitude: If the teacher says I'm confident enough, I know the curriculum well and I know what the possibility is

but I don't know exactly how to do it, then start small in steps, and the students play and expand and bring things back into the group and then the teacher learns as well. I've seen some really good examples of that happening, so I don't want to suggest that teachers need a training course, I think they will learn in situ, in context, with the devices they will be using and with the real infrastructure like the band-width; don't necessarily send them out to some other centre for a long training course, except perhaps for a short course. The learning/training should happen in the real place, connecting to their own learning platform, and do it with mentors. In my projects I start small but I expect those teachers to share their knowledge with their peers - i.e. the teachers become trainers of other teachers. Somebody might be doing something that raised their awareness and excites them. We did one thing at the Nottingham Learning Centre and we told them how to connect to the network with a mobile, and they had a task to do (gathering evidence, etc) and then they had to Bluetooth it up to the platform. Just a hands-on activity so they could see the possibility for their own class. So, I'm absolutely passionate about training and professional learning, but not about courses."

The importance of m-Learning in the future

"I'm not that keen on the terms m-learning and e-learning. They're 'brands' and helpful perhaps as shorthand, but they're not something the kids need to know about: it's learning! It enhances learning in more situations and learning isn't confined to the classroom, school or university. But people always have read books on buses and trains; this just makes it easier to communicate and to connect and to record and - even texting: I don't mind the language it's just a different literacy. So to me it's absolutely full of possibilities but it doesn't have to be called m-learning.

PDAs are OK [in school], but they're so convergent with phones now it's going to become a bit of a problem for people if the only thing they're really worried about is phone calls and texting in class, that's going to happen anyway: if the thing they're worried about is image capture and being on YouTube and Bling and those sorts of things, it's about behaviour and policies about behaviour, not policies about devices that are needed. I think that people will realise that the size of computers is coming down and it's getting closer and closer to what they've called mobile phones and Smartphones but they're really multi-media computers. In fact Nokia when they brought out the N95 they actually put out a press release in which they called them multi-media computers. The problem is the name: why can't we learn with mobile phones? It's just the name that is the problem: we're allowed to learn with computers but not with mobile phones. It got that small and could do all these wonderful things and teachers lost control, felt threatened by the possibilities. However they don't seem to feel threatened by the PDA. We need to just forget about the device and think about the behaviour. So, there's going to be a few issues: the really big one is the resistance of teachers, facing the possibility of losing their last bastion of control. The curriculum is out of their control, the testing regime is out of their control, they're accountable all the time for where their school is in the league tables, but they have a little bit of control about banning mobile phones. Heads I've spoken to would be happy not to ban mobile phones, the parents are quite happy, so it's only the teachers. There will be an attitudinal change. There is also a financial implication that's really important because we have to work out if we're going to provide devices (like Wolverhampton) and have people pay for them, so that's really pushed the thing. Some of the schools in Nottingham started off a project with PDAs being provided by the local authority, and then once the schools had the chance to see how good they were they wanted to continue this so they provided the PDAs. In the

future it would be important to get to the next thing which is that we recognise that many, many people have their own computers in their pocket and we have ways to integrate that. That changes the costing. It then the cost becomes 'who pays for the connections, and who provides the infrastructure (which isn't ubiquitous yet). So the two main things are attitude and behaviour, and cost models.

Nothing is ever 100% accepted, and often 80% is fine and you can't always worry about the last 20%. It will happen; there will be a tipping point. If we start with the champions, and other people then take it up, and schools address the issues, it won't be the nation that sets the policy about it; it will be the schools. We'll get to the tipping point and then it will be like some of the heads said in our survey, they don't want their school to be falling behind, we want to be up with the latest. Things are going quite quickly so may be, say, five years I suppose, m-learning will be widely accepted."

End

The above were face-to-face interviews and all gave their written permission to be identified and quoted. The below interviews were conducted by telephone and interviewees were not asked for written permission to be identified and quoted.

Interviewee 8

Profile

A Local Authority (LA) strategy consultant for ICT, working with a number of schools, and also a teacher in a school which is a Suburban Middle School and a High School, covering years 5 to 11 (age 9-16). Subjects taught are ICT, and Enterprise and Business (using ICT).

[This interview took place over a mobile phone whilst the interviewee was walking through very high winds, meaning that hearing and maintaining continuity in the conversation was difficult, and thus it was also difficult to transcribe.]

Involvement in m-Learning

"The particular focus has been on using technologies research grants we won last year with a one year return to look into new technologies in school, and as part of that the usual focus of that was to look at using mobile phones in schools. In the initial sort of trials we tried out Bluetooth and trying to use them with the pupils: we got some mixed results really, so we initially then tried out the Nintendo DS consoles and tried using those as a means of, like a, collaborative tool in the lesson.

So we were looking at the facilities in the Nintendo DSs and encouraging the teachers to try them out, not so much actually any of the games on there but just the facilities of the consoles themselves. Now we've used sort of framework tools in lessons to develop enquiry and those have gone up on the school website, and we've tried out pupils' accessing those with mobile phones and with Minibooks and just through normal PC's to compare the way they can access them. Really the sort of findings are that even though they can access the internet with the devices, there is a lot more connectivity between the pupils. It's a real mixed bag of, you know, some had Bluetooth, some had the internet, some had the chat features. On the service we've done we found that most pupils, now most of their mobile phones can access the internet, they don't necessarily want to use those in lessons. We want to investigate into that a bit more and to enquire to what the reasoning is. Again, what the pupils are saying is that it is not necessarily so much that they don't want to in terms of they're not willing to, it's more a fact that there might be charges or it might be actually that the screen is smaller. Sometimes it is actually that they would rather not compare phones in lessons, but actually that seems to be quite a minor thing, though they are comparing types of phones because a lot of the pupils who have to get new phones and upgrade phones. As I say, the school we work with is, well it's an area of social deprivation but still all the kids get the new phones. That isn't actually the problem. It's more the fact that if they're at home it's much easier to go on the computer and look into the information there rather than trying to get it over the phone. In this last year, I've got an iPhone and the difference it's made in my thinking about the way I use the internet on the phone has changed radically because it's just obsessive: using wireless and obviously with the bigger screen it has made things much, much easier. So I can see that within this next year that sort of

access is coming. A number of the pupils' phones are a lot more suited for using the internet, so we can predict in this next year that that sort of access will improve. We are getting the improvement of things like data charges and larger screens which are problematic at the moment. So, as part of the project we looked into using the Nintendo DSs and the features in there and from the survey over 50% of the pupils had Nintendo DSs and were familiar with them. When you get into something like consoles and things like that, all of the pupils have... like most of them have access to one if they don't actually own one or two consoles. But, as I say with the DSs they had access to them or were familiar with them, but always was a real surprise from them about how they were actually going to be using them in schools. I would say 'Well why shouldn't you be using them in schools?' And they would say, 'Well, it's because it's not expected ... people think you're playing games or whatever. So, it's been interesting in that sense and even though the DSs have got different features to what we wanted them to do, they were actually able to do a number of things we tried out. A particular success was in French for example. The teacher could put up different sentences and then the pupils could take their sentences and correct them and send back their answers, and that seemed to work very well.

In the High School I have been working in, there is a staff of around 70. Within that school I would say we have about four or five actual people who are using it and championing in it. There is another group of around twenty teachers who have been developing using enquiry in the classroom, and all of them were shown the Nintendo DSs and how we could use them, but out of that group only two have actually then gone on to try it out, which I thought was surprising: I thought they would jump at it... you know, here's a free resource, away you go, but... and within that, of those who are using it there have not been many who have been very keen to use it on a whole class basis. They are quite happy with small groups but not as a whole class. I think that comes of concerns over behaviour; whether, you know, they would have different behaviour issues of trying to control that. But again, those teachers who have tried it have obviously enjoyed it and gone on to use them more so..... It's the actual hurdle of convincing people to use it.

There are around 50 junior pupils (age 9-11) and 30 secondary pupils (age 11-13) using the Nintendo's Brain Training game for Maths and enquiry. There is also team working: e.g. a business producing a game, with a finance person, a marketing person and someone producing a video game. Another school is using the multi-media functionality of mobile phones whereby pupils gather evidence outside and then Bluetooth them to the teachers PC. In maths the teachers could see how certain games related directly to what they were trying to achieve. So, the maths training and the brain training games, they could see that was asking them to get more maths questions and therefore that's where they would use those. If you are looking at other types of games on the DS then, you know, they couldn't necessarily see how it works, and a lot of the examples nationally like for example where Learning Teachers Scotland has got a lot of press with their use of games it's been more sort of at the Primary end where the teacher can use the games as the context but then plan around that English and Maths and Science and PT activities all around it because they've got the flexibility, because they generally are the sole teacher with that class and they can do that. What we found is that with the Middle School, that team can do that and they are willing to be flexible and be able to do that together as a team, but they said once you get into Upper School like Years 6,7, and 8 then it becomes more difficult, and then when you move into High School the actual timetable restricts how much collaboration can go on as well as actually people

being willing to teach outside of their subject, or using their subject to teach around the context of the game. Again, it's convincing people that, for example, the chat facility will be used appropriately and it should be, for example, like in the classroom you have certain rules about talking, you don't shout out, you might put your hand up if you have something to say, but there is no reason why you can't devise a code for working using these devices.

I can see how within this next year or so there is potential it's going to improve again with technology changing. As far as our project, we were linked to this Local Authority they looked at an experiment with a company where they could... well what they claimed was that it would take over the phone on entry into the classroom, with software on top of the mobile phone so it could be say a coding pad or something like that, but then at the end it would return the phone to normal when they left. Now again I thought the teachers would be quite happy because they could control it a lot more, but they seemed to have a lot of trouble because the project tailed off half way through the year really, partly I think because of the different variety of phones that were going in. And what we did want to try and do is to try and say, 'here's your school phone' and 'this is your home phone'. We wanted to try and get them to use their own phone, that being the link between home and school. So, if we could encourage them to use their phones to access our enquiry tools at school, then when they go home and we ask them to access the enquiry tools it's like that phone is the constant reminder or link between home and school.

In High School I have been working with closely the head has been very keen for me to try things out. The staff too, on the whole, are supportive even if non-participating. The parents support has also been quite good: even the traditionalists don't actually object, though there is some apprehension.

Because of my role, to a limited extent, information about what is happening in one school is passed on to other schools. Our project has been on the local news, and the BBC made a short video about the work as news story for their 'BBC School Report' project. I've been contacted by the organisers of a game-based learning conference about talking about our project there."

The attitude of the pupils/students to m-learning

"Pupils find it very easy, whether it's PCs, laptops, mini-books or mobile phones. Teachers and network managers are the problem. We compared using the Minibooks to using computers at home and the laptops. And, you know, even though the software is slightly different they don't seem to have any problems really. They adapt very easily. It's more the teachers who are unfamiliar with the software and therefore they are not as keen. But also when the Minibooks came into a number of schools, the network managers would wipe them because they knew that they could control that better and make it much more secure, whereas we would be suggesting well just let them just use the Minibooks as is, and then if they need to transfer it to their school accounts or whatever then they could use a USB pen and whatever and try to check it on the way in, but they went to self controlling as well."

[Audibility deteriorated at this point]

"They always enjoy it and they always tell me how they did and always say they are surprised to be using them, but what I don't know is of the long term effect. In the examples of views, it seemed like very much that small groups over the course of a year and it has not been like a sustained, here you are, you can get your mobile phone accessed to the internet in every lesson, and then just to see how it becomes part of the norm. Again, in my own practice using.. with an iPhone, it's changed the way I work because, not only am I [inaudible] more using the email but also if I want to find out I can very quickly find out using Google or whatever and you can search for it. What I'd like is really that sort of aspect of... in lessons where the pupils say, well I need to research that and pop the phone out and use it, but it's not quite there yet. But when they actually do use them they do seem to be keen to try them out, so the attitude is positive but I don't know about long term. I think a further example of a school we took this week who had a group of problem pupils who, rather than the teacher sort of saying, well you need to do this course or can you come and do this, he laid out what coursework they needed to do and the pupils come in and they have to be there, but once they're in there they might be on the internet and they might be using the mobile phones to chat to each other and texting and all this. But he said actually it settled down after a while because they realised, well, they got a bit bored of that. They realised they'd got the work to do ultimately so .. Giving that free reign, he reckons that actually they can then ... you know, they do get on and do what they're meant to. So again, if there was that sort of relaxing of use of them in schools, again whether it would ultimately settle down a bit and they would be able to do their work as well as feeling they could use their mobile phone technologies.

There's an adult numeracy track where we work with very low ability maths students and they've been using the maths games a lot and they seem to like those. But even within that there are things like ... they do.. the software on the mobile phones let them do [inaudible] and teachers answering questions and obviously thirty questions to answer of addition, subtraction, or whatever, and then they really see who finished first. But again they started using that and enjoyed using that but then somebody realised actually you could still win and be the first by putting wrong answers in. So, even though I used them, the teachers had to sort of establish a way of working and checking that, but when they have, as you say, figured out a way round it. But generally it has been used across the board really; very much mixed ability students. The students we have been using – especially for the research – have been recruited to come in to do ... you know, they have been introduced to... because I wanted to try out different ways of working in schools and enquiry, so that's worked very well, and that's part of the [inaudible] Transfer Partnership between school and the local University."

Training and support

The kids are very much aware of how to use those things [the games consoles, minibooks and phones]. The schools internet policy includes basically all aspects of accessing the internet, so if they should be accessing inappropriate images on their phones, that's hopefully covered by the schools internet policy, in which case anything which is deemed to be inappropriate should be reported and there is a mechanism for that. Mobile phones are allowed in schools but they are not normally allowed to use their phones within lessons.

We have an associate in school who is very good and is working with the teachers to develop enquiry in the lessons, and that has actually really helped to drive this work as

well. I do some of the training, too. I have done the work with the Minibooks and teachers and I have done some work, as I say, with the DS's and as part of that, you know, we do training with the teachers and then let them take them away to practice. Therefore, you know, it's been interesting in that sense, but in terms of actual mobile phones we saw that everybody knows how to use them and yet actually I think, especially the teachers, they probably use very few features within those, but the kids are all very much clued up on how to use them.

I've got a teacher who is sort of coaching another teacher in using the Nintendo DS's in lessons, thinking about the types of questions you might be asked when using them. But mostly people are getting their head around how to use the technology first and then see afterwards how they might then use it for teaching afterwards."

The importance of m-Learning in the future

"It will be essential as mobile phones get better. Particularly iPod things like iPod Touch using WiFi instead of paying for access on the mobile phones; they have a decent sized screen, and applications are being developed for them.

I was looking at the Horizon reports for the last few years, and how they say how mobiles have grown more and more useful as [inaudible] multimedia tools that capture images and video and found that it is used in schools. In terms of the school I work with and the Knowledge Transfer Partnership, the pupils are now capturing images and short video clips and then they are bringing them back to the teacher and then Bluetoothing those to her computer and then she is using that to gather evidence. In our project we are looking at iPod touches which could be wireless – there wouldn't be anything in terms of connectivity cost - but also the fact that you can access the internet on a decent sized screen and can also look at the applications which are becoming more and more important, which could actually fit the needs of the lessons.

I think as phones become more able to access the internet and the screen size increases and again the more pupils have things like wireless to pay for their cost, I think really things like schools getting more coverage of wireless and things like that, I think really we will be getting better use in the next two years in that sense, but I think to be honest it's probably going to be about five years before it is more common. But again, five years is quite a long time in terms of how the technology... if you look back five years and how things were and how mobile phones have changed it's a phenomenal difference. There's still this big gulf between the ICT that they use at home and what they do in school – how they are all familiar with different social networking sites, they can take video, upload video and edit video, and yet they come into school and they are still doing a lot of stuff which is still quite... it hasn't changed in many years. It's that change of mind from actually people doing all this social networking and how that's valued within schools, and then how that's valued across everybody. So, I think even if you are talking ten years you are still going to get that sort of range of people who are very far on with it and other people who are hardly using it, but will use the mobile phone for communication but not actually use, you know, anything more than that."

End

Interviewee 9

Profile

Teacher, ICT Officer and team leader in a Suburban Junior School, years 3 to 6 (age 7-11). Subjects taught are all (junior school) subjects.

What subject(s) do you teach?

All fourteen, being a primary school.

Are you currently involved in m-Learning?

- **Actually using m-Learning in your teaching?** Yes, Nintendo DSs, no internet connection. Very easy to use and teachers skill set doesn't need to be high, are very portable and are cheaper than PDAs or net books

- **Do you develop own m-Learning materials?** No

- **Or use off-the-shelf materials?** Yes, adapt games and download games from the internet. Also one called to DIY allows children to create their own games.

- **Not teaching but researching or involved in some other way?** No

Are you aware of others in your institution involved in m-Learning? Yes. All 12 teachers use them.

How many teachers are involved? 12

How many pupils are involved? 350. 30 consoles for 350 children, used 20 minutes at a time on at least 3 days a week if not 5.

What age group are pupils? 7-11

What subjects are being taught? We're using the Dr. Kawashima's Brain Training programme to teach maths and mental arithmetic and problem-solving exercises. (Nintendo know about this work and have pointed out that this game was never intended to be educational). Also PictoChat, a chat system that allows consoles to chat to each other, used to practice writing. Teacher can see all consoles, children can see each others and learn and feedback. Introducing other games for problem-solving exercises, to used in teams, and film things, write things as a team. We are soon to introduce other programmes such as foreign languages, and increase the time for pupils to use them from 20 minutes to one-and-half hours. Also, we're thinking of introducing Nintendo Wii as well. They have in Scotland: they're light years ahead of us in this area.

What types of activity do you use mobile devices for? See above

What level of support do you get from the:-

The head teacher Very good

Other teachers Very good - all are involved: it is just another tool, and good teachers use good tools.

LEA Very good - it was their idea

Parents Very good: the original batch of DS consoles were a 'loan' for a project, and when there was a danger of the loaned ones having to be returned, parents wanted to help raise money to buy more.

Is your/organisation's work in m-Learning widely 'advertised' or is it a simply kept 'in-house' for the time being? Widely known throughout the borough, has been presented at the Handheld Learning conference and other conferences, has been presented to other boroughs, and has been in a Futurelab article.

What, in general terms, is the attitude of the pupils to m-Learning?

Children are natural users of games and games consoles. They are enthusiastic, engaged and with complete and utter concentration. They'd rather use them than pencil and paper.

Do they find mobile technologies:-

easy or difficult to use? They find them easy to use because most have a games console at home anyway.

beneficial to their learning?

Yes, they do. They know they're learning but learning in fun way.

Are pupils using mobile technologies appropriately trained and supported? Yes, they are taught the basics of the games.

Are pupils with non-typical needs supported in their use of mobile technology?

Yes, under the normal support provided to children with special needs.

Can pupils access support (in the use of mobile technology) out of school/school hours? No, not necessary thus far: they don't take the consoles home.

Is there guidance for pupils in acceptable uses of mobile technologies?

Yes, but is not so important as they cannot connect to the internet. It is just another part of their day.

Have you had any staff training or staff development in the use of mobile learning technologies?

Yes, and I do the training of all the other staff.

Have you had any staff development relating to pedagogical aspects of mobile learning?

Not needed: it's just another tool.

Are you able to deliver the above training to colleagues?

Yes

View of the future

Do you think m-Learning will be important for teaching and learning in the future?

Yes I really hope so.

Do you think the use of m-Learning will ever become widespread in your institution? Yes

How long before that happens? Is already.

Do you think the use of m-Learning will ever become widespread in your local education (geographical) area? Yes

How long before that happens? 2-3 years

Do you think the use of m-Learning will ever become widespread in the UK? Yes

How long before that happens? Longer, say 3-5 years.

End

Interviewee 10

Profile

A teacher, ICT officer and subject leader in a suburban Primary School. Subjects taught are all (primary school) subjects

What subject(s) do you teach? All subjects (primary)

Are you currently involved in m-Learning?

- **Actually using m-Learning in your teaching?** Yes
- **Do you develop own m-Learning materials?** Yes
- **Or use off-the-shelf materials?** Yes
- **Not teaching but researching or involved in some other way?** No

Are you aware of others in your institution involved in m-Learning? Yes, 3 class teachers year 6.

How many teachers are involved? 3

How many pupils are involved? 61, each have a Nokia N800 or N810 internet tablet.

What age group are pupils? 10-11

What subjects are being taught? Vocabulary, maths, history, geography, using Nokia N800 Internet tablet.

What types of activity do you use mobile devices for? ??????

What level of support do you get from the:-

The head teacher Good

Other teachers only those involved

LEA Good

Parents Good - all agreed to allow the N800 internet tablets to be taken home.

Is your/organisation's work in m-Learning widely 'advertised' or is it a simply kept 'in-house' for the time being? Not too widely, but most schools in the area know: there has been an article in the LEA magazine.

What, in general terms, is the attitude of the pupils to m-Learning?

They really like them: there is a positive effect.

Do they find mobile technologies:-

easy or difficult to use?

Very easy, they're using them 24/7.

beneficial to their learning?

Some realise, some don't. It depends how positive their attitude to education is.

Are pupils using mobile technologies appropriately trained and supported? A little. They train themselves mostly. They're not afraid of trying things.

Are pupils with non-typical needs supported in their use of mobile technology?

Yes, the special needs pupils, especially those with Asperger's or dyslexia.

Can pupils access support (in the use of mobile technology) out of school/school hours? Yes, the learning platform is web-based and can be accessed from a PC or a

mobile; pupils can message their teacher; there is an emergency email address for learning platform problems.

Is there guidance for pupils in acceptable uses of mobile technologies?

Yes, definitely, and parents as well. They have e-safety lessons.

Have you had any staff training or staff development in the use of mobile learning technologies?

Not really. Self-taught. Nokia's training agents come in from time to time.

Have you had any staff development relating to pedagogical aspects of mobile learning?

No not necessary. A good teacher is good anyway.

Are you able to deliver the above training to colleagues?

Yes.

View of the future

Do you think m-Learning will be important for teaching and learning in the future?

Yes, you can't stop it. All children have mobile phones.

Do you think the use of m-Learning will ever become widespread in your institution?

If teachers let it! Some are not comfortable with the technology and avoid the new. The cost of devices could also be a hindrance.

How long before that happens? 5 years

Do you think the use of m-Learning will ever become widespread in your local education (geographical) area? Yes, as above.

How long before that happens? 5-10 years

Do you think the use of m-Learning will ever become widespread in the UK?

Government action and financing will have an important part to play.

How long before that happens? More than 10 years.

End

Interviewee 11

Profile

A teacher, ICT Officer and Learning Technologist in a suburban Primary School.
Subjects taught are ICT to years 3 to 6 (age 7-11).

What subject(s) do you teach?

ICT years 3-6 (thus age 7-11)

Are you currently involved in m-Learning? Yes

- **Actually using m-Learning in your teaching? Yes**
- **Develop own m-Learning materials? Yes**
- **Or use off-the-shelf materials? Yes**
- **Not teaching but researching or involved in some other way? No**

Are you aware of others in your institution involved in m-Learning? Yes, 5 or 6

How many teachers are involved? 5 or 6

How many pupils are involved? 120-140 at any one time

What age group are pupils? 6-10

What subjects are being taught? No specific subject other than ICT

What types of activity do you use mobile devices for?

School trips. Use Assus netbooks, do podcasts and update blogs, videos and audio to website using WiFi and 3G. Lots of use in school using Assus, mostly for web browsing.

What level of support do you get from the:-

The head teacher Good

Other teachers Good

LEA Good

Parents Yes, very supportive and use the school blogs.

Is your/organisation's work in m-Learning widely 'advertised' or is it a simply kept 'in-house' for the time being? No, but known in the borough/LA

What, in general terms, is the attitude of the pupils to m-Learning?

VERY positive - learning is fun.

Do they find mobile technologies:-

easy or difficult to use? Easy, though their special needs children need extra support.

beneficial to their learning?

Yes, learning with fun

Are pupils using mobile technologies appropriately trained and supported? Yes

Are pupils with non-typical needs supported in their use of mobile technology?

Yes, extra support for special needs pupils

Can pupils access support (in the use of mobile technology) out of school/school hours? Not necessary, devices not taken out of school.

Is there guidance for pupils in acceptable uses of mobile technologies?

Yes, there is an LGfL [London Grid for Learning] scheme, and it includes parents and staff, too.

Have you had any staff training or staff development in the use of mobile learning technologies?

Yes, good training including from the Borough LA, lots of courses.

Have you had any staff development relating to pedagogical aspects of mobile learning?

Yes, as included the LA courses.

Are you able to deliver the above training to colleagues?

Yes

View of the future

Do you think m-Learning will be important for teaching and learning in the future?

Yes.

Do you think the use of m-Learning will ever become widespread in your institution? Yes

How long before that happens? It already is.

Do you think the use of m-Learning will ever become widespread in your local education (geographical) area? Yes

How long before that happens? 2-3 years

Do you think the use of m-Learning will ever become widespread in the UK?

Yes

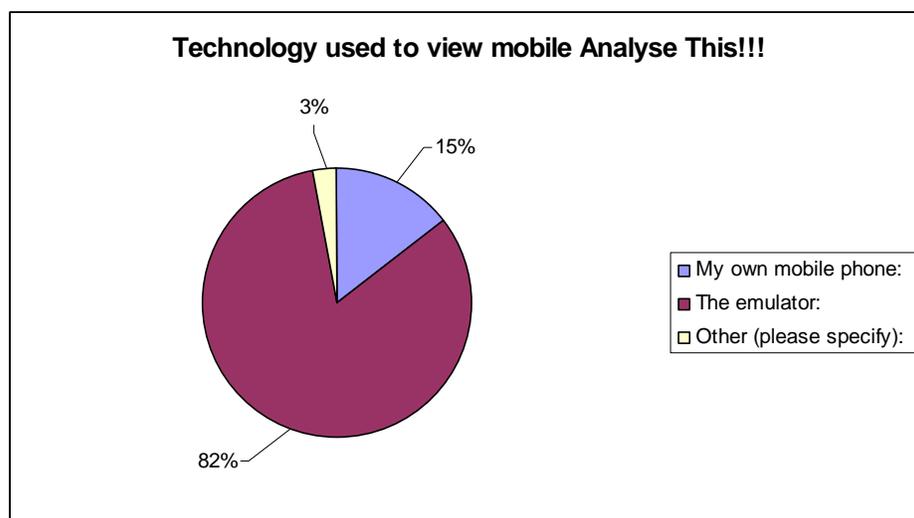
How long before that happens? Maybe 10 years.

End

Evaluation of the mobile version of Analyse This!!!

The evaluation of the mobile version of Analyse This!!! focused on the mobile elements of the learning object and was tested by 34 Undergraduate students from the Department of Information and Communications, Manchester Metropolitan University (detailed evaluation of the learning object itself can be seen in a previous report to LearnHigher by Griffiths and Craven, 2008). Each student was asked to work through Analyse This!!! and provide responses to an online questionnaire. The following section presents results from this questionnaire.

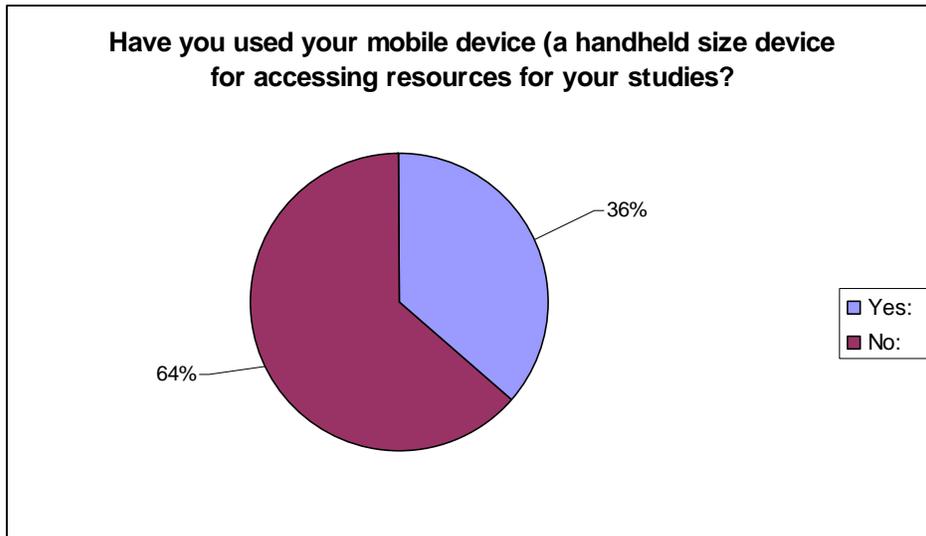
Figure 23: Technology used to access mobile Analyse This!!!



Of the 34 participants 82% used an emulator version of their own phone, 15% used their own mobile phone and 3% reported that they used something other (but it was unclear from their response what this was).

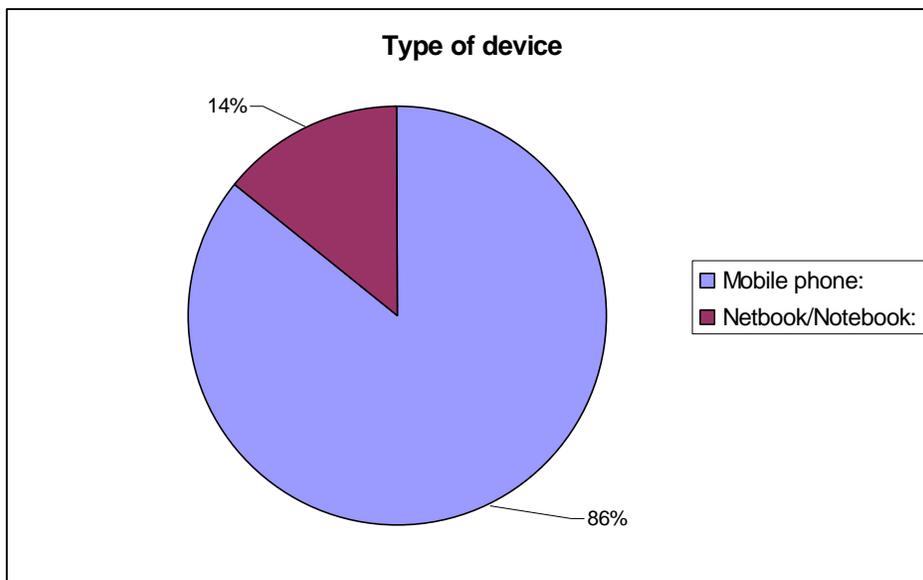
The reluctance of participants to use their own phone was largely due to the cost of accessing mobile Analyse This!!! for the purposes of this evaluation. Emulator software was provided which enabled participants to use mobile Analyse This!!! as if from their own phone, but actually using a PC.

Figure 24: Use of mobile technology



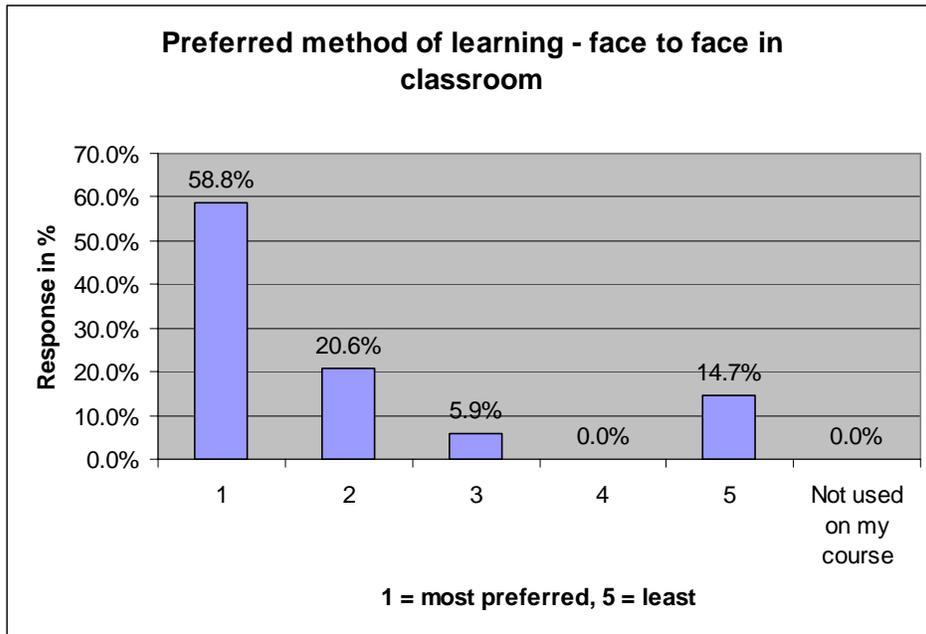
The majority of participants, 64%, had not used their mobile device to access mobile technologies and resources before.

Figure 25: Device used



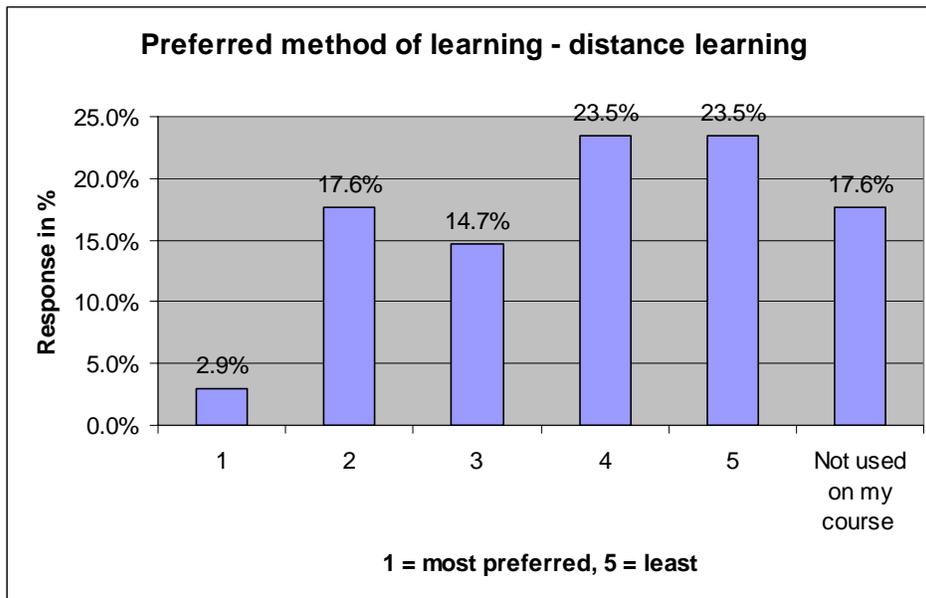
Of those participants who had used their device to access mobile resources 86% used a mobile phone and 14% used a netbook or notebook.

Figure 26: Preferred method of learning – face to face in classroom



Participants were asked a series of questions regarding their preferred method of learning, where 1 = the most preferred method and 5 = the least preferred. The majority of participants, 58.8%, reported that they preferred face to face in the classroom learning, with only 14.7% reporting that this was their least preferred method.

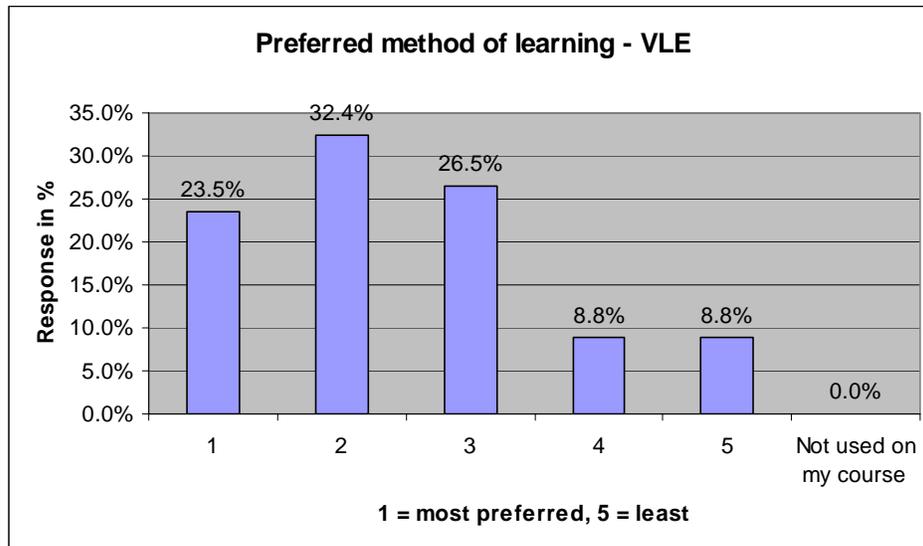
Figure 27: Preferred method of learning – distance learning



Responses to distance learning were mixed, with 17.6% of participants reporting that this is not used on their course and some participants indicating that they do like distance learning (2.9% and 17.6%). However, for the majority of participants this was

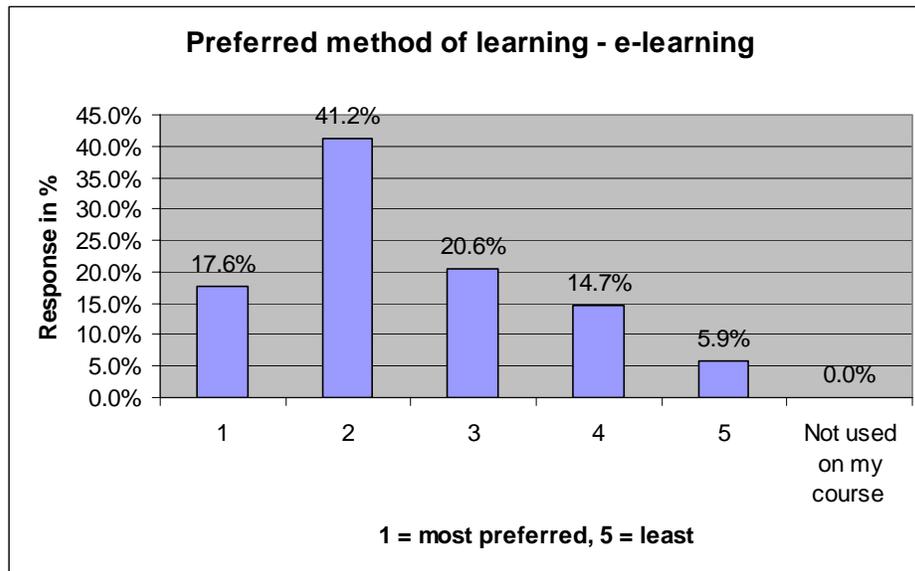
not a preferred method, with 23.5% reporting that it was the least, and 23.5% the next least preferred method of learning.

Figure 28: Preferred method of learning – VLE



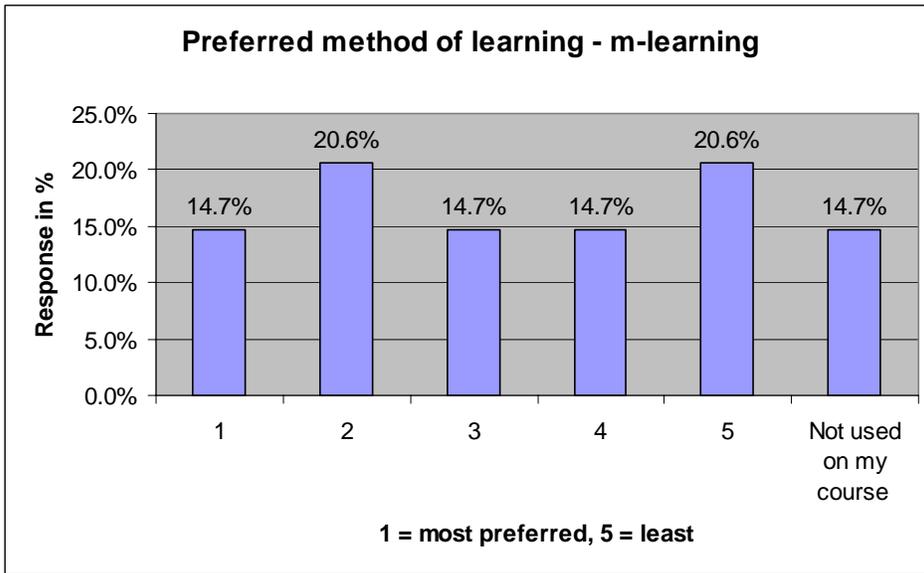
The majority of participants responded that use of a VLE was either the most preferred, 23.5%, or the second most preferred mode of learning, 32.4%.

Figure 29: Preferred method of learning – e-learning



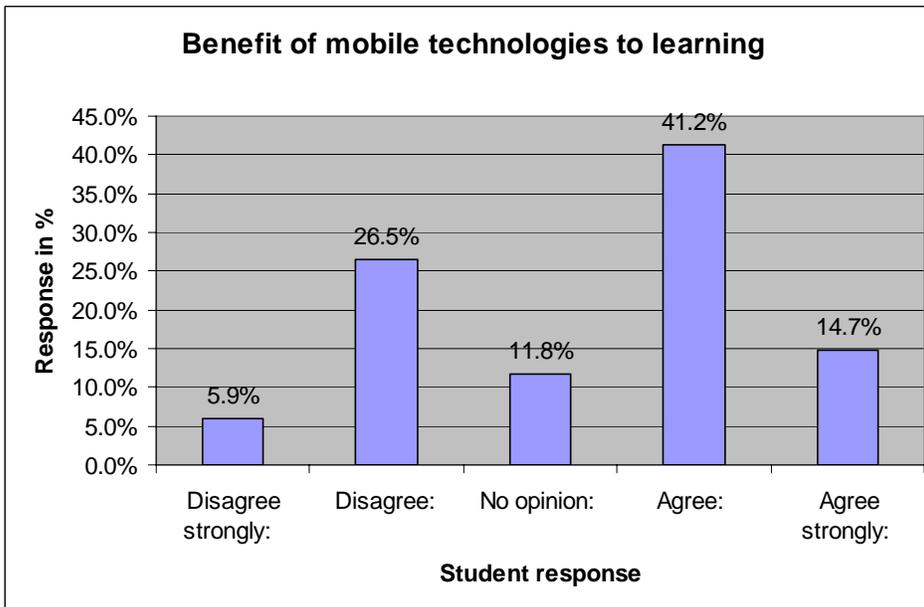
The majority of participants reported that e-learning was a preferred method of learning, with 17.6% stating that it was the most preferred and 41.2% the second most preferred.

Figure 30: Preferred method of learning – m-learning



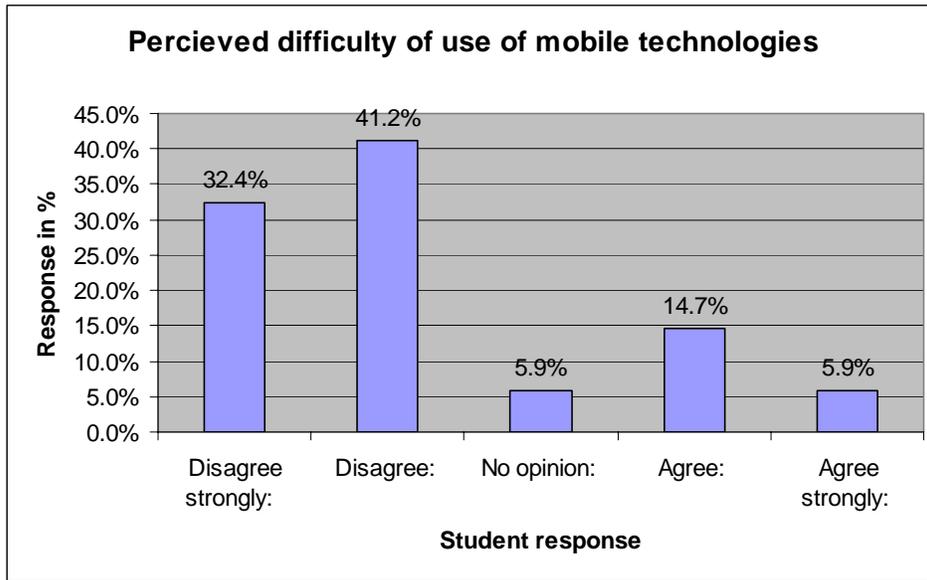
Responses to m-learning were mixed, 14.7% of participants responded that this was not used on their course, 20.6% and 14.7% respectively that this was their least preferred or second to least preferred method of learning. Conversely, 14.7% and 20.6% felt that this was their most preferred or second to most preferred method of learning.

Figure 31: Benefit of mobile technologies to learning



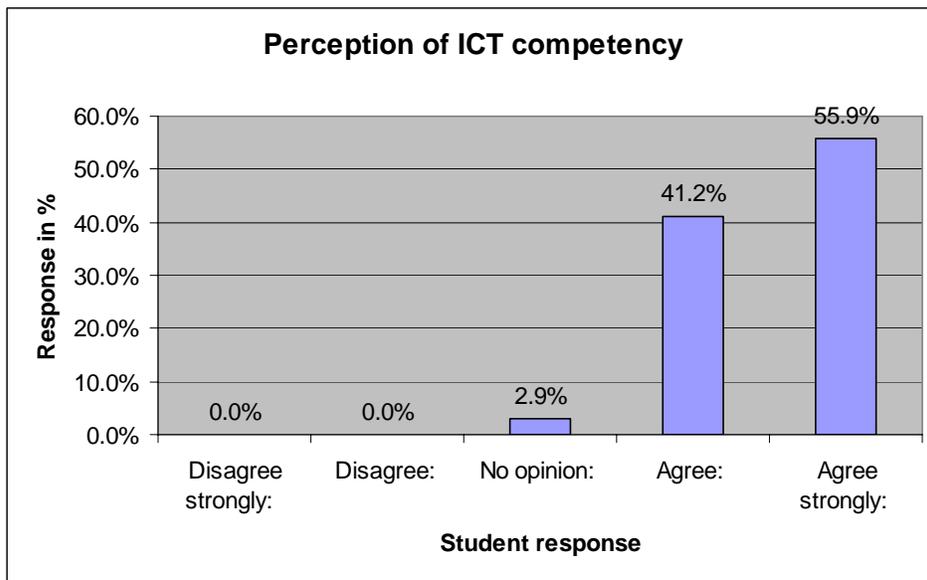
The majority of participants, 41.2% and 14.7%, agreed or agreed strongly that mobile technologies and resources could be of benefit to learning.

Figure 32: Perceived difficulty of use of mobile technologies



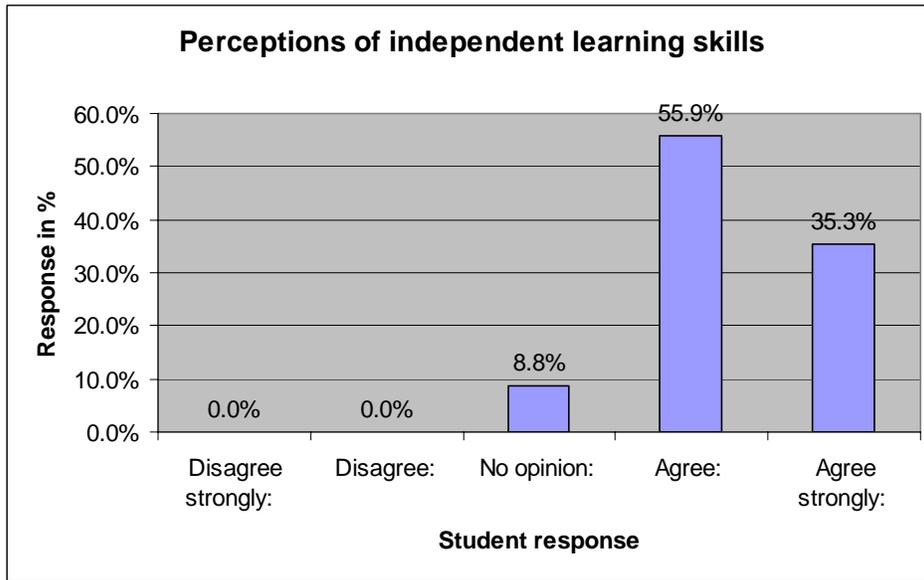
A very large majority of participants disagreed that mobile technologies would be difficult to use (32.4% and 41.2%).

Figure 33: Perception of ICT competency



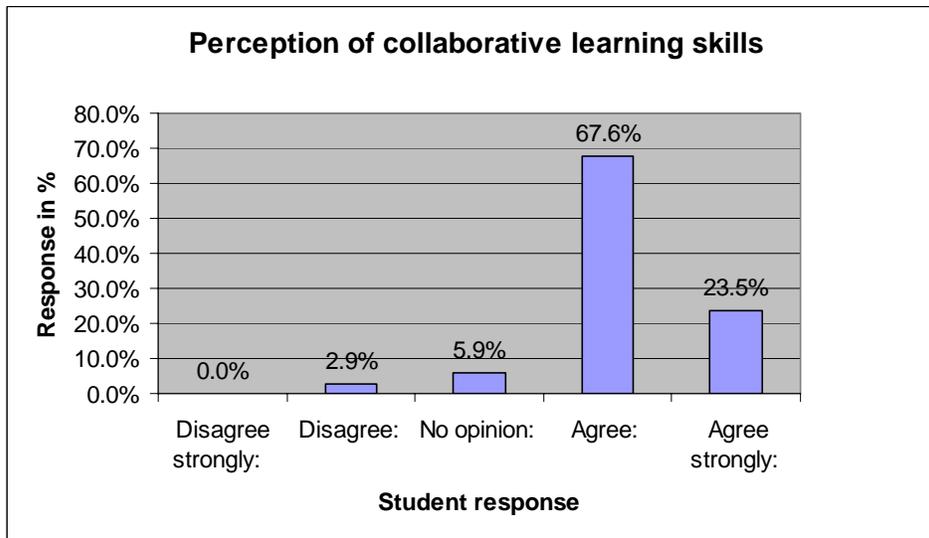
Almost all participants agreed or agreed strongly that they were competent in the use of ICTs (41.2% and 55.9%).

Figure 34: Perception of independent learning skills



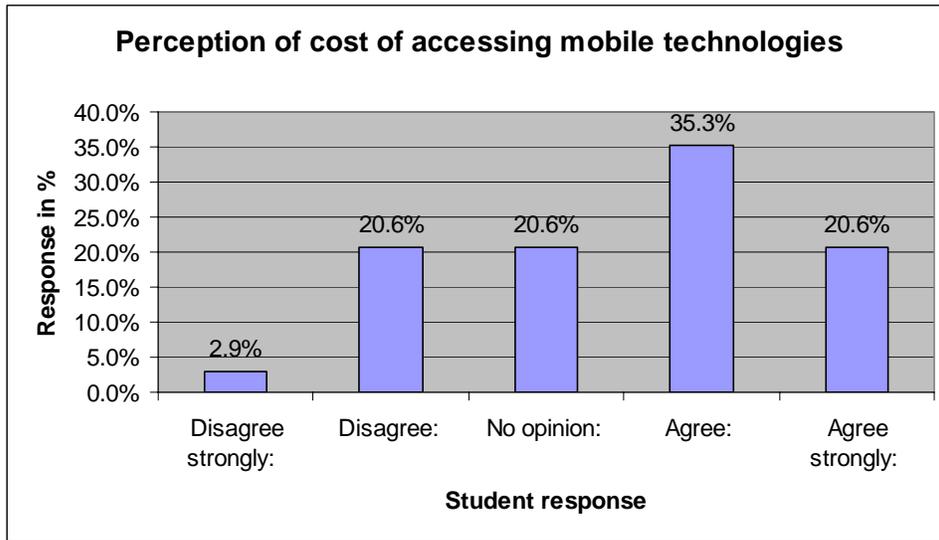
Almost all participants reported that they either agreed, or strongly agreed, that they had good independent learning skills (55.9% and 35.3%).

Figure 35: Perception of collaborative learning skills



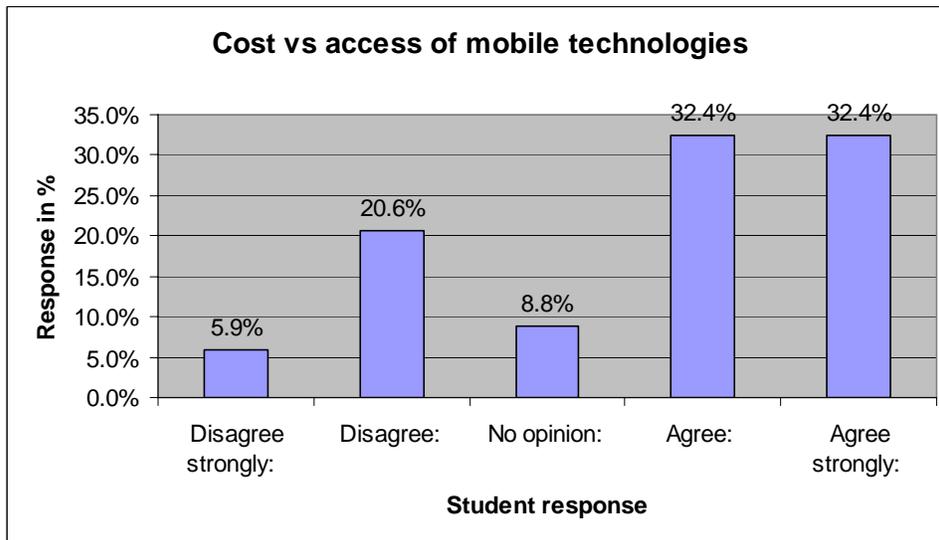
Almost all participants reported that they either agreed, or strongly agreed, that they had good collaborative learning skills (67.6% and 23.5%).

Figure 36: Perception of cost of accessing mobile technologies



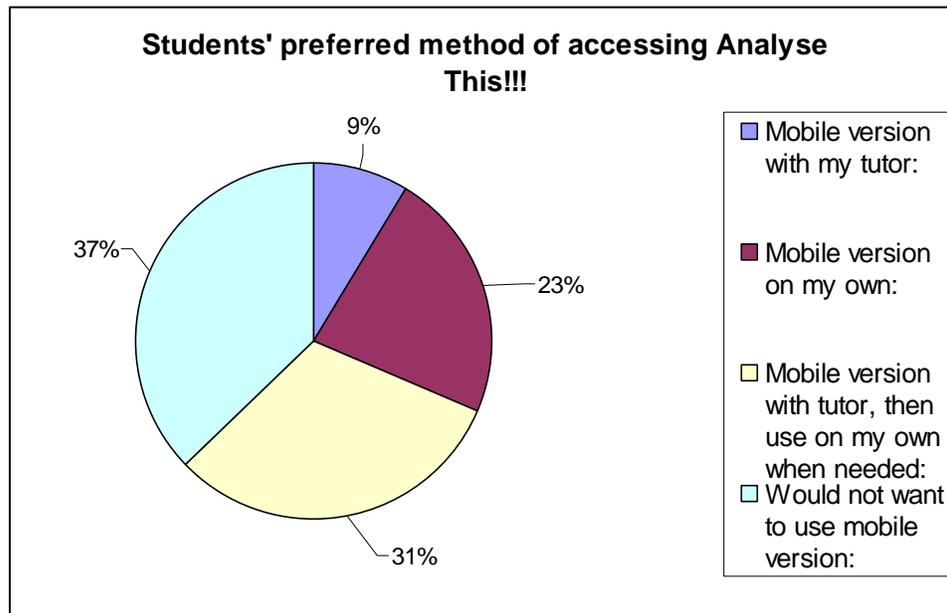
The majority of participants either agreed, or agreed strongly, that accessing resources via mobile technologies would be expensive (35.3% and 20.6%).

Figure 37: Cost versus access of mobile technologies



The majority of participants responded that cost would affect their use of mobile resources (32.4% and 32.4%).

Figure 38: Students' preferred method of accessing Analyse This!!!



The majority of participants (63%) reported that they would use the mobile version of Analyse This!!! with 37% preferring not to use the mobile version.

Of those who would access the mobile version the majority (31%) would prefer to use this with a tutor first, and then use it on their own when needed, 23% would use it on their own and 9% would use it with their tutor.

Participants were also asked to provide some comment on their expectations of mobile resources, a summary of the responses is provided below:

- A quick summary of the valid information needed
- accessibility, efficiency and easiness
- bitesized information
- Ease of use
- easy and feasibly as in cost efficient in order to be used
- everything I can get in my webct
- Everything that I would expect from a face to face learning resource
- Fast connection
- free access to web space
- good learning options and easy to access work and info
- I barely use my mobile phone at all
- i would expect more information
- I would expect the same experience that I would get from the PC - ie the download/web page access time, the full view of all information, the links to work effectively etc
- I wouldn't use it as I wouldn't be able to afford my phone bill
- Information which i can use to enhance my learning skills and help me with my studies
- Learning material which you can use on the go

- learning on the move
- Less information then using the internet
- more chances or receiving information when wanted
- no cost when it comes to learning (free learning via mobile phone)
- not sure as i have never used one before. i don't enjoy using my mobile as a learning resource though
- Portability is the main benefit. Would have to have guarantee that would not incur additional cost for mobile use. Would need to have option to enlarge fonts as difficult to read on mobile screen, which would discourage frequent use
- Same access to learning as with a PC. Easy use
- same at the internet just in smaller print on smaller screen
- Small, hard to read text, but mobility to see learning resources
- that it is easy to read on a smaller screen, although the iphone has the capability of enlargement it is not always the best way to read something as there is the chance of clicking another link inadvertantly
- that the material is easily accessable
- To be able to access anything when needed without it costing too much

Key findings

Survey and focus groups

Learners and their learning experience

- Modes of learning used by the majority of respondents were either face-to-face or e-learning, with using distance and m-learning.
- A mix of methods were used to assess and develop learners' skills, including essays, presentations, electronic submissions, examinations, and reports.
- Majority thought that learners find mobile technology particularly beneficial to their learning experience, but that the use of appropriate technologies is important – not using them 'just because they are there'.
- A more mixed response was given when asked whether students are competent in using ICT: *They haven't actually thought about what can help them in terms of m-learning because obviously it's quite a new phenomenon, I don't think they can see that connection yet, everybody talks about them being digital mainframes but they are not.'*
- Respondents thought that students have better collaborative learning skills than independent learning skills.
- No clear picture emerged as to whether appropriate support, training and guidance is given for learners, nor guidance on acceptable use of mobile technologies.
- Feedback from students is gathered by the majority of survey respondents, but not always used.

Learning and teaching

- Some participants had attended training in mobile technologies but this is quite patchy, with some commenting that they are 'self taught'.
- The majority of participants had not received any training in pedagogical issues related to mobile learning, with comments such as a lack of time for training and problems with the speed of which technologies change as influencing factors.
- A split response to whether institutions have an e-learning strategy, or a teaching and e-learning strategy which incorporates m-learning, with examples of good practice and plans to incorporate m-learning into future strategies.

- Many, but not all, agreed that their institution provides satisfactory ICT investment, but the majority did not think this included investment in mobile technologies, with comments from focus group participants that investment needs to take the changing nature of mobile technologies into account.
- Although investment in ICT technology does not appear to be satisfactory in institutions, the majority felt that the use of mobile learning will be a vital element for student learning in the future and that the use of digital learning resources will be an important added value to pedagogy.
- The majority were interested in creating m-learning resources or to adapt existing e-learning resources, but nearly half did not think opportunities at work exist for them to become technically proficient in resource creation for mobile devices
- For those who are proficient, the majority felt that opportunities did exist for them to disseminate their skills to others.
- Respondents provided a wide range of activities they would want to use mobile devices for, including collaboration and reinforcing learning, distance Learning, supporting the development of individuals reflective capacities, extension of learning activity outside of face to face workshops and seminars, student generated content, and for field work, projects.
- Many suggestions were given to the developments in m-learning that would make a difference to their learners, including access to wireless networks, cheaper texts, better support for video and MMS, and easy access to laptops.
- Suggestions for support systems needed to be set up in order to use m-learning included discussion around pedagogy, practical support for creating mlearning artifacts, face-to-face support, information on what technologies are available, and information on how to enhance the student learning experience.

Technologies and infrastructure

In the next 10 years, respondents felt their institution should be giving priority to the following, with equal importance:

- Infrastructure.
- Staff training in the use of mobile technologies.
- Development of new educational resources for use with mobile technologies.

Interviews

- Learners are already using mobile technologies in their learning.
- Young people don't consider those technologies to be new technologies but just apart of normal life: "technology is only technology if it was invented after you were born".
- Technologies are being used by young people in ways which were never imagined.
- Mobile phones are being used in schools - even where they are banned.
- Pupils/students find the technologies easy; it's the teachers who find it difficult.
- Teachers find the 'new technologies' more difficult to learn than the learners do.
- Teachers have to adapt to the fact that learners are using mobile technologies.
- There is a gap between what the students are already doing and what institutions are able to provide for. "Schools can't go on buying under-powered desktop PC's and filling rooms with them when students are already coming equipped with a more powerful machine in their schoolbag."
- mlearning is particularly useful in work-based learning.
- Building Schools for the Future (BSF) funding is likely to drive greater use of technologies - including mobile technologies.
- It is likely that in 2-3 years the use of mobile technologies will become more prevalent in education.
- It is likely to be 5-10 years before mobile technologies are in widespread use throughout education.
- "The future of m-learning isn't an 'if' anymore it's a 'when' ".

User evaluation

- The majority of participants were either unable or not willing (due to cost) to access mobile Analyse This!!! with their own mobile device.
- The majority of participants have not used their own mobile device to access resources.
- Where participants had used their device to access mobile resources the majority were using mobile phones rather than netbooks or notebooks.
- The preferred method of learning was face-to-face in the classroom, followed by e-learning (combined 1+2 rating), VLE, m-learning and distance learning.

- The majority of participants felt that use of mobile technologies could be of benefit to learning.
- The majority of participants did not feel that mobile technologies would be difficult to use.
- The majority of participants felt that they were competent in the use of ICTs, had good independent and collaborative learning skills.
- The majority of participants felt that accessing mobile resources would be expensive and that this may restrict their use of them.
- The majority of participants reported that they would use the mobile version of Analyse This!!!.
- Of those who would access the mobile version the majority would prefer to use this with a tutor first, and then use it on their own when needed.
- Despite participants' views on their own competencies with ICT and independent learning, responses indicate that participants had a preference for face-to-face classroom teaching and for using mobile Analyse This!!! with a tutor first before using it independently.

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