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Mobilising technology for learning





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Published by LSN

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Registered with the Charity Commissioners

Copyeditor: Jenny Warner

Designer: Joel Quartey

Printer: The Charlesworth Group, Flanshaw, Wakefield

CIMS 100103RS/08/10/2000

ISBN: 978-1-84572-972-1

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Executive summary

Overview

The aim of MoLeNET is to encourage and support the use of handheld technologies to enhance and extend the reach of teaching and learning in post-14 education and training. This process is enabled by:

- capital funding – to date this has come from the Learning and Skills Council (LSC) but responsibility for MoLeNET has now passed to the Skills Funding Agency (SFA)
- match funding – both cash and in kind – from participating institutions including colleges and schools
- an LSN support programme including continuing professional development (CPD), advice and guidance, mentoring, knowledge and good-practice sharing, peer-to-peer support and collaboration systems.

The second year of the MoLeNET initiative – MoLeNET 2 (2008/09) – has included 30 projects, each led by a further education (FE) college and some involving consortia with schools as well as colleges. In total, 48 colleges and schools were involved and 11,253 learners: 83% of whom were aged 14 to 19 and 17% of whom were aged 20 or older, with 52.3% being male and 47.7% female. The learners studied a wide variety of subjects in many contexts and at several different levels, with the largest numbers of learners studying at Levels 2 and 3. Over 2000 (2261) members of staff were also involved, 85% of them were teaching staff including teachers, mentors, assessors and learning support assistants.

Research and evaluation

Alongside and embedded in MoLeNET is the LSN MoLeNET Research and Evaluation Programme, which collects evidence of the impact of the use of handheld technologies on teaching, learning, learners, teachers and institutions, including schools and colleges. Research and Evaluation Programme activities in MoLeNET 2 were carried out by LSN's Technology Enhanced Learning Research Centre researchers, practitioner researchers trained and supported by LSN and an independent researcher commissioned by LSN.

A number of different research approaches were used to collect quantitative and qualitative data and information. Sample sizes ranged from large national samples of many thousands of learners to small class groups. Quantitative data from college management information systems (MIS) was analysed and compared with national data sets and a wealth of qualitative data provided a rich source of examples and explanations of the effects of introducing mobile technologies in many different locations and contexts. More details of the research and evaluation strategy and methods can be found in Section 4.

The heterogeneous nature of the institutions, learners, technologies, learning contexts and research methods involved in both MoLeNET 1 (2007/08) and MoLeNET 2 may encourage the view that evidence of positive impact found cannot be generalised to other groups. However, it might be argued that the very substantial numbers involved, more than 20,000 learners, the extent to which qualitative evidence supports the quantitative data and the consistency of findings across many different groups, provides some confidence to others wishing to implement mobile learning that certain benefits are likely to be accrued. These typically include increased or improved learner motivation, engagement, behaviour, retention and achievement.

The following table provides an overview of the types of research undertaken by LSN, project staff and the independent researcher.

	LSN	Projects x 30	External researcher
Quantitative research	<p>Predicted ILR data from college MIS systems benchmarked against national LSC in-year data for previous year (sample size 7636)</p> <p>SMS survey of learners</p> <p>SMS survey of teaching staff</p>	<p>Some projects benchmarked MIS data for groups of MoLeNET project learners against previous year or control groups</p> <p>Pre- and post- project m-maturity self-assessment exercise by project managers</p>	
Qualitative research	<p>In-depth, online reporting by project managers</p>	<p>30 action research projects led by practitioner researchers</p>	<p>Semi-structured telephone interviews with senior management team representatives from 41 of the 48 colleges and schools involved</p>

The programme definition of action research is:

A research approach with the fundamental aim to help professionals (including teachers and managers) to improve practice and to understand change processes, using a cyclical process to diagnose issues for investigation, plan and implement research strategies, review and reflect upon findings.

Nearly three-quarters (72%) of the projects reported that the action research approach had resulted in greater institutional change than would have otherwise occurred and 97% felt that it had resulted in better embedding of mobile learning into teaching and learning. Further reported benefits of the action research approach can be found in Section 5.

Each of the 30 projects had their own aims and objectives and these varied considerably depending on the learners involved, the learning contexts, the subjects and levels concerned, the technologies and pedagogy employed and local priorities addressed. The practitioner researchers did not all use the same research methods but chose those methods most appropriate to their projects' aims and preferences. Methods used included:

- audio and video recording
- video/audio diaries
- data collection via voting pads
- critical incidents
- focus groups
- interviews
- lesson observations
- informal face-to-face discussion groups
- questionnaires
- data traffic and access statistics
- MIS data
- virtual learning environment (VLE) feedback
- online discussion forums
- blogs, diaries and wikis
- SMS surveys and feedback
- control groups and comparison of mobile learning groups' achievements with similar groups in previous years.

Impact

Measures of the impact of MoLeNET 2 included key 'hard' indicators, i.e. levels of learner retention and achievement. This information was obtained by colleges taking part in MoLeNET 2 submitting to LSN extracts of their ILR¹ data for all participating learners. As actual results were not available in time² colleges submitted predicted outcomes for 2008/09, which were compared with LSC national in-year ILR figures for the previous year (2007/08).

This comparison suggested that there could be an improvement of 7.8% in learner retention and that there had been 6.7% fewer withdrawals. The overall achievement rate including 'achieved' and 'partial achievement' for the MoLeNET 2 sample was 13.4% higher than the previous national in-year figures and the 'no achievement' figure was less than half the national figure.

¹ The LSC collected ILR data annually from colleges in England about learners and their learning aims. Providers that receive further education, work-based learning, adult and community learning, Train to Gain or some kinds of European Social Fund funding are required to submit learner records. The ILR does not hold records on learners in schools.

² Aims and outcomes data for the ILR 2009/10 database are not finalised and released until early 2010, which was after the reporting date.

In considering this information it is important to bear in mind that:

- the MoLeNET 2 figures are based on predicted not final, actual ILR figures
- it has not been possible to control for the many factors other than the introduction of mobile learning that could have affected retention and achievement
- initiatives that involve re-thinking delivery, and particularly those that involve special attention to the personalised learning needs of specific groups of learners, are likely to lead to improvements in retention and achievement whether or not they involve new technologies.

However, the findings of research carried out at project or institution level by practitioner researchers include support for the national-level quantitative findings, see Section 7.4.

Benefits of mobile learning

MoLeNET 2 research identified a large number of benefits of mobile learning for learners, teachers and institutions. They are detailed in Section 6 together with the extent to which projects agree or disagree with them.

An obvious benefit is that technology-supported learning can take place in many different locations. Perhaps more importantly, MoLeNET 2 projects found that mobile technology ‘provides learners with choice over and ownership of their learning’ and ‘with good planning in place, mobile technologies can encourage creativity and innovation by both learners and teachers’. They can also provide ‘a safe, private and non-judgemental environment for learners to try out ideas and make mistakes in order to progress’ while taking them out of the usual learning locations and sometimes into workplaces. This enables them to support ‘real world problem-solving’, which ‘encourages the development of complex ideas and knowledge transfer’.

At an institutional level benefits include improved learner attendance, retention and achievement, plus improved communication, staff motivation and increased ability of the institution to meet learner expectations. Projects also reported ‘closer relationships between ICT and curriculum staff’ and a new ‘buzz of excitement and enthusiasm’ within the institutions.

Handheld technologies proved to be very useful for work-based and vocational learners, particularly in providing more convenient and timely access to learning resources and internet, and assisting with evidence-gathering and assessment. They have also helped to engage reluctant learners and those who have not previously thrived in educational environments.

Examples of the impact of MoLeNET 2 projects for vocational, work-based and hard to reach learners

Hastings College used iPods with work-based construction and hair and beauty learners. They reported:

The overall retention rates of learners involved in the programme was 96%. This was more than 10 percentage points higher than those not in the m-learning project.

Teaching staff were pleased with the new tools and skills acquired as a result of the project, and were convinced that the mobile devices and supporting web environment had contributed to improving engagement, attendance and retention, long before the data confirmed this.

Leeds College of Building used netbooks and mobile phones with construction learners. They reported:

Learners were able to retrieve their learning resources and produce their coursework anywhere, at any time ... were able to access research on the internet in their own home, without having to share the family computer... download work-based images taken at work from their mobile phone onto the netbook using Bluetooth for inclusion in their portfolio and use the pre-loaded resources to prepare their assessment documents for bringing back into college.

St Helens College used Sony PSPs with electrical engineering students. They reported:

Teachers' initial apprehension before the project quickly dispersed once the Sony PSPs were issued and staff could see the improvement in learner engagement' and assessors commented that 'the evidence gathered was of an excellent standard and demonstrated a more creative method of producing portfolio assessment material.

See Section 9 for more information about the impact of MoLeNET 2 on vocational and work-based learning.

Reluctant learners and young people not in education, employment or training (NEET) or at risk of becoming NEET often responded very well to the introduction of mobile technologies to support their learning.

Truro College reported:

Traditionally it would be expected that a few students would leave their course, especially students on the Level 2 post 16 First Diplomas who are at greatest risk of becoming NEET. One of the key outcomes ... was that after the issue of the mobile devices no students dropped out of any of the courses involved in the project.

Students using the devices saw their predictive grades jump far more than those not using the devices. An analysis of the final results for First Diploma Media and First Diploma IT students ... showed an increase in merits and reduction in just pass level grades. At Launceston College (a Truro partner school) subject areas produce a half-term progress statement on the achievement of students. The results revealed that 87% of the students who used their mobile device achieved higher grades than those who did not have a device.

A **Truro** teacher commented:

From my point of view the introduction of this mobile technology has made the biggest impact on my teaching in the last 10 years.

Walsall consortium used Nintendo DSs with learners including some disaffected and disengaged youths and learners with negative experiences of education. They reported:

Overall attendance for sessions on the project over the weeks was an impressive 95% – a 12% increase in a cohort which was among the most difficult to engage within a classroom environment. Learners felt that tutors made lessons more fun during the m-learning sessions, and the deputy head at the partner school stated: 'This programme has seen learners enjoying education again and the number of exclusions in Year 10 is down by 65%, this programme can certainly take some credit for this.

See sections 10 to 12 for more information about the impact of MoLeNET 2 for hard to reach, disengaged and non-traditional learners.

Handheld games technologies have been shown to be very useful for engaging and motivating younger learners in particular and, contrary to the initial fears of some staff, have led to improved behaviour rather than classroom management problems.

Learner, teacher and management voices

In response to text message surveys, 96% of learners who responded agreed that using mobile technologies had helped them, or helped them a little, to learn; 98% agreed that using mobile technologies can make learning more interesting or a little more interesting; and 95% of learners said they would like to use mobile technology for learning in the future.

In a similar survey of teaching staff, 93% of respondents felt that using mobile technology helped their students to learn, with over half reporting that it helped a lot; 91% believe that using mobile technologies can make learning more interesting; 94% agreed that using mobile technologies can help them to personalise learning; and 88% felt that the use of mobile technologies enhanced their teaching.

An independent consultancy organisation, Force4 Enterprise Limited, carried out telephone interviews with senior management representatives at 41 of the 48 colleges and schools involved in MoLeNET 2 projects.

When asked ‘What do you think about the use of mobile devices for teaching and learning?’ 100% of interviewees responded useful or very useful, with 75% stating that the technologies had been very useful. The interviewer reported:

Although we did originally ask them to limit their answers to one or two sentences, this proved impossible. The enthusiasm and the positivity were so strong that they invariably got sidetracked into details on the devices, the courses they had been applied to and the impact on success rates and retention.

When asked ‘What impact has the MoLeNET project had on your college?’ 100% of the interviewees stated that the project had had a positive effect on their institutions, with 35% stating that it had been transformational ‘in some areas’. The interviewer elaborated:

Respondents were particularly enthusiastic and positive regarding the impact it was having on student motivation, engagement and results, particularly in areas where there had been problems in the past, and amongst disengaged learners or learners with learning difficulties. Many additionally stated that there had been a complete turnaround in attitudes to mobile learning in their organisations, which in turn was influencing future strategy and was initiating a culture change.

Some examples of senior management team (SMT) interviewee comments are:

It has been transformational; the passion it has engendered in large numbers of staff and the impact on learning has been notable... understanding what the gadget is used for in a learning process has been the real move forward, not just seeing it as boxes on desks. (Accrington and Rossendale College)

It has been an outstanding success with pupils in this field. It has increased enthusiasm and it has improved success rates. The handheld devices have been outstandingly useful and they've added a new dimension to teaching. (Fowey Community College)

In relation to the level of first entry learners, we had a drop-out rate before we got these devices, but after using these devices we did not have drop-out but it's hard to analyse whether it was because of the devices. (Leeds College of Building)

For us the biggest impact is almost collateral in terms of raising the profile of practical science into something which is truly exciting and accessible and supported and... for students of all ages, even ones who seemed a bit resistant to it, their success rate has gone up really quite dramatically. (Capel Manor College)

Teachers have reported improved quality of work; work completed quicker than before; improvements in collaboration and behaviour; increased motivation and learners finding aspects of the curriculum easier to access (Chichester College)

It has had the biggest impact on retention, and success as a factor is obviously influenced by how many people you retain and how well they achieve... because they're so active in their learning, want to be involved and the motivation factor has gone up tenfold. (Exeter College)

The construction department which was part of the project, was re-inspected. It was on a Grade 4 in May 2008 and is now a Grade 2, so gone from adequate to good in part due to the technological advancements and mobile learning elements of the course. It's been transformational for learners and staff and created a lot of excitement around the college of which we've been very proud and the results speak for themselves. (Hastings College)

It's been a revolution over the last three years of being involved in MoLeNET and using mobile technology. We have learners now that, if it hadn't been for the development of mobile technology, would still be reliant on support... Learners with learning difficulties and disabilities learn to be more autonomous learners through the use of mobile technology; in a learning context, in work in the community and in their learning environment. (National Star College)

We've got no doubt that the use of mobile technology has a positive impact on teaching and learners and have no doubt it will be a key element in where we want to go with the college over the next five years. I don't think that mobile learning technology will 'go away' and I think they're only likely to increase and develop and we do see mobile learning technology as a good way of helping our development of blended learning. (Cornwall College – St Austell)

See Section 17 for further details.

Distance travelled or m-maturity

MoLeNET 2 project managers carried out a self-assessment exercise at three stages (pre-project, during the project and post-project) to assess the distance they had travelled towards embedding mobile learning. This was done by considering the attitudes and behaviour of senior management, teaching staff, IT staff and the whole institution, and positioning these on a five-point scale by selecting the statement most closely matching their circumstances. For example, for senior management the five statements were:

1. SMT are not interested in mobile learning.
2. SMT are interested in mobile learning (e.g. exploring funding opportunities).
3. SMT are actively supporting and engaging with initial implementation of mobile learning (e.g. via a MoLeNET project).

4. SMT have a strategy for extending mobile learning to more departments in the future.
5. SMT have a strategy embedding mobile learning into delivery across the institution.

Analysis of the m-maturity data found overall improvements in levels of m-maturity across all four areas. SMTs and then IT departments showed the highest levels of m-maturity at the end of the year; however, the institution as a whole and then teaching staff had travelled the greatest distance. See Section 16 for more details.

Sustainability

All MoLeNET 2 projects were tasked with considering how mobile learning can be sustained and expanded in a future in which substantial sums of additional public sector funding are unlikely to be available.

In contrast to a previously widespread attitude, in schools in particular, that learners' own mobile technologies were a problem; the most popular strategy for sustainability was 'encouraging and enabling learners to use their own technologies'. Over 80% of projects also agreed that 'improving the range and/or capacity of wireless networks' was necessary, as well as 'more investment in mobile technologies by schools and colleges', with over 60% supporting 'switching some school/college investment from desktop to mobile technologies'.

Barriers to sustainability identified included the problem of 'the speed at which mobile technologies become out of date'; human and process factors. For example:

Relationships between tutors, learners and IT staff need to be further developed so that productive debates can be had over issues such as security, curriculum-planning and delivery, resource development, establishing authenticity of work and fitness for purpose of IT infrastructure. (Stoke on Trent College)

The main barrier to sustaining mobile teaching and learning [is] the amount of time involved in training and supporting staff and for teachers themselves to develop their delivery to include effective mobile learning. (Wirral Metropolitan College)

For more information see Section 19.

A final word from a MoLeNET 2 project

When asked for any further comments about MoLeNET 2 one senior manager said:

It's been almost like having a new baby! The most wonderful, exciting journey and, at times, the most tiring and frustrating. The afterglow is that we've created something that will continue to grow and become more stable and more embedded within our normal culture of delivery. (Trafford College)

1 Introduction

Early in 2007 the Learning and Skills Council (LSC) decided that handheld and wireless technologies and the concept of mobile learning were well enough established, and the potential benefits of mobile learning sufficiently clearly indicated, to justify investment in a significant implementation of mobile learning within the English further education (FE) sector.

As a result the Mobile Learning Network (MoLeNET) was established, with the LSC making available £6 million of capital funding in the 2007/08 financial year for shared-cost mobile learning projects.

Participating colleges and schools made in-kind contributions of staff time and a financial contribution equivalent to 20% of the capital provided for their project to fund the LSN Support and Evaluation Programme. This was developed to:

- assist participating colleges and their partners in implementing mobile learning
- provide continuing professional development (CPD) for staff involved
- support mobile-learning expertise capacity-building
- work with practitioners and their institutions to assess the effectiveness and impact of the initiative and the projects.

Following the success of the first year of MoLeNET, which involved over 10,000 learners and was described in Attewell, Savill-Smith and Douch (2009), the LSC decided to make available a further £4 million of capital funding in 2008/09 for MoLeNET 2 mobile learning projects. The new projects (see figure 1 for a list and Appendix 1 for project summaries) ran from November 2008 to July 2009 with some activity in September and October 2009 to produce case studies focusing on specific applications of mobile learning.

LSN researchers and practitioner researchers, supported and trained by LSN, carried out research throughout phase 2. This publication highlights key findings from this research and from an independent survey of senior management.

Where practitioner research findings are reported these are from 29 of the 30 MoLeNET 2 projects as one of the projects did not submit their reports and data in time to be included in analysis.

Figure 1 MoLeNET 2 projects and lead partners

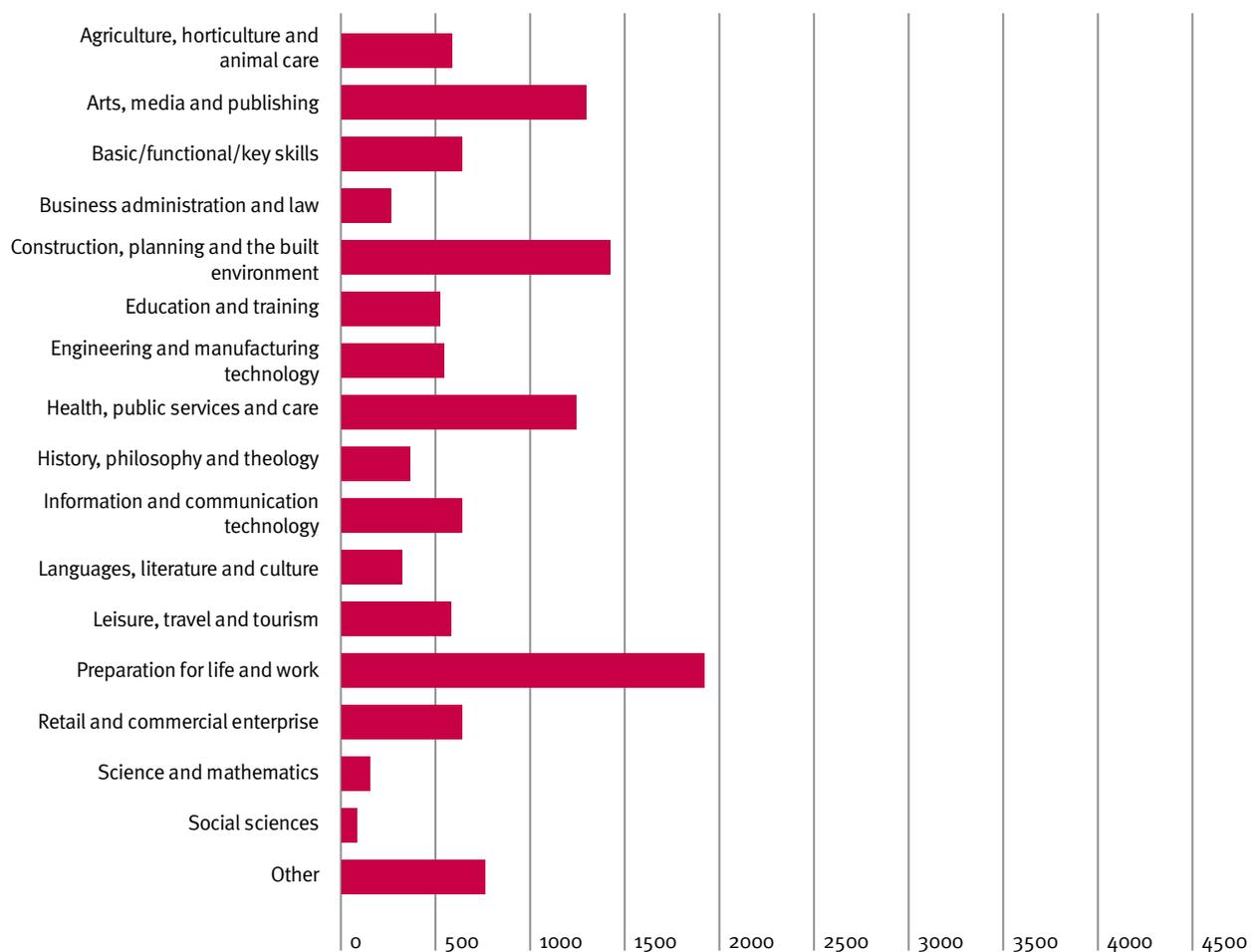
Project title	Lead partner name
Innovating and Embedding Mobile Learning Technology to Create a Sustainable, Whole College Approach to m-Learning with Positive Impact on Retention and Success	Accrington and Rossendale College
Learning in the Mobile World	Ashton Sixth Form College
Mobile Works!	Aylesbury College
Implementing Personalised Accessible Learning (i-PAL)	Bolton Community College
Use MoleTec to Better Respond to Employers and Engage with Learners	Bridgwater College
MoLeNETfor Moles, Bats, Bees and Trees	Capel Manor College
Keys for Opening Doors	Chichester College
Embedding MoLeNET Across Cornwall (EMAC)	Cornwall College
Making the Foundation Tier Mobile	Ealing, Hammersmith and West London College
FLIP IT – Moving Industry Into The Classroom and the Classroom into Industry	Exeter College
Shiny – Mobile Assessment at Gloucestershire College	Gloucestershire College
Connect to Succeed	Grimsby Institute of Further and Higher Education
WILMA (Work-based Individualised Learning through MP4 Applications)	Hastings College
mBuild	Joseph Priestley College
The Use of Mobile e-Learning in Relating Historical and Theoretical Study with Practice in the Study of Art and Design	Leeds College of Art and Design
m-Ludlow	Ludlow College
Open Access Key Skills	Moulton College
Redbridge College PEP Talk – Personalisation, E-Portfolios and Podcasts	Redbridge College
Using Podcasting and Vodcasting to Personalise Learning and Revision for Students	Reigate Sixth Form College
LIFEWISE – Using Mobile Technology to Fight Gang, Gun and Knife Crime	South Thames College
SMiLE@SHC (Supporting Mobile Learning at St Helens College)	St Helens College
mStoke (mobile Stoke)	Stoke on Trent College
Embedding Mobile e-Learning Technology to Facilitate Teaching and Learning in Demanding Physical Environments	The College of West Anglia
Preparing for Independence, Progression and Employability using mobile learning(PIPE)	The Manchester College
M-learning – A Tool for Transformation in Sheffield (MATTS)	The Sheffield College
Establishing Mobile Learning as a Sustainable Student Entitlement to Improve Literacy Levels across East London	Tower Hamlets College
Move Ahead Mobile	Trafford College
Using Mobile Technology to Push and Pull Learning to Learners in a Sparse Rural Area and to Learners Working Outside a Traditional Classroom Environment	Truro College
MoLeNET at Walsall College Molenet	Walsall College
Employability	Wirral Metropolitan College

2 The learners, staff and projects

In total, 11,253 learners were involved in MoLeNET 2. 83% of these learners were aged 14 to 19 and 17% 20 years and over. They studied a wide variety of subjects (see figure 2) at several different levels (see figure 3). Most learners were studying at level 2, closely followed by level 3.

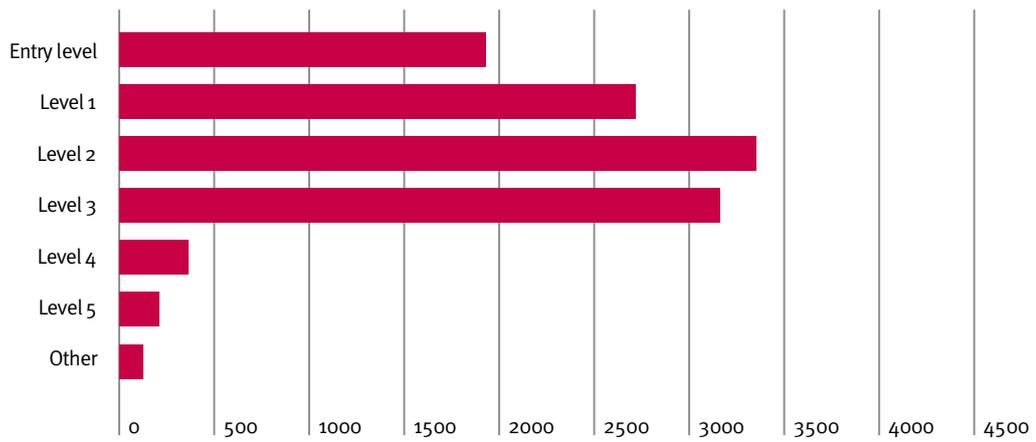
A total of 2261 staff were involved in MoLeNET 2, 85% of them were teaching staff, including teachers, mentors, assessors and learning support assistants. The projects addressed a variety of national and local priorities as illustrated in figure 4.

Figure 2 Number of MoLeNET 2 learners by programme area



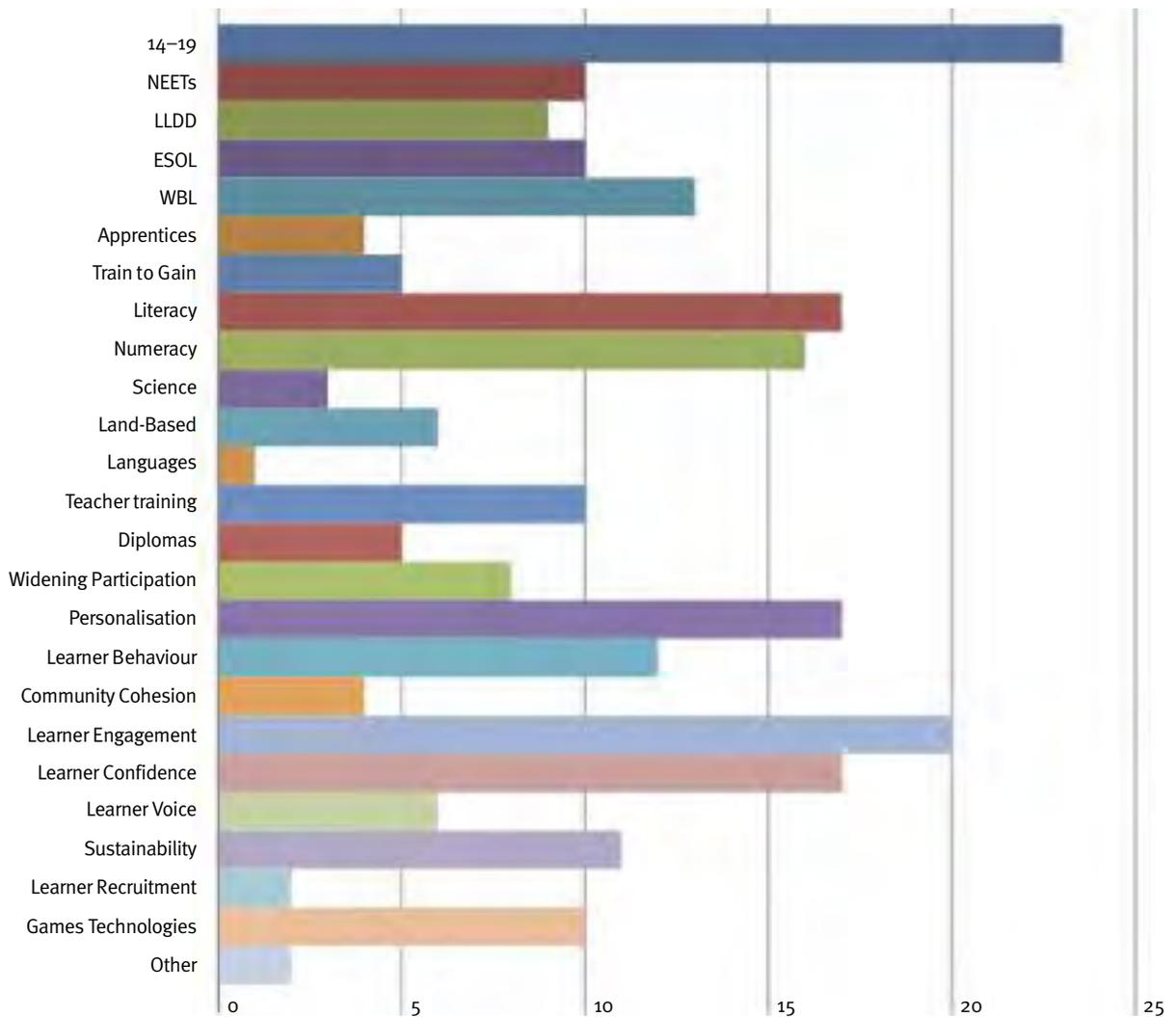
(note: some learners used handheld technologies for more than one subject)

Figure 3 Number of MoLeNET 2 learners by level of study



(note: some learners used the handheld technology at more than one level)

Figure 4 MoLeNET 2 projects priorities

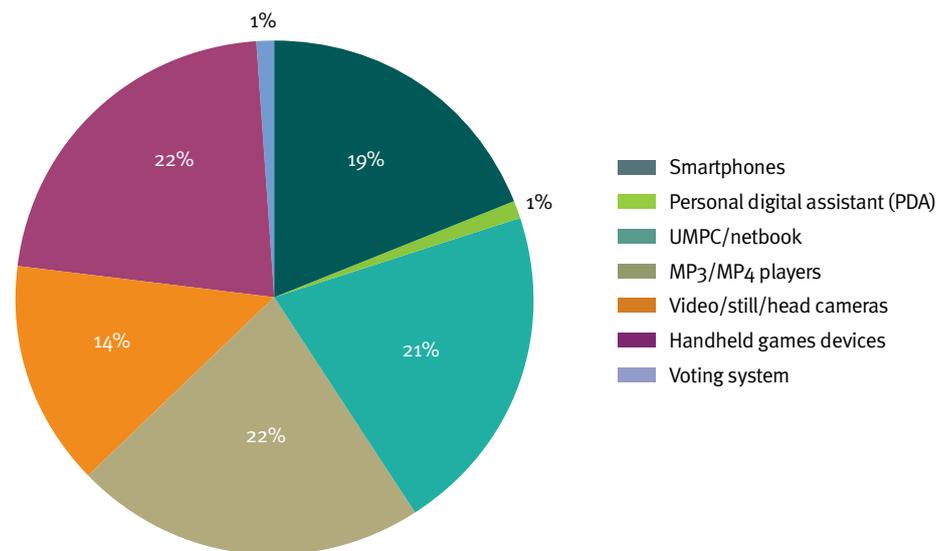


3 Handheld technologies and their use to support learning

MoLeNET 2 projects purchased over 10,000 individual items of handheld technology. They also purchased infrastructure technology to provide or enhance networks and services to be accessed by mobile technology users.

A wide variety of handheld technologies were purchased. Some projects concentrating on just a few types, while others deployed a range of technologies to support diverse learner groups. Figure 5 summarises the handheld technologies purchased. The percentages indicate the proportion of the total number of devices purchased not the proportion of the total cost.

Figure 5 MoLeNET 2 handheld technologies purchased



How the handheld technologies were used to support learning and learners varied according to the learners involved, the learning context and location, the preferences of learners and teachers and the functionality of the technology. Figure 6 shows which handheld technologies were used to support specific learning activities.

Figure 6 How handheld technologies have been used to support teaching and learning

	Smartphones (inc iPhone)	UMPCs/Mini note/netbooks	PDA's	Nintendo DS	Sony PSP	MP3/MP4/ Media players	iPod Touch	Voting systems	Specialist ³ handhelds	Camera and headcams
Individual study	●	●	●	●	●	●	●		●	●
Group work	●	●	●	●	●	●	●	●	●	●
Whole class work	●	●	●	●	●	●	●	●		●
Data collection										
On field trips	●	●	●		●				●	●
In lab/workshop	●	●	●		●				●	●
In workplace	●	●	●		●				●	●
Access to internet				●	●					
On field trips	●	●	●							
In lab/workshop	●	●	●	●	●		●			
In workplace ⁴	●	●	●	●	●		●			
At home	●	●	●	●	●		●			
Around college/school	●	●	●	●	●		●			
In transit	●	●	●							
Recording activities/ coursework for review	●	●	●		●				●	●
Creating learning materials for others	●	●	●		●		●			●
Recording reflections/ diaries	●	●	●		●		●			
Collecting evidence for assessment										
In workplace	●	●	●		●				●	●
In college/school	●	●	●		●				●	●
Remote learning										
Text-based (inc ebooks)	●	●	●	●	●		●			
Multimedia, inc audio/video	●	●	●	●	●	●	●			
Interactive learning	●	●	●	●	●		●			
Revision	●	●	●	●	●	●	●			
Skills practice	●	●	●	●	●	●	●		●	
Formative assessment	●	●	●	●	●	●	●	●		
Feedback/questions to teacher	●	●	●	●	●		●	●		
Communication from/ to the teacher	●	●		●	●		●			
Peer-to-peer communication/support	●	●		●	●		●			
Reviewing knowledge	●	●	●	●	●	●	●			
Warm up/cool down exercises	●		●	●	●		●	●		
Breaks or rewards				●	●	●	●			

³ Including scientific, agricultural and environmental handheld equipment⁴ Workplaces including shops, salons, care homes, factories, farms, schools (trainee teachers), etc

4 Seeking evidence of positive impact and good practice

The main research and evaluation strand of the MoLeNET Support and Evaluation Programme aimed to investigate:

- how colleges and consortia partners use handheld technologies to improve teaching and learning
- the impact of mobile learning on learners, teachers and institutions
- whether mobile learning can help to improve ‘hard’ indicators of success such as learner retention and achievement.

The research and evaluation strategy developed (see figure 7) recognised that each of the 30 projects had its own aims and objectives, which varied considerably depending on the learners involved, the learning contexts, the subjects and levels concerned, the technologies and pedagogy employed and local priorities addressed. Therefore the research and evaluation strategy had at its heart 30 practitioner-led action research projects, the findings of which fed into a comprehensive national evaluation, with several different components.

The programme definition of action research is:

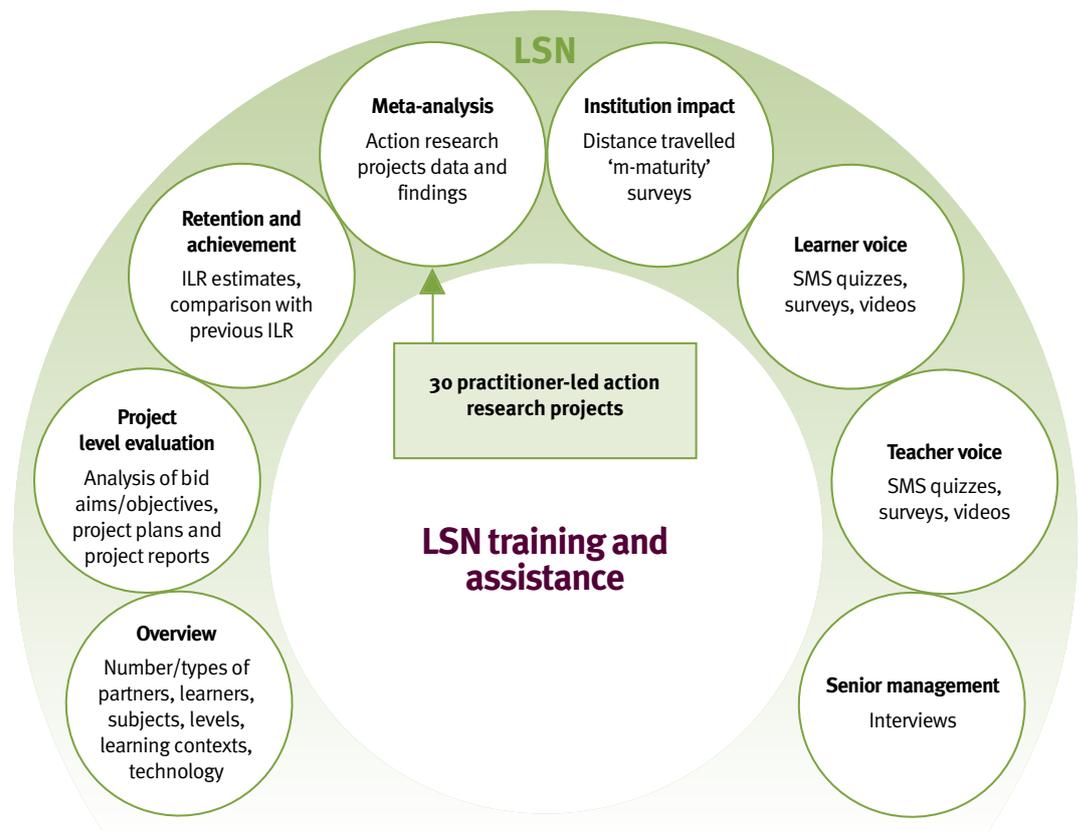
A research approach with the fundamental aim to help professionals (including teachers and managers) to improve practice and to understand change processes, using a cyclical process to diagnose issues for investigation, plan and implement research strategies, review and reflect upon findings.

The heterogeneous nature of the institutions, learners, technologies, learning contexts and research methods involved in both MoLeNET 1 (2007/08) and MoLeNET 2 (2008/09) may encourage the view that evidence of positive impact cannot be generalised to other groups. However, it might be argued that the substantial numbers involved – more than 20,000 learners, the extent to which qualitative evidence supports the quantitative data and the consistency of findings across many different groups, provides some confidence to others wishing to implement mobile learning that certain benefits are likely to be accrued. These benefits typically include increased or improved learner motivation, engagement, behaviour, retention and achievement.

Each project nominated a lead practitioner researcher (LPR) for whom LSN provided action research and research methods training. LSN researchers worked with the LPRs helping them to refine their action research plans to ensure that the research was directly relevant to their projects and the methods chosen were practical and appropriate.

LSN researchers visited the projects and provided further training, assistance and advice on data collection and analysis. A Moodle course enabled sharing of knowledge and materials as well as discussion and online support.

Figure 7 MoLeNET 2 research and evaluation strategy overview



As illustrated in figure 7, in addition to training and supporting practitioner researchers, LSN researchers employed a variety of research methods to consolidate and complement local research activities including:

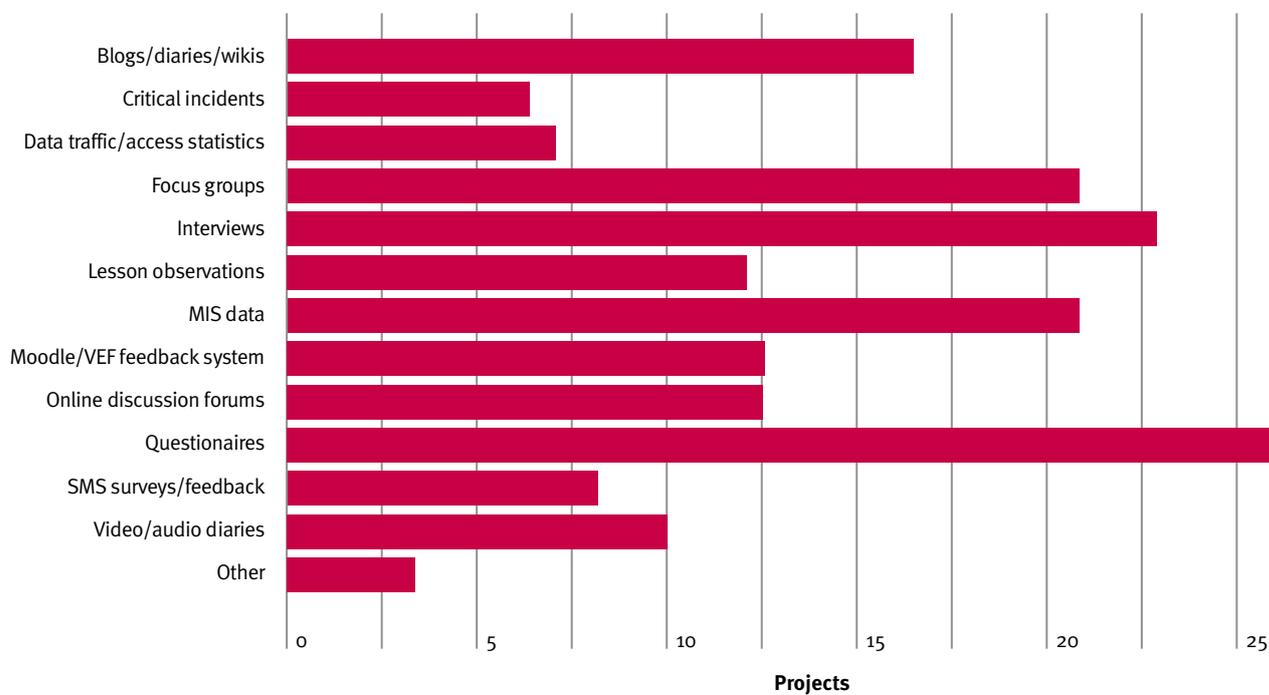
- quantitative analysis of the predicted Individual Learner Record (ILR) data provided for learners taking part in MoLeNET 2 and comparison of these with LSC in-year data for the previous year (see Section 7).
- SMS surveys of learners and teachers (see Section 15).
- pre- and post- project completion of an m-maturity survey by project managers to assess distance travelled in implementing and embedding mobile learning (see Section 16).

LSN also commissioned an independent research company to carry out telephone interviews with senior management at participating colleges and schools (see Section 17).

4.1 Research methods used by the projects

Projects were asked what research methods they used in their action research (see figure 8).

Figure 8 Practitioner research methods



Other research methods used by the projects included informal discussions, audio and video recording and data collection via voting-pad systems.

Projects were asked to comment on the usefulness of the different methods.

Blogs/diaries/wikis

Although some projects reported that blogs and wikis helped staff and students to note thoughts and ideas, share information and provide feedback, most projects found the response rate disappointing. Reasons for this included lack of time to post entries, lack of skills or knowhow, technical challenges and preference for familiar recording mechanisms such as Microsoft Word or personal blogging sites not known to the college.

Critical incidents

Five projects commented on the usefulness of critical incidents as a research tool for stimulating and sharing new ideas and approaches to mobile teaching and learning, feeding back on what did and did not work well, capturing unexpected and unplanned events and outcomes, and helping mobile learning to move forward.

Data traffic/access statistics

Projects using this data collection method generally found it useful for gathering reliable statistics relating to virtual learning environments (VLE), WiFi and device usage, access to online resources and other activities. One project mentioned, however, that it was difficult for tutors to access this information, and another commented that the number of Moodle courses involved made using the statistics effectively very difficult.

Focus groups

Projects wrote very positively about the use of both staff and learner focus groups, saying that they produced large amounts of good qualitative data. Teachers/learners giving feedback in groups as opposed to one to one were more willing to participate; felt more relaxed and at ease; were able to share concerns, debate issues and discuss what had and hadn't been successful as well as requirements and ideas for the future. Less confident individuals tended to get more involved, as they were prompted by other people's comments, and in general the discussion provided in-depth information as participants responded to each other's comments.

One project mentioned that focus groups were useful for identifying which opinions were clearly fully supported and which depended on context. Several projects reported that focus groups' ability to support quantitative data was valuable and enabled questionnaire responses to be expanded on and reasons for responses to be discussed in detail. Participants found this more informal data collection strategy enjoyable and projects mentioned that it was good for participants to feel part of a group and find solutions to general problems by sharing experiences. Feedback from focus groups helped to guide the direction of the projects and future developments.

Two difficulties with focus groups were mentioned:

- they can be difficult to organise across different groups of learners
- the amount of data gathered can be difficult to manage, particularly if full transcripts are required.

Video recording focus groups can also provide a mass of data, although it takes time to analyse.

Interviews

Projects that used interviews as a research tool were generally very pleased with the results. They found this method particularly useful for collecting in-depth and specific information, comments, concerns and explanations, as well as success stories, frustrations and breakthroughs. Although they could be time consuming and sometimes difficult to organise, the interviews enabled both learners and staff to provide detailed responses much more quickly and easily than if they were asked to write down answers and gave rise to opportunities to expand on answers, probe for deeper meaning and tease out issues for immediate response or later follow up.

Many projects used semi-structured interviews, sometimes building on questionnaire responses and sometimes giving interviewees the questions to consider beforehand, but either way it was felt that interviews provided participants with a chance to explain unexpected outcomes and to deviate from the question to elaborate on important findings and insights. Sometimes more informal interviews were used as it was felt that interviews could be intimidating, especially for learners, and could promote biased responses if interviewees felt there was a 'correct' response. Informal, ad-hoc interviews allowed learners and staff to provide immediate feedback before the experience became distorted or forgotten. Interviews sometimes became too personal but discussing the broader context helped to make sense of different responses. It was felt that it was important to develop a good rapport with the interviewee to encourage detailed responses and honesty.

Lesson observations

Lesson observations were considered to be a useful way to gather information about how teachers and learners are actually using the handheld devices, the impact of this on programme delivery, the skills learners are using and the interactions. Staff were also able to gather immediate informal feedback from staff and learners during such observations.

Formal observations, although sometimes obtrusive and uncomfortable for the teacher/tutor, were very useful for gathering recorded, formalised, auditable data of comparisons across learning contexts. This type of observation also provided an opportunity to recognise the teacher's efforts and the value of handheld technologies.

Informal observations were seen as a good way to capture evidence in natural surroundings, which could then be discussed further during interviews.

It was felt that lesson observations provided opportunities for staff to be given feedback, facilitating continuous improvement and allowing the action research cycle to progress naturally.

Management information systems data

Projects mostly agreed that management information systems (MIS) data could provide easily accessible, accurate and factual data about student performance. Comparisons could quickly be made between year groups, courses and users/non-users of handheld devices, and historical data was readily available. However, generally projects felt that this kind of data was only useful alongside other research methods because it could not provide any insight into the nature of the impact and the experiences of the staff and learners. In one case it was felt that the data did not add anything new to what had already been established by other methods, and in other cases it was felt that the data wasn't always meaningful or complete, and the impact of factors other than mobile learning on performance data was not factored in.

VLE feedback systems

Projects used VLEs (Moodles most often in FE colleges) to gather feedback through online questionnaires, feedback forms, blogs and forums. This was more successful for some projects than others. Some reported that participants were able to provide feedback via their handheld devices on problems, concerns, discoveries, activities, training needs, uses of devices, perceptions of mobile learning, etc. Others noted that there could be a delay between a significant incident and blogging a response, that because blogs are written they can sometimes be rather stilted and that encouraging responses to online surveys and blogs can be challenging.

In addition to feedback, VLEs have been used to store documents, resources and links and the automatic statistics have provided information relating to access.

Online discussion forums

Projects have set up discussion forums to stimulate discussion about certain subjects, collect feedback, allow sharing of experiences, findings, progress and critical incidents, enable discussion of training requirements, obtain technical support and share good practice.

Most projects, however, found that contributions to the forums decreased with time and sometimes stopped altogether. Possible reasons included lack of time, preference for email or face-to-face discussions and lack of technical knowhow. Although one project suggested that a forum could be much easier to manage than a chat-room facility, another pointed out that if a lot of contributions are made it can be very time-consuming to read and analyse them.

Questionnaires

Most projects considered questionnaires a quick and easy way to gather large amounts of (mostly quantitative) data from learners and staff. Analysis was often simple, particularly where online questionnaires with built-in analysis tools were used. They provided clear and easy-to-understand data that could reveal attitudes and opinions both before and after using handheld devices, thus giving a clear indication of distance travelled and changes or impact (though too short a time gap between the two could be an issue). Specific questions can be asked to ensure information gathered will answer the research questions and, if short and simple, questionnaires are quick and easy to complete. Information from the questionnaires could also be combined with data from other research techniques to create a detailed picture.

On the downside, many projects found questionnaires rather limiting in that they were excellent for quantitative data but less good for detailed experiences, insights and explanations. Some projects found that questions were misinterpreted or not understood and some learners could not complete them because of low levels of literacy. Also, in some cases the questions used were only appropriate for a particular context, so were difficult for some respondents to answer.

Finally, some projects mentioned disappointing response rates and suggested handing out paper copies of questionnaires directly to participants for immediate completion or tying in completion with the handout of devices.

SMS surveys/feedback

Most projects that had used SMS surveys/feedback to collect data were referring to the LSN SMS quizzes. The few projects that used this method for their own data collection felt that it was quick and relatively easy, and could provide information to support other findings, but that generally response rates were very low and only short responses could be collected.

Video/audio diaries

The feedback for this research method was mixed: some projects found that video/audio diaries were useful reflection tools for staff and learners, capturing information for later reference or course evidence; others felt the feedback captured was limited and possibly distorted by the fact the participant was being recorded on camera.

Videos of teacher and learner feedback can be found at www.moletv.org.uk.

Other

Voting pads: **Stoke** on Trent found voting pad systems useful in collecting data from groups of students (as well as for assessment purposes) particularly during outreach work.

Informal discussions: **Capel Manor** reported that in the absence of focus groups (due to workload issues) informal discussions were an easy way to collect staff perceptions and feedback. They did recognise that this was not the most reliable method.

Audio and video recordings: **Aylesbury** used audio and video recordings, which allowed them to review and reflect on data.

Some projects compared control groups of learners who were not using handheld technologies with groups who were using these technologies provided by their MoLeNET 2 projects (e.g. **St Helens**). In other cases practitioner researchers compared current mobile-using groups of learners with similar groups in previous years when the handheld technologies were not available (e.g. **Capel Manor**).



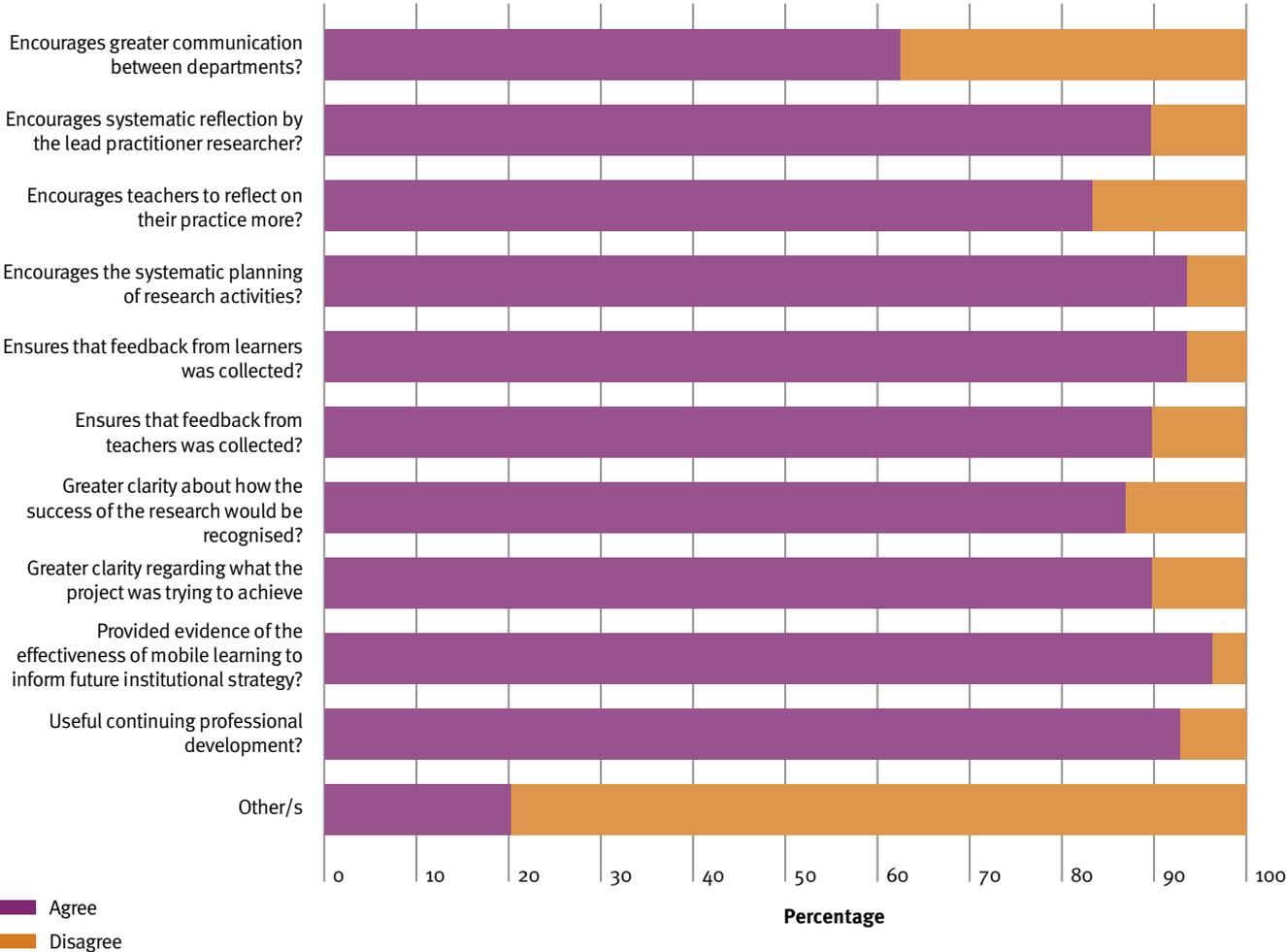
5 The impact of action research

Projects were asked whether the requirement to carry out action research had resulted in greater institutional change and/or better embedding of mobile learning into teaching and learning than if MoLeNET had only provided equipment and some training in how to use it.

Nearly three-quarters (72%) of projects felt that the action research had resulted in greater institutional change, and 97% felt that it had resulted in better embedding of mobile learning into teaching and learning.

While reflecting on their action research many practitioner researchers commented that the process had delivered significant benefits as well as contributing to embedding mobile learning into practice and making continuation beyond short term funding more likely. Researchers summarised these benefits by answering a series of questions as illustrated in figure 9.

Figure 9 The benefits of action research



Additional benefits of using the action research approach included:

- ‘provided a true indication of the time investment required from various departments’
- ‘provided opportunities to raise the profile of mobile and technology enhanced learning’
- ‘enabled trainee teachers to become involved with the CPD centre at an early stage of their professional development’
- ‘given teachers and learners opportunities to discuss issues related to integrating ILT into lessons’
- ‘helped to identify good practice’.

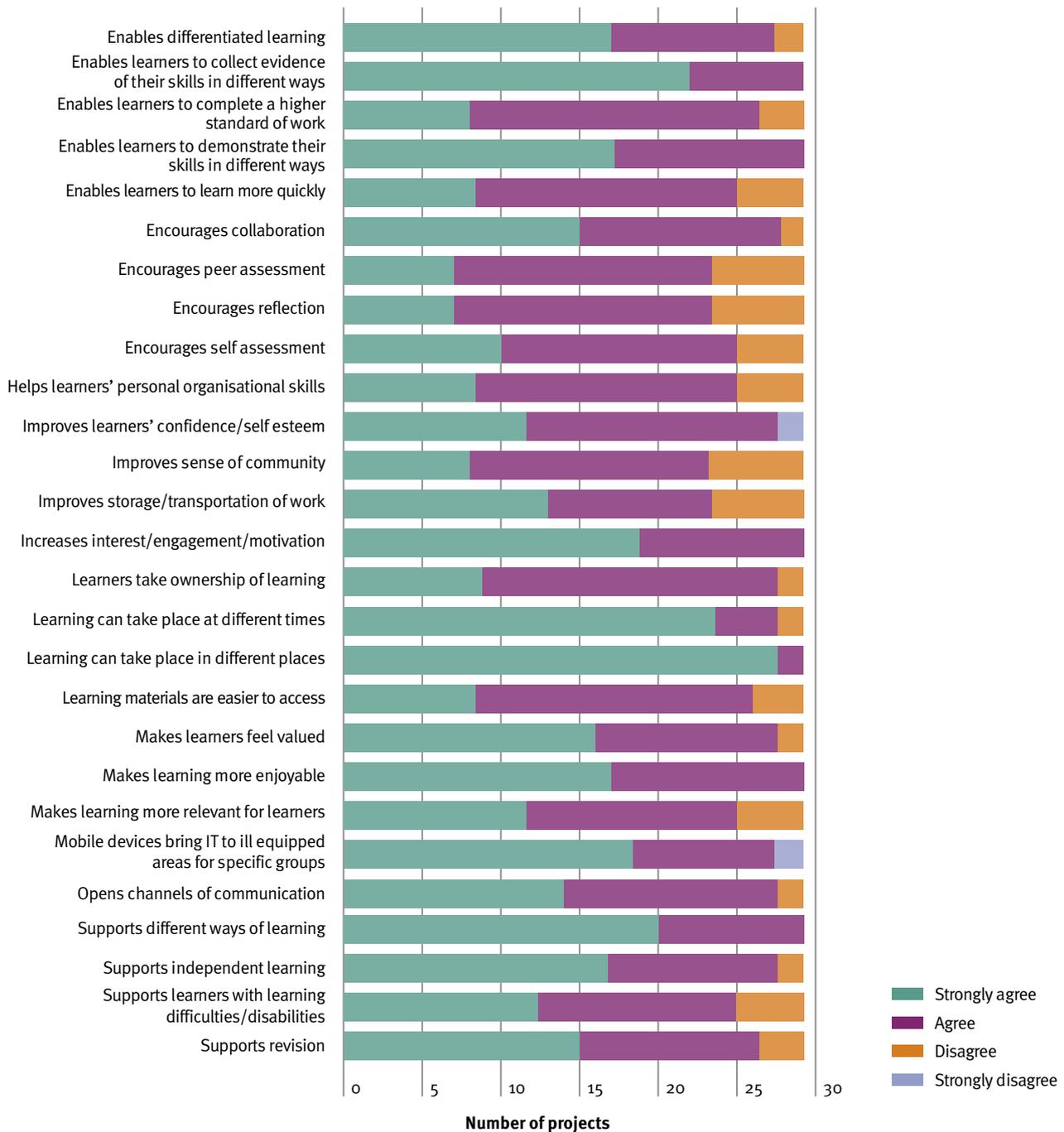
One project reported that collaborating with a partner organisation to carry out action research helped with sharing experiences and strengthening the partnership. Another noted that closer relationships had been developed between staff working in different curriculum areas or at different levels in the college hierarchy. Recognition of the benefits of action research at **Walsall College** resulted in them setting up a research and innovation capability in the college:

Staff will be encouraged to carry out pedagogically focused research projects. This unit will also be responsible for the dissemination and cascading of the knowledge gained, so that the College can make informed and educated decisions regarding future strategic investment.

6 The benefits of mobile learning

Project managers, drawing on the experiences of the 11,252 learners and 2261 staff involved in MoLeNET 2 projects, have reflected upon the benefits of mobile learning and indicated the extent to which these have been realised (see figures 10 to 12 which include the responses of 29 of the 30 project managers).

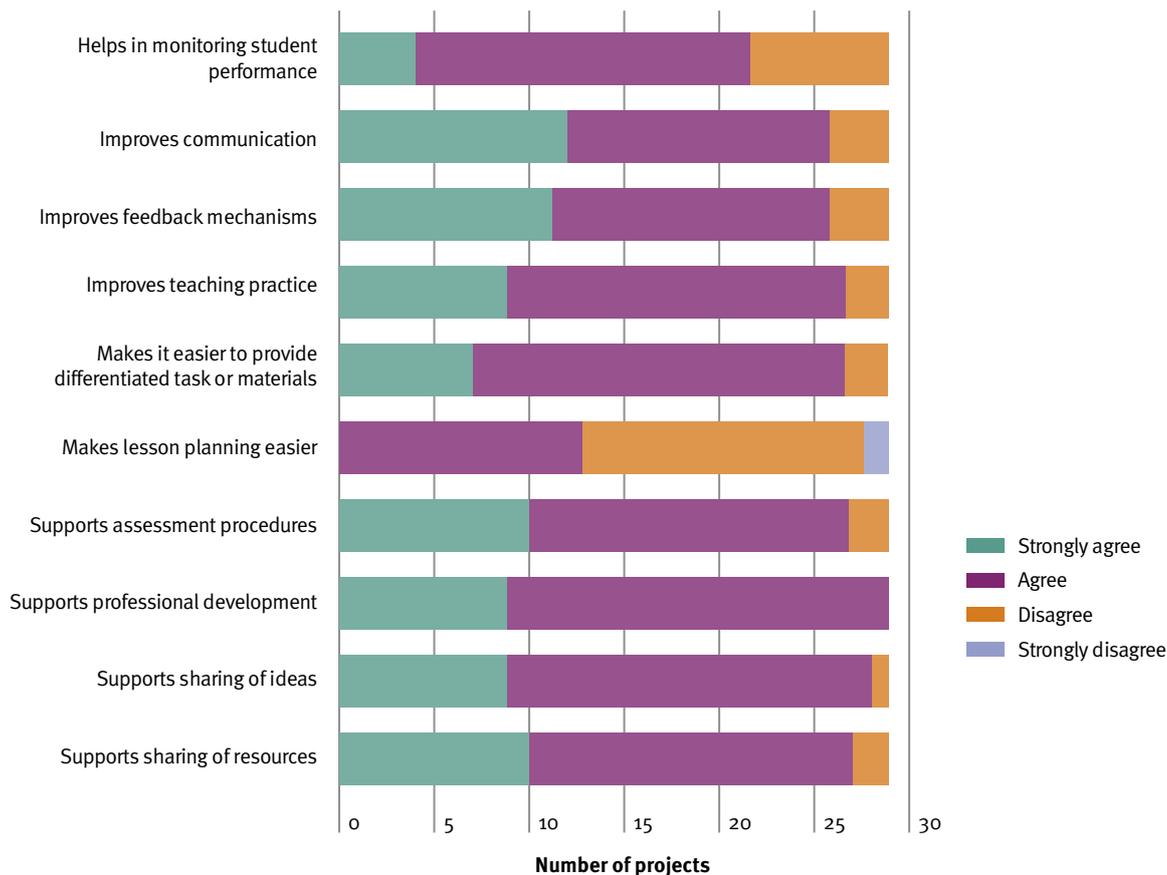
Figure 10 The benefits of mobile learning for learners



Other benefits for learners reported by the projects included:

- encouraging creativity and innovation by both learners and teachers
- transforming learners from passive recipients of information to active constructors of knowledge
- more choice and more feelings of ownership of learning
- allowing learners to become teachers and encouraging peer-to-peer support
- interactive activities and real-world problem-solving encouraging the development of complex ideas and knowledge transfer
- a safe, private and non-judgemental environment for learners to try out ideas and make mistake in order to progress
- improving employment prospects for learners as they develop specific technology knowhow and transferable skills
- improving learner behaviour and attitudes
- reducing language barriers for learners of English for Speakers of Other Languages (ESOL).

Figure 11 The benefits of mobile learning for staff

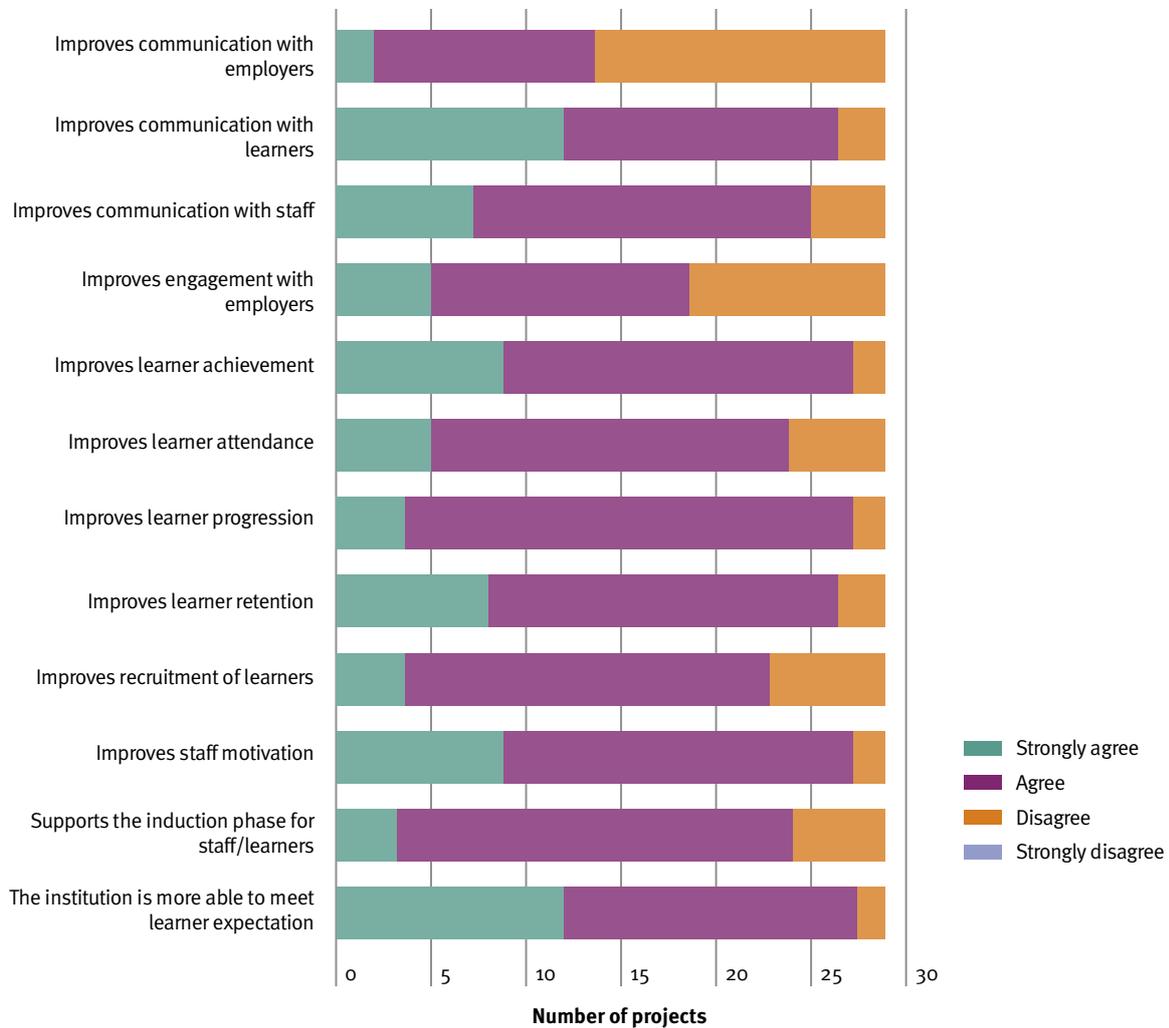


Other benefits for staff suggested by the projects included:

- given appropriate staff development activities teachers would not be restricted by traditional timetabled sessions and would be able to choose a particular device and develop teaching tools and resources specific to an individual learner’s needs

- greater flexibility and scope when planning and delivering lessons
- encourages staff to experiment with different ways to support learners
- improved relationships between tutors and learners
- allowing some basic tasks to be completed more efficiently so that time can be spent on more interesting and challenging activities
- enabling teachers to broaden their range of skills and understanding of teaching tools and possibilities
- improved confidence in e-learning
- enabling delivery in the outdoor environment, which was not previously possible
- automatic collection of data by devices reducing the need for some specific activities to ‘test’ students.

Figure 12 The benefits of mobile learning for institutions



Less than half of the projects agreed that introducing mobile learning improved communication with employers. There could be many explanations for this but less than half of the projects involved work-based learning (WBL) and respondents did not have a ‘not applicable’ option when responding.

Other benefits for institutions suggested by the projects included:

- closer relationships between ICT and curriculum staff, which will help make mobile learning even more successful in the future
- staff satisfaction improved as a result of sharing of good practice and valuable CPD opportunities, and changing the culture of the institution
- WiFi access enabling students to work during break times on their own devices and enabling the institution to keep up with demand for access to the internet
- a positive group culture for learning and sharing
- institutions being able to see the potential in learners' own devices, such as their mobile phone, and review policies on their use in the classroom
- improved perception of the institution by current and perspective students
- a buzz of excitement and enthusiasm around the institution.

One project emphasised that MoleNET not only enabled investment in the institution in terms of technologies and infrastructure but also enabled investment in its staff including project management and practitioner research training. Two other projects highlighted the opportunities for collaboration, sharing, developing shared understanding and networking that their projects have provided.

7 Learner retention, achievement and progression

The data collection process

Colleges taking part in MoLeNET2 submitted extracts of their predicted Individualised Learner Record (ILR)⁵ data for participating learners to LSN. The data were predicted rather than actual as actual results were not available in time.⁶ Discrepancies between predicted and actual outcomes should be reduced by collecting this data from experienced practitioners who had direct contact with learners and were familiar with their performance and progress.

Benchmarking

The MoLeNET 2 predicted retention and achievement rates were compared with the LSC national in-year ILR figures for the previous year (2007/08).

The sample

ILR data was provided for 10,719 learners with a fairly equal division between males (52.3%) and females (47.7%); the highest proportion of learners were registered as studying at level 3 (30.9%) followed by level 2 (27.3%) and level 1 (24.1%).

However, reviewing the data established that one college had provided ILR data for all their learners (3083 learners), arguing that all had to some extent been affected by the introduction of handheld technologies as part of a whole-college ICT strategy. The LSN research team concluded that this approach might have resulted in the submission of data relating to many learners who might have had very little exposure to mobile learning. As it was not possible for the team to distinguish and exclude just these learners. Therefore, in order to optimise the reliability of the results and reduce possible bias, this college's data was excluded from the sample and the research team requested that they provide more specific data for future analysis. The analyses in this report are therefore based on a sample of 7636 learners.

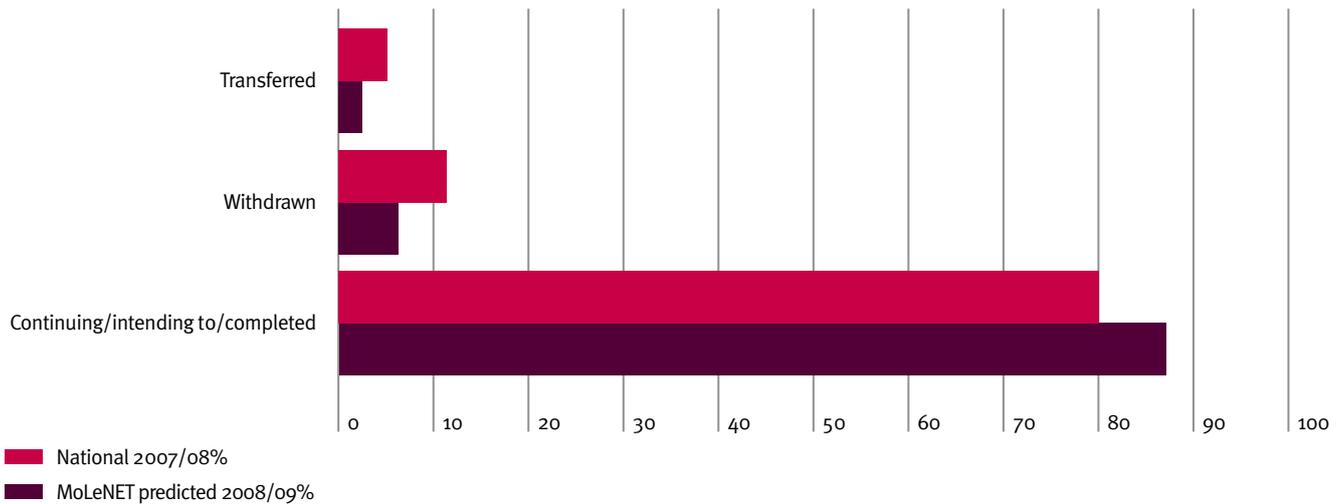
⁵ The LSC collected ILR data annually from colleges about learners and their learning aims in England. Providers that receive further education, work-based learning, adult and community learning, Train to Gain or some kinds of European Social Fund funding are required to submit learner records. The ILR does not hold records on learners in schools.

⁶ Aims and outcomes data for the ILR 2009/10 database are not finalised and released until early 2010, which was after the reporting date.

7.1 Retention

As LSC national 2008/09 retention rate figures were not available at time of analysis for comparisons, the previous year (2007/08) LSC national in-year figures for the 16–18 learner population in all FE sector colleges were used. This comparison suggests an improvement in learner retention of 7.8% and 6.7% fewer withdrawals (see figure 13).

Figure 13 MoLeNET 2 learner retention compared with national previous year



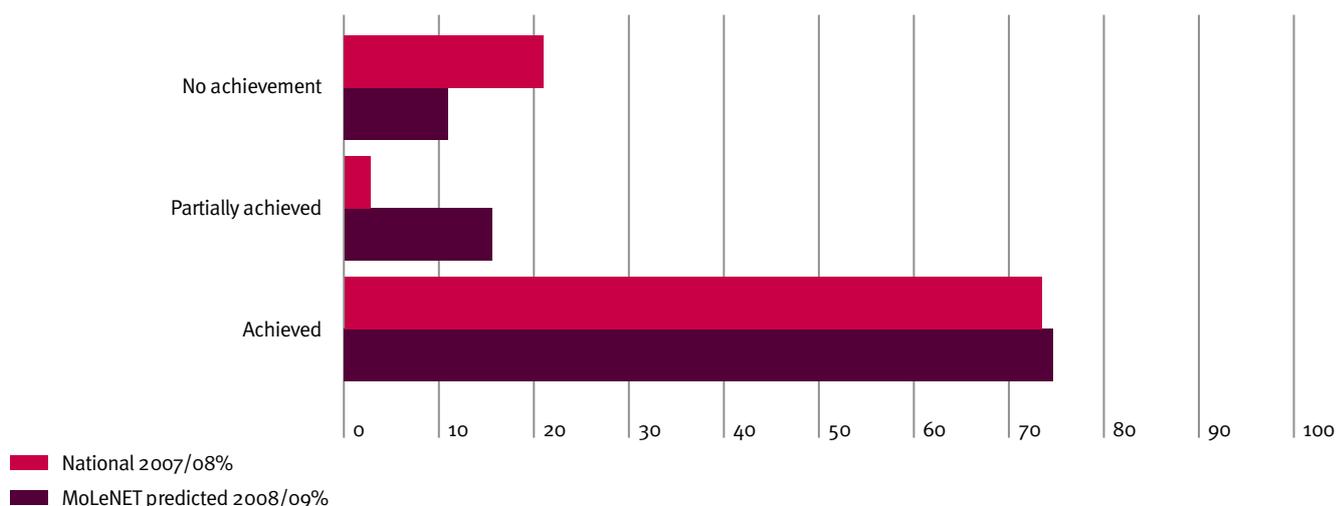
In considering this information it is important to bear in mind that:

- the MoLeNET figures are based on predicted, not actual ILR figures
- it has not been possible to control for the many factors other than the introduction of mobile learning that could have affected retention
- some practitioner researchers and project managers reported that retention and achievement improvement strategies were running in parallel with MoLeNET
- initiatives that involve re-thinking delivery, particularly those that involve special attention to the personalised learning needs of specific groups of learners, are likely to lead to improvements in retention and achievement whether or not they involve new technologies.

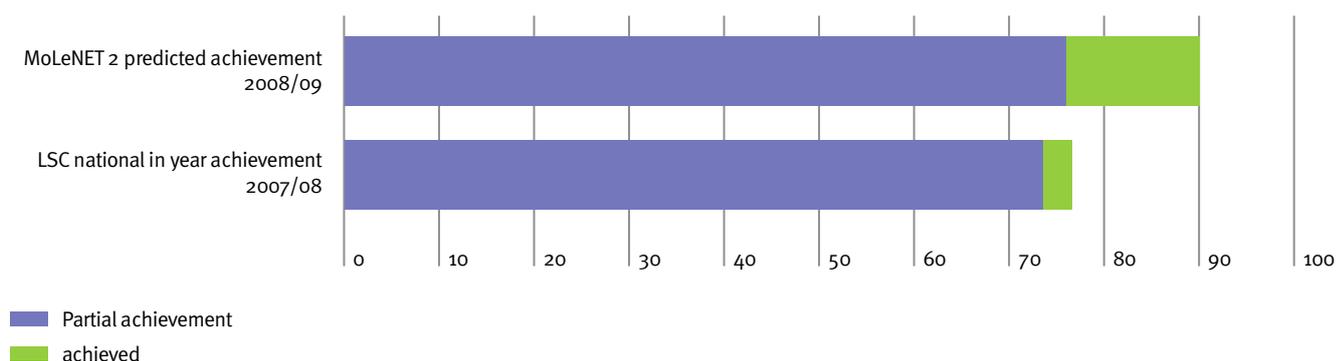
However, the findings of research carried out at project and institution level by practitioner researchers include support for the national level quantitative findings.

7.2 Achievement

Although the benchmark of LSC national in-year ‘achieved’ in the previous year (2007/08) is about the same as for MoLeNET 2008/09, the national ‘partially achieved’ figure is much lower and national ‘no achievement’ percentage is more than double MoLeNET 2 no achievement (see figure 14).

Figure 14 MoLeNET 2 learner achievement compared with national previous year

The overall achievement rate including partial achievements for the MoLeNET 2 sample was 13.4% higher than the national in-year figures for all FE sector colleges in 2007/08 (see figure 15).

Figure 15 MoLeNET 2 achievement plus partial achievement compared with national previous year

In considering this information it is important to bear in mind that:

- the MoLeNET figures are based on predicted not actual ILR figures
- it has not been possible to control for the many factors other than the introduction of mobile learning that could have affected achievement.

However, local research carried out by individual MoLeNET projects focusing on specific groups of learners has found significant, and in some cases substantial, improvements in learner achievement (see Section 7.4).

7.3 Progression

It is widely recognised that it is difficult for colleges to obtain progression data from all of their learners and in the case of MoLeNET 2 the destination of nearly one-third of learners is unknown. Where destination was known the greatest proportion were 'Continuing on their existing programme of learning' (38.7%) with another 22.2% continuing to further education and 2.6% continuing to higher education, while 5% progressed to paid employment or work-based learning including Apprenticeships.

7.4 Practitioner-led researcher findings of improved achievement

Local research carried out by individual MoLeNET projects with specific groups of learners found significant, and in some cases substantial, improvements in learner achievement (see below).

It should be noted that this does not cover all practitioner research findings regarding achievement. There were examples where there had been no improvement and there were a few reports of mobile learners whose achievement was slightly worse than that of previous cohorts who had not used handheld technologies.

Ashton Sixth Form College

Ashton Sixth Form College reported several cases of improvements in learner achievement recorded for students using handheld technologies for learning. The following data is based on predicted grades.

Level 3 music technology

The introduction of iPhones initially had a large impact on the group. Students were visibly motivated and keen to use them in the classroom to compose and create music. However, at the time it was difficult to download apps for composing or programming music because of financial issues, so instead students used the iPhones as a tool for referencing their own mixes of coursework.

As controlled conditions didn't allow students to work on their compositions and multi-track recording at home, the iPhone enabled selected students to transfer their audio mixes of material and reference, evaluate and assess their work with a view to improving and developing it.

When assessing and moderating coursework there seemed to be an improvement in the standard of coursework handed in by students with the iPhones, compared with students in the control group (see figure 16).

It was felt that this was mostly because students were able to make 'oral notes' on their recordings while referencing at home and then improve on them in college time using the studio. Students who were not able to do this found it slightly more difficult to achieve the sound they were looking for and required further support to mix down compositions and recording.

Figure 16 Music technology results for moderated compositions

	MoLeNET group	Control group
A grade	1	0
B grade	2	1
C grade	2	1
D grade	0	1

(group of 10 learners including 5 using mobiles and 5 in control group)

Level 3 dance

The dance students used iPods and Flip cameras. The iPods made music accessible for rehearsals in a busy classroom environment while the Flip cameras provided students with visual access to practical work for instant reflection and analysis. Overall, the devices were effective memory aids and encouraged reflective practice, which students often find challenging.

Students with iPods were able to complete rehearsal activities on individual projects in the classroom without distraction or noise pollution. They used them to practise solos and trios for AS Dance in their own time, which gave them greater independence in their work and ownership of the material. They also used them to practise the 30-minute dance, and this again helped them to increase their rehearsal time.

The predicted results for the students with the devices show a good achievement rate, with them all reaching their minimum target grade. The student feedback showed that the handheld technologies were of practical use with learning.

The teacher of the dance courses felt that the iPods supported rehearsals for practical exams. They gave the students freedom to work individually and without distraction; helped them to access the required music to practise performance pieces and meant that several students could work in one room using different music. It was felt that the devices had facilitated students' work on timing, phrasing and musicality. The cameras were highly effective as a memory aid and provided instant viewing of practical work. This enabled students to review and reflect on their work, which encouraged them to make changes, corrections and improvements.

Level 3 public services

Students used Xda Mantles with Wild Knowledge applications WildForm and WildMap to record evidence of some practical work for a unit on the Public Services National Diploma course. There were two groups of level 3 year 1 students: one was a control group and the other, which contained the most challenging students, tried out the devices and software. The form application was used to create a data capture form for each of the orienteering points visited. The map application was used to create the map and reference the orienteering points to be visited. At each point on the map the form was attached for recording their visit to that point.

All the students in the test group will pass the assessed unit in which they used the devices, compared to 94% in the control group.

Level 1 numeracy and literacy

A group of 20 level 1 learners demonstrated marked improvements in their engagement in class activities and improved literacy and numeracy results in external tests with a 100% pass rate and 100% high grades. Previous retention and success rates were 94%, so this represents a 6% increase.

These students used the Nintendo DS Lite with Spellbound and Professor Kageyama's Maths Training games and personal digital assistants (PDAs)/palmtop computers to capture video and photo evidence for their assignments and improve their communication skills. They also used the PDAs in their work experience placements to get extra evidence for their portfolios.

Staff comments included:

The level 1 learners have now been issued with PDAs to help with their studies. One group especially have made really good use of them. This group have language/communication barriers and the PDAs are an additional support that is in place to help gain evidence for their portfolios. The last task they had to do was to record five conversations and then evaluate the barriers to communication in each conversation. The next task is to get photographic evidence of examples of non-verbal communication.

We have been using the Nintendo DS devices in class to support literacy and numeracy. The January exam results were out last week and they have been fantastic for these students. Some students are now moving on to Level 2 work, which is an amazing achievement.

[We] ...used the Nintendos with a level 1 group yesterday. We tried out the maths games. I have never known them to be so quiet! They all had their heads down in concentration and some were determined to get gold for each task.

Capel Manor College

Capel Manor College focused on students at levels 2 and 3 studying in the school of arboriculture and countryside, using a range of specialist mobile-surveying equipment as well as PDAs.

Staff comments included:

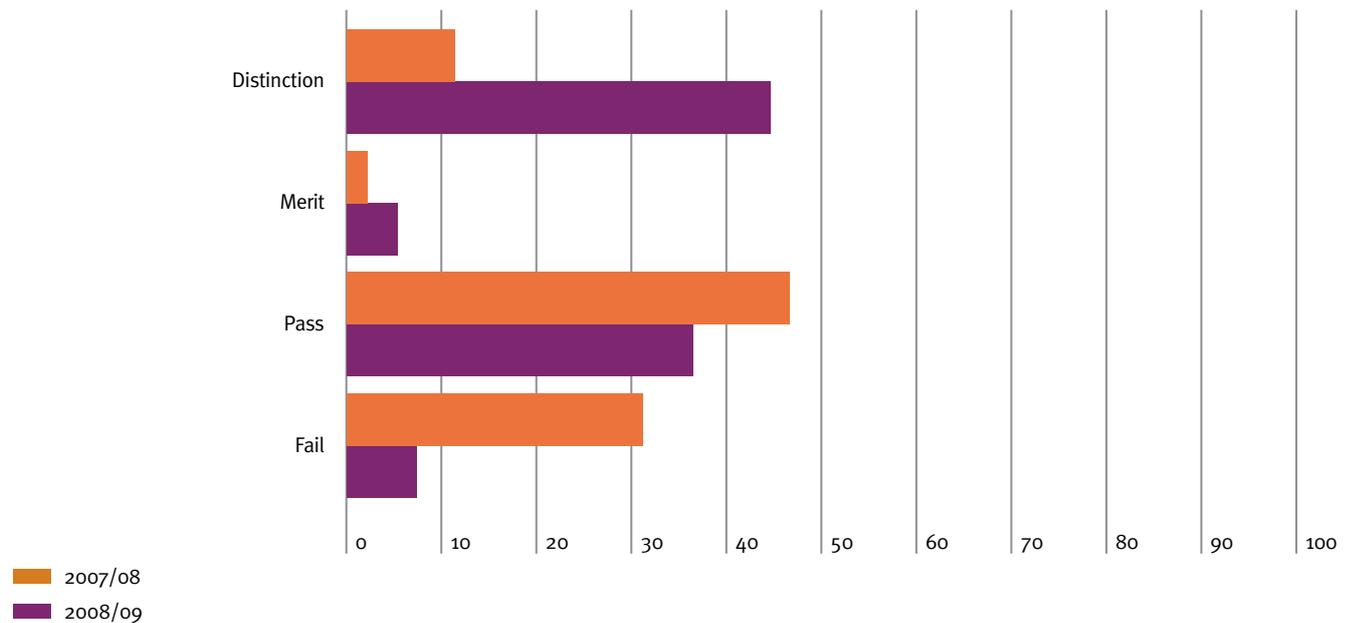
The general trend for the achievement data is one of improvement. In almost all subjects taking part in the project we have not only seen major increases in the pass/fail ratio, but also an increase in those students that are achieving higher end grades (merits and distinctions). More pass-level students are moving up to achieve at merit level, and more merit-level students are set to achieve at distinction level. (This data is based on predicted grades.)

The following graphs show a spread of the grades achieved in some of the subject areas involved in the MoLeNET project, where improvements in achievement have been found. The data is shown in percentage form to allow for the difference in numbers of students taking the subjects in each year (2007/08, 2008/09).

Tree surveys and reports (National Certificate Arboriculture)

'Tree surveys and reports' is a unit that looks at the techniques involved in measuring trees and assessing their condition and value. MoLeNET technology gave the students the opportunity to map trees accurately using GPS, measure them using laser measuring devices, and even look inside them using tomography; as well as giving the opportunity to collect field data on PDAs. In 2007/08 a high number of students failed the unit. This year's predicted grades suggest far fewer failing students and a high number of top grades. Staff said:

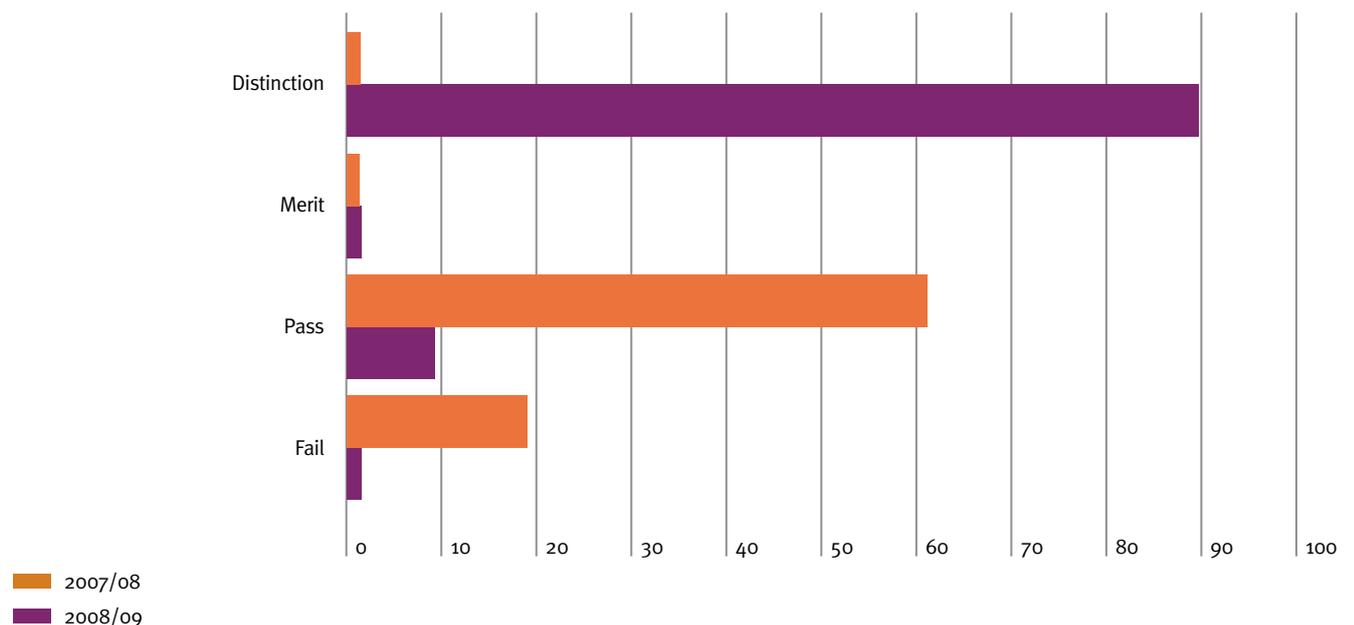
The inclusion of cutting-edge survey equipment seems to have inspired these students (figure 17).

Figure 17 Results of tree surveys (full time) expressed as a percentage

Freshwater and wetland management (National Diploma of Countryside Management)

The 'Freshwater and wetland management' unit involves a great deal of collection of field data, particularly water contaminants, measuring flow rate, etc. In previous years this had been carried out using 'old-fashioned' manual tests such as pH strips but the MoLeNET students had access to mobile devices to electronically survey the environmental conditions. Staff said:

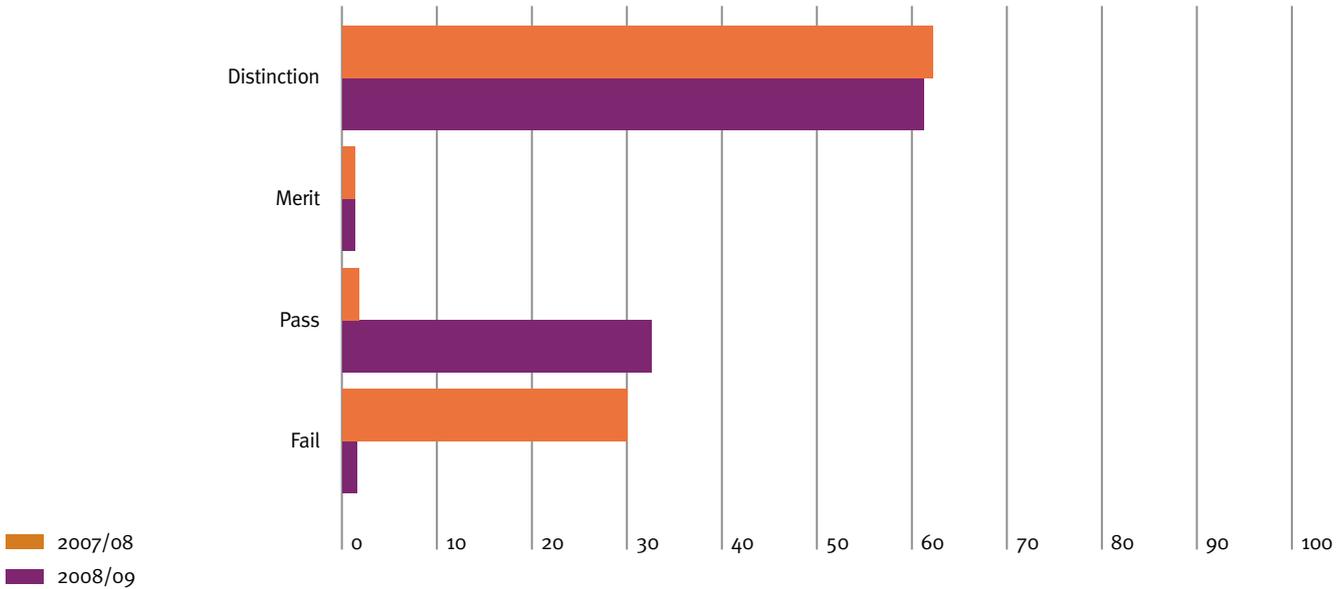
Achievement in 2007/08 saw only low-level grades. In 2008/09 we are expecting to turn these low-level passes into high-level distinctions (figure 18). Again the students are now using equipment that is industry standard, and are carrying out professional-level surveying with the mobile technology.

Figure 18 Results for freshwater/wetland habitats expressed as a percentage

Coastal habitat management (National Certificate Countryside Management)

‘Coastal habitat management’ is similar to the ‘Freshwater management’ unit in that it incorporates many environmental tests. Now the students can use industry-standard equipment rather than manual tests. Staff said: ‘Academically we are expecting to convert last year’s failures into passes, whilst maintaining a high number of distinction levels’ (figure 19).

Figure 19 Results for coastal habitats expressed as a percentage



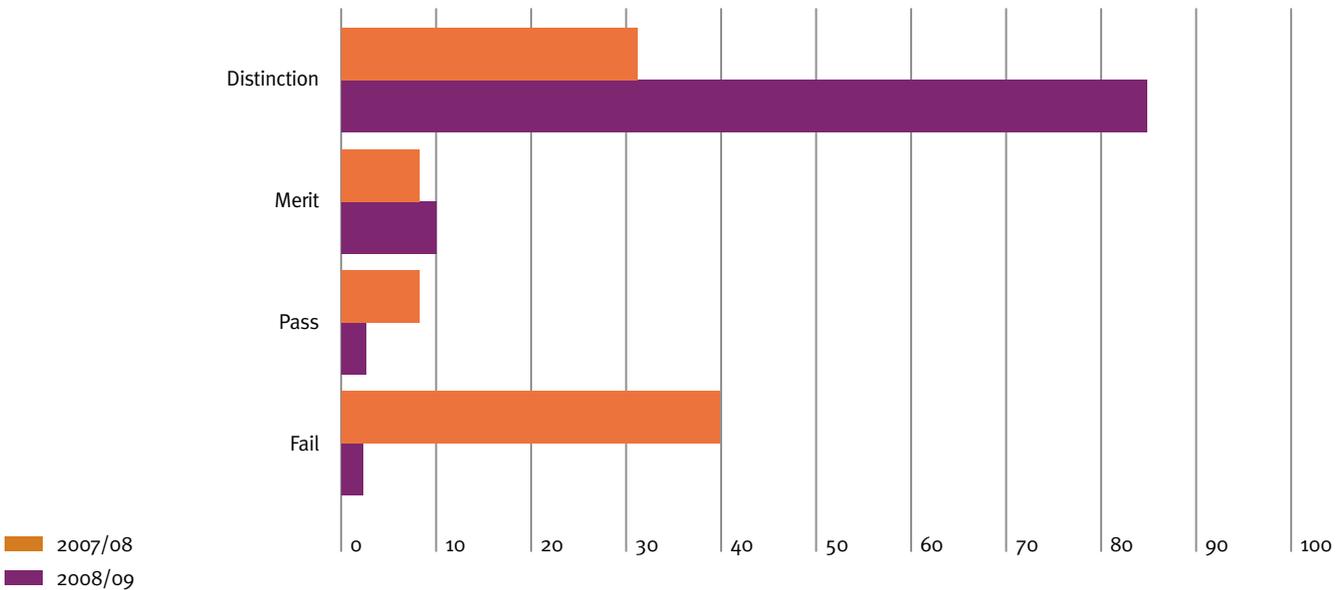
Plant and soil science (National Certificate Countryside Management)

‘Plant and soil science’ incorporates some elements of practical environmental surveying. In previous years this had been carried out using manual testing apparatus, pH strips, etc but mobile technology meant they could take digital readings, which meant data could be easily manipulated in the field. Staff said:

Last year’s academic performance in this unit was an approximately 50/50 split between pass and fail. In 2008/09 we are expecting to change all of those fails not only into passes, but into high level passes at distinction level.

Predicted results are shown in figure 20.

Figure 20 Results for plant and soil science (countryside) expressed as a percentage



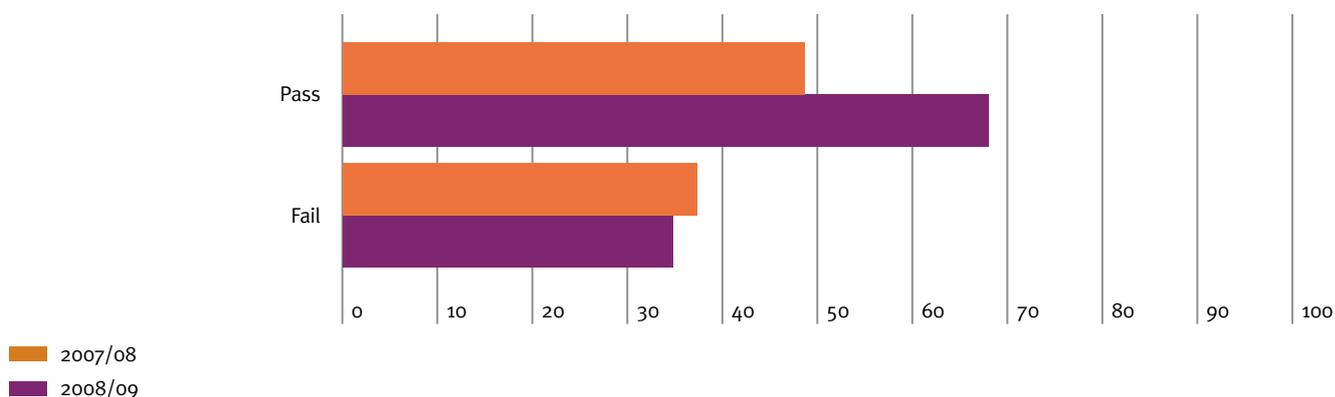
Tree surveying (City and Guilds 0220 – Part time)

The City and Guilds class comprises part-time students who combine education (at industry entry level) with industry work. The key equipment for this unit was the tree-measuring technology outlined in the full-time National certificate above.

Using industry-standard, cutting-edge mobile technology suggests that the percentage of students passing this unit will increase (see figure 21). Staff said:

The inclusion of the mobile technology has increased enjoyment of the subject, and exposed the students to some of the industry equipment that they would otherwise have only heard about.

Figure 21 Results for tree surveys (part time) expressed as a percentage

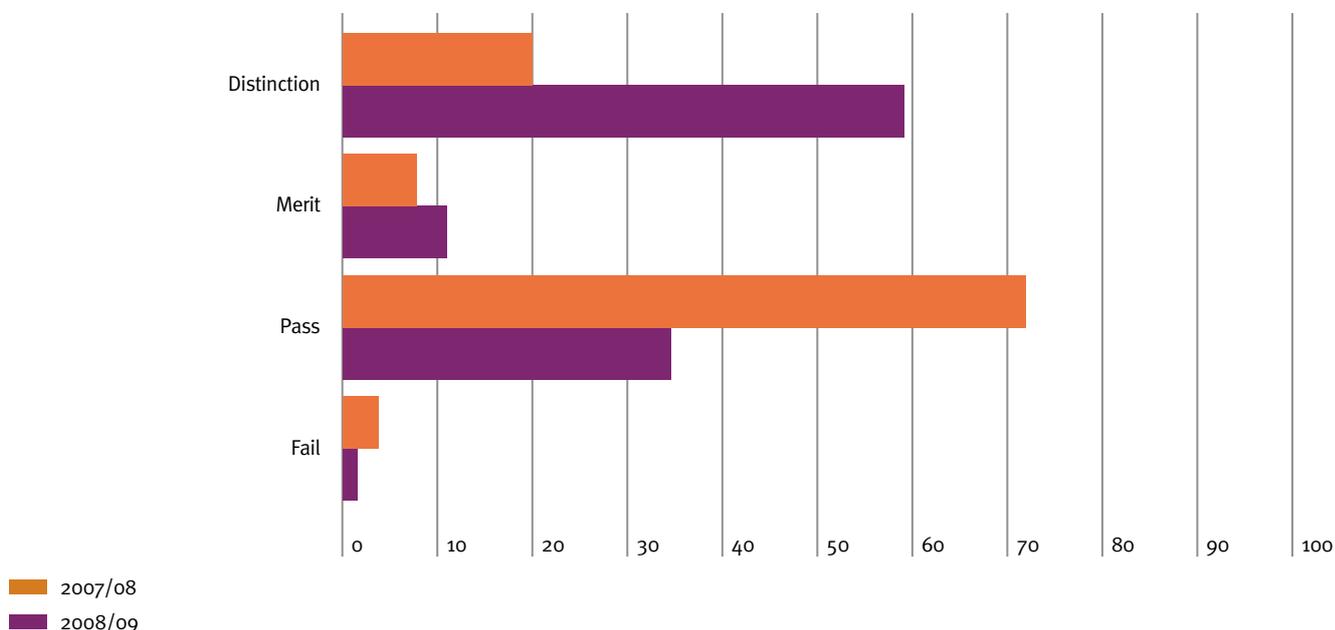


Plant and soil science (National Certificate Arboriculture)

‘Plant and soil science’ incorporates some elements of practical environmental surveying. In previous years this was carried out using manual testing apparatus, pH strips, etc, but using the mobile technology to take digital readings allows data to be manipulated in the field. Staff said:

Last year’s academic performance in this unit was mainly at pass level. Again this year we are hoping to see (i.e. predicting) extra distinction-level achievement (see figure 22) as students get enthused by the new equipment now available to them.

Figure 22 Results for plant/soil science expressed as a percentage

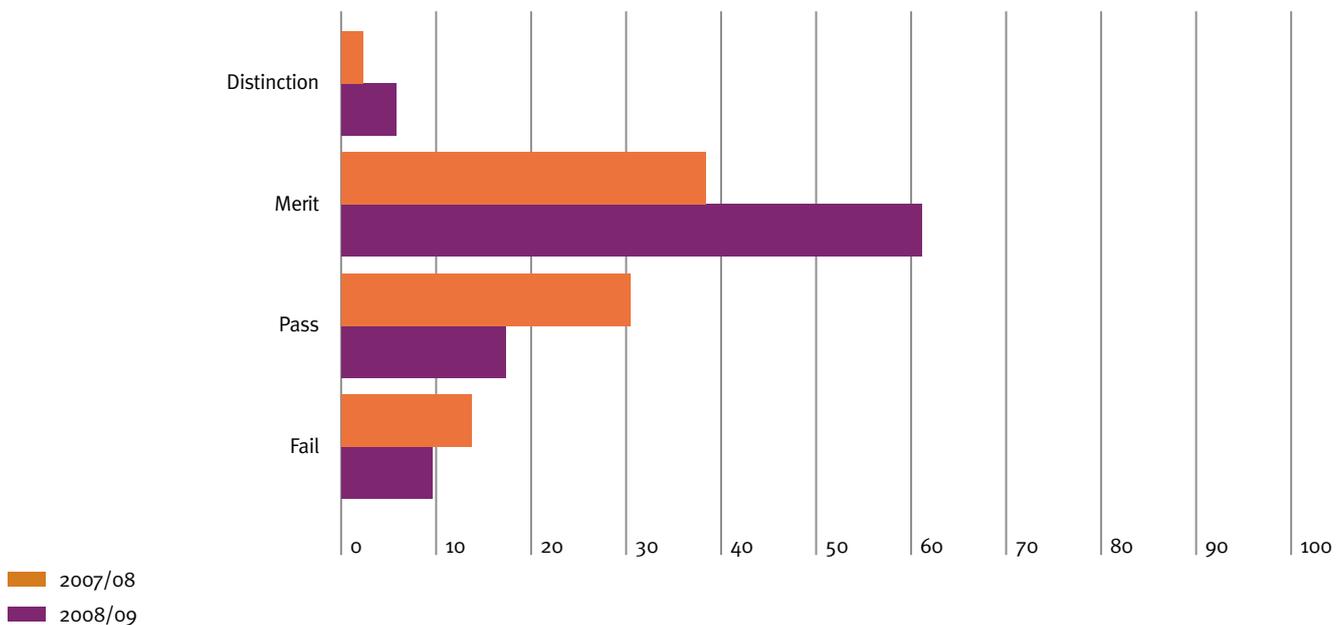


Conserving British habitats (First Diploma Countryside and Environment)

‘Conserving British habitats’ is quite a broad unit; one part involves the students undertaking habitat surveys of the local area. Previously this would have been a pen-and-paper exercise in the field, but the new mobile technology has opened up the opportunity to record data including photographic evidence all on one device. Staff said:

It is predicted that academic achievement will increase with more students achieving merit grade this year than in 2007/08 (see figure 23). Again the surveying has become more interactive and alive using the mobile technology than in previous years.

Figure 23 Results of British habitats expressed as a percentage



Gloucestershire College

The key activity areas involved students in the 16–19 age range, working at levels 1 and 2 and supplemented the traditional written workpack approach with the use of evidence generated using a broad range of media. These included trials with ActivExpression, Nintendo DSi, PSP with camera attachment, eeePC mini laptops and Sanyo Xacti. The engineering, plumbing and electrical school was at the centre of the research and the devices were shared and used by a broad range of students, besides the 25 envisaged at the research design stage. The devices were used in both classroom and workshop environments ‘not only to aid evidence capture but also as an engaging learning tool’.

One particular aim of the research was to find out if the use of handheld technologies for teaching and learning and for assessment would affect wider Key Skills success rates. At the stage of the academic year when MoLeNET 2 projects reported the figures were awaiting confirmation but indicated an identifiable 5% + improvement on the previous year. College management believed this improvement to be at least in part due to the use of the mobile technologies.

Of the four schools in the research area (Building Services, Construction Crafts, Construction Technical, and Engineering and Motor Vehicle) it can be demonstrated that at 68% pass rate it is above the overall college pass rate of 56%. Statistically speaking, that is a dramatic improvement in a high-growth area of the college with many new and less experienced staff. The researcher again notes that there may be many other factors involved but the impact of the devices used can be estimated from the dynamic and innovative solutions to especially routine and on-the-surface dull activities. A classic example of this would be changing a wheel on a car where a full range of skills can be reflected on and shared from a video capture. Although the focus is on assessment, the flexibility and innovation engendered by the approach have contributed to the overall improvements that have gone beyond not only the original Wider Key Skills research remit but also the general teaching and learning experience.

Leeds College of Art and Design

Leeds College of Art and Design investigated the impact of mobile technologies on the success of first year National Diploma Art and Design and Graphics learners. They found that the success rates of learners undertaking ND1 Art and Design and Graphics improved by 4% on the previous year. Many learners suggested that the introduction of mobile technologies had given them more opportunities for learning and made aspects of their course more interesting and enjoyable. Success rates for AS design programmes also improved by an impressive 63%. This was partly because of improvements made to the course now in its second year but also because mobile technologies helped learners to practise research skills inside and outside college. Finally, an increase in merit and distinction grades of 16% was recorded in the contextual influences in art and design unit of the course. It is suggested that the 51% replacement of pass grades with higher grades shows the impact of mobile learning on learners less responsive to more traditional teaching and learning techniques.

Redbridge College

Redbridge College collected and analysed management information systems (MIS) data to assess the impact of mobile learning on the achievement of vocational learners. The data indicates that 91.2% of the 68 MoLeNET learners either fully or partially achieved, compared to 86.6% of learners on the same courses but not involved in MoLeNET (see figure 24).

Figure 24 Redbridge learner achievement rate by learner groups

Learner group	MoLeNETgroup	Other groups
NVQ2 Hairdressing	79%	72%
National Diploma in Media	91%	87%
First Diploma in Media	100%	100%
National Diploma in Music	93%	86%
VTCT Skills for Working Life (Hair & Beauty ESOL)	93%	88%
Average:	91.2%	86.6%

Overall, the learners using mobile technology compared to the learners without access to mobile learning improved on their achievement by 4.6%, which is very close to the 5% set target.

When comparing the MoLeNET learners with the previous year, a 5% overall increase in achievement was measured.

Reigate Sixth Form College

Reigate Sixth Form College's project focused on podcasting and vodcasting:

All three of the departments that participated in the MoLeNET project had previously been failing to hit national benchmarks for high grades (A/B) (AS Government and Politics 7% below, A2 Government and Politics 5% below, AS Business Studies 12% below and A2 History 10% below).

Overall achievement in AS Business Studies was 4% below national benchmarks and AS History was 2% below. AS Business Studies was also 2% below national benchmarks for value added. The project focused on raising all these indicators up to and beyond national benchmarks, with a particular emphasis on improving higher grades, in line with the college's own strategy.

In total, 374 learners were involved in the MoLeNET project, approximately 22% of the college population, with 16 members of staff (including technicians) supporting the introduction of the technology and leading classroom practice. During the project, health and social care (level 2 provision) was also involved because their staff showed specific interest in incorporating mobile learning devices in their teaching and learning. This was particularly valuable because it meant they got some student-based vodcasts and introduced them to the vocational courses. It also spread the project across two academic levels.

The History and Business Studies AS learners used Archos 605 devices at home and in the classroom. They often downloaded the podcasts and vodcasts from the server in college across the wi-fi network and listened to them on the way home from college and at home when they were completing their homework/revision. The Government and Politics learners used the Lenovo netbooks purely in class and accessed the podcasts and vodcasts remotely from home and their own devices. The BTEC First Health and Social Care learners experimented with the Sony PSPs in their coursework both in the classroom and in the work place, recording their assessment interviews and then evaluating their effectiveness. The allocation of devices reflected the nature of the subject and the intended specialism of each practitioner'.

The A2 History learners had access to all the resources created for the project (podcasts and vodcasts) but not the mobile technology. This helped give some idea whether any improvement in high grades was a result of the podcasts/vodcasts or personalised learning through the handheld devices. The AS Business Studies learners also provided a good control. Two out of the four classes on the course were issued with Archos 605s and the other two were not.

They also examined the impact of the mobile technologies on achievement in learning by comparing predicted and actual grades for learners using mobile devices, and by comparing the achievement levels and grades of learners using mobile technologies with those from a previous cohort or a control group not using mobile technologies.

AS Business Studies

Learners in AS Business Studies who had been issued with mobile learning devices on average achieved one grade higher than their target/predicted grades. In the control classes (who were not issued mobile devices), learners on average achieved their target grades and many performed worse than their predicted grades. The Business Studies mobile learning resources focused particularly on gaining high grades.

There was 98% achievement in the cohort compared with the national benchmark of 87%, an improvement of 15% on the previous cohort. High grades also improved from 19% to 52% (21% above the national benchmark).

High grades were also substantially different between the two groups. In total, 68% of the mobile technology learners achieved A or B grades in their AS Level, compared to just 33% of learners in the control group.

Overall, Business Studies clearly demonstrated a marked improvement on the previous year's cohort and also a dramatic difference in the performance of the learners using mobile technology and those who did not.

AS and A2 Government and Politics

Across the Government and Politics courses (AS and A2), learners generally achieved their predicted grades. These learners were not issued with personal mobile devices. Instead they used their own devices and netbooks in college and out of college, they relied on their everyday access to the internet, Moodle and other e-learning resources.

Overall, in Government and Politics, the learners' achievement seemed to improve throughout the project, but not to the levels in the Business Studies department, perhaps because they were not issued with personal devices and simply had access to additional on-site facilities:

... it was extremely useful having the netbooks in the classrooms. Previously, we only had four computers, which wasn't really that much use. Enabling students to have a netbook each meant that they were able to conduct more independent research and analysis, which seemed to become evident in their homework and practice essays.

AS History

In AS History, learners were issued with their own personal Archos 605 devices. Like the AS Business groups, they showed an improvement on their predicted grades. The AS History podcasts and vodcasts focused on generic exam technique and knowledge skills, rather than specifically on achieving high grades (which was the focus of the Business resources).

Perhaps as a result, the high grades did not hit the national benchmark but nonetheless the residual performance of the learners did improve, with group performances ranging from an Alps⁷ index of 0.98–1.10 compared with the median index of the subject of 0.96. Although it is not possible to allocate this value added improvement purely to the effects of the mobile learning resources and devices the positive responses to them within the learning environment is likely to have had a positive impact on the learning outcomes of the students.

A2 History learners, who had access to resources, but no mobile devices, showed a slight improvement in their grades from their predictions.

Staff responses

Overall, the Business staff found the use of podcasting for revision extremely productive and were convinced that it had had a positive effect on results. They are now planning to embed this across all courses in the coming year. Podcasts will be included as end-of-topic revision throughout the year, as well as summative focus during exam leave.

⁷ The Advanced Level Performance System (Alps) is a nationally used A-level, AS level and BTEC National analysis and training package for delivering quality improvement in schools and colleges. For further information please see www.alps-va.co.uk/About-Alps

In Government and Politics the staff were also keen to further explore the use of podcasting and vodcasting. During the project, this department focused on summative vodcasts for the exam leave period and topic-by-topic enhanced podcasts that would summarise key points. One member of staff commented:

I think the methods we selected are right for our students. It appears to have engaged them and it now just needs to become part of their routine. I think if we had been able to start the production earlier (when we had more time), we would have been able to produce more, so that there would have been one per topic.

The head of government and politics plans to produce detailed revision sessions through vodcasts for the forthcoming academic year and the other members of staff on the course are producing topic-by-topic summaries and recaps.

In history, the main focus was on producing knowledge recaps and general exam technique podcasts and vodcasts: ‘the mix between the two types has proven popular with the learners, a variety of different inputs seems to be essential if they are going to remain engaged in revision’.

Truro Consortium

Truro consortium described the benefits that mobile learning with smartphones had brought for the students involved in MoLeNET and its impact on achievement and success for learners at Launceston College. Half-term progress statements revealed that 87% of the students who used their mobile device achieved higher grades than those who did not have a device, especially in childcare and design technology.

Walsall consortium

Walsall consortium’s MoLeNET project involved learners from various backgrounds including disaffected and disengaged youths and learners who had had very negative experiences of education. The success rates of learners on the School Engagement Programmes (SEPs) in 2007/08 was 76% – 4% lower than the college target – and so MoLeNET was seen as an ideal initiative for these learners:

As a key part of its role within the college, the programme seeks to establish positive links with other local organisations such as schools and training providers which have an interest in young people, their education and their welfare. It was deemed that m-learning would and could engage learners; this was seen as a key driver in gaining success rates for this cohort.

They decided to present learners with an in-house certificate for achieving 95% attendance and punctuality, meeting behavioural targets, and proving their commitment, arguing that without those factors, the qualifications would not be gained. These factors were also expected to affect their school-based education, showing that the ‘Adult Literacy and Numeracy M-Learning’ programme was enhancing their full-time course progress as well as retaining them on the programme as an end in itself. Finally, they set out aims set for the end of the project when learners would be considered for awards – Student of the Year, Star Award and Class of the Year. These were considered great achievements and learners’ self-esteem was raised just by being nominated. The result of this was that one learner gained Student of the Year and one learner successfully attained the Star Award.

The five-month programme began with an initial induction week consisting of a one-hour talk introducing the aims and outcomes of the course. In the first week there were then two sessions in which learners were split into teaching groups.

All the learners who stayed on the course achieved their aims and the success rate jumped from 76% to 90%. For many learners, the qualifications from the short courses are their first formal qualification and the rise in self-esteem for those learners is immeasurable. Staff commented: 'There is no doubt that m-learning has played a considerable part in this success.'



8 Employment and employability

Many of the MoLeNET 2 projects targeted work-based and employment-orientated learners, including Apprentices, Train to Gain and Diploma learners.

MoLeNET 2 practitioner researchers found that mobile technologies were excellent tools for collecting evidence, compiling portfolios including pictures and video (**The Sheffield College**), making appointments and communicating with others, and therefore great for supporting learners in the workplace (**Aylesbury College**).

They were also useful for supporting Apprenticeship full framework achievement especially in the health and social care sector (**Exeter College**). Students in this sector work varied shifts and traditionally struggle to achieve all the components of their programme because of the impact of their work commitments on their attendance. However, all the students who embarked on the programmes in September 2008 achieved the full framework in that academic year. Use of UMPCs allowed them 'to work when they had the time and curiosity' and to produce work 'in a more timely fashion' and 'stay on track'.

Train to Gain

Train to Gain learners at several colleges were very positive about mobile technologies and the benefits realised are discussed below.

Access to technologies and resources

Train to Gain learners benefited from being able to access resources that might otherwise have been unavailable because of a lack of computers or internet access in the workplace. **Trafford College** found the provision of UMPCs enabled their Train to Gain learners to access the Move On and Skillswise websites, use the online resources and practise tests. They were able to take ownership of their learning, doing online activities at times that suited them. Tutors at the college also benefited from being able to check which Move On topics students had accessed and look at tests they had completed.

The **Joseph Priestley** consortium reported:

m-learning can provide access to technology when none is otherwise available; firms have ITC facilities, but these are either always busy or not available owing to data protection issues... This year, the connectivity provided by having devices with data contracts has allowed learners in the workplace to undertake internet research, something which was not previously possible.

Collecting evidence for portfolios

Mobile devices enabled learners to collect evidence of their work and progress in a variety of ways, not just with paper. **Exeter consortium** reported that once the Train to Gain learners had become confident with the Flip cameras, they used them to gather timely evidence for their portfolios. Other projects used cameras in mobile phones or attached to the Sony PSPs handheld games devices for evidence and data collection.

Assessment

The Sheffield College trialled the use of digital pens and digital paper with the aim of reducing the time required to process completed paperwork from work-based visits, thus making the procedure more efficient.

At the **Joseph Priestley consortium** learners benefited from using HTC Advantage smartphones with data contracts so that assessor forms could be completed electronically and signatures could be captured using the inking facility in Microsoft Word. External verifiers who were shown the new procedure were keen for these methods to be used more widely across the college as well as in a workplace setting.

Exeter consortium fed back that: 'Employers have reported that they understand the programmes their employees are on better and that they now know how they can support their achievement and feel more involved.'

Diplomas

Five projects reported using mobile learning with Diplomas and noting a very positive impact as described below.

Increased access to technology

Learners from disadvantaged backgrounds or sharing home computers with other family members benefited from being able to access technology away from the college when and where they needed it.

At **Joseph Priestley consortium** learners studying the new Level 3 Diploma in Construction and the Built Environment were given netbooks to enable them to study and complete assignments when they were not in college. Some 'learners representing the college in Russia took their mobile devices with them and collected numerous images to help with design of buildings'.

Leeds College of Art and Design noted that provision of mobile learning technologies for some learners had the additional benefit of reducing pressure on other IT facilities in the college.

Increased creation of, and access to, teaching materials and resources

The Manchester College reported that the aim of their Diploma project was for tutors to produce podcasts, vodcasts, screen capture tutorials and videos of lectures covering programming, web development, networking and database design. The resulting learning materials were designed to be viewed by learners on PSPs, as required, during taught sessions and for revision. The PSPs were also taken to a fast-food restaurant that provided WiFi internet access; this proved to be a viable and cost-effective way for learners to access learning materials away from college. Many technical challenges were overcome to 'make the use of mobile technology an integral part of programme delivery rather than an additional or supplementary element'. A tutor stated 'there is now no going back'. The response from learners was reported as 'extremely positive': 'Attendance, retention and ultimate achievement have all been improved to the point that lesson plans have been re-written to include the new delivery tools available.'

Gloucestershire College's Construction Diploma students used MP4 video cameras to film experts on architecture and construction, and then used the videos for reflection activity and presentations.

Joseph Priestley consortium pre-loaded learners' mobile devices with learning materials and resources that they could use at times and places convenient to them. They reported:

Each netbook had learning resources installed ... including ... resources for Construction, Key Skills practice tests to support their Skills for Life revision, direct link to the National Learning Network resources held on the college's VLE and SITECAM; a programme of work showing the different stages of the completion of a constructed building including videos, animations, time lapse, management and design and alternative techniques to support their out-of-college learning. These learners are continuing to use their netbooks over the summer to carry out research and work on their Diploma project.

Increased engagement and collaboration

Leeds College of Art and Design felt that their learners were more engaged in research and written work when using the mobile devices than when using other methods. They also observed an increase in collaborative work across the Diploma qualifications involved 'primarily through the use of online forums to discuss curriculum-based topics, collate/share research and online galleries used to share project outcomes'.

Strengthening the link between theory and practice, portfolio building and improving outcomes

Leeds College of Art and Design found:

... an increased level of student research, students' awareness of post-20th century artists/designers and increased student performance on both academic and research-based course units. Success rates, achievement and high-grade achievement have risen dramatically in some areas and have far exceeded projections outlined in the initial bid.

Diploma learners at **The Sheffield College** collected photographic evidence of their work using mobiles. The photographs were then uploaded and stored on the network in the student's own space.

Truro consortium Diploma learners used mobile technologies to collect video and photographic evidence to support portfolio building. They reported:

A number of the students used the Windows Mobile and Office Mobile features to share work, communicate with each other and to upload work to their own computer systems using ActiveSync. Across all the courses and levels there has been 100% retention and all the students are returning to complete the second year in September. At the end-of-year feedback session they made a unanimous plea to be allowed to retain the phones into the second year and they have agreed to undertake a commission to produce training resources for staff and students. This will form part of their unit assessment in the second year.

9 Case studies: work-based and vocational learning

9.1 Using Sony PSPs to support Laundry NVQ

Learning context: Work-based learning – Laundry

Technologies used: Sony PSP

Keywords: training, assessment, access to learners, learning material

Introduction

Bridgwater College has been working with laundries for over two years to deliver NVQ level 2 training and assessment. Their aim was to develop the use of the Sony PSP for learners who missed training sessions through illness or holidays. They wanted to use it for gathering video assessment evidence and as a training tool. They hoped that using a combination of PowerPoint/video/questionnaires/audio on the PSP for the training ‘package’ would be an improvement on the current format of workbook and PowerPoint presentation alone, which could be rather repetitive and uninspiring.

There were typically groups of 6–12 learners in the laundries. It is not a particularly well-paid sector and much of the work is repetitive. Despite being vocationally able, many of the candidates had below-average levels of qualification, having worked some years with the laundry. Introducing a learning environment had to be done carefully and supportively. The teaching staff originally greeted the project with some doubt and scepticism. There were concerns that candidates might feel threatened by having to use more technical devices, that the devices might be stolen and, in the absence of a trainer/assessor, that they might not make full use of them. There was concern about the quality of video captured and the use of video in an environment where commercially sensitive information could be divulged accidentally.

Addressing the challenge

Sony PSPs were handed to learners, who were briefed to film or record themselves undertaking tasks similar to those that they had performed for their NVQ assessments. They were also asked to try to film footage that might be used to help candidates in other laundries with their NVQ. The PSPs were given to learners at Regency Laundry in Bath and Sunlight Laundry in Newton Abbott. The brief was not over-prescriptive; it allowed the candidates relative freedom, with a review of progress expected two weeks after the devices were distributed.





Outcomes and benefits

A film of laundry drying, packing and sorting operations was shot, including a recording of a description of the process, technical points and the safety issues of tumble drying. The candidates became comfortable with and willing to continue to use the PSP after the initial successes. The first efforts provided a powerful introduction to capturing valuable learning material– being able to watch other learners in other laundries.

There were also immediate and great unforeseen benefits to the learners in the development of confidence and self-belief.

Learners' reactions

They enjoyed using the PSPs. They were very keen to continue and if necessary conduct the project in their own time!

This will be useful for teaching people who don't speak much English.

Teachers' reactions

It's certainly opened my eyes. The picture quality is fantastic.

This could be really useful.

I was amazed at how motivated the learners were to use it!

Manager's reactions

The manager's reaction could best be described as rather bemused and annoyed. He seemed to be unhappy that staff were wasting time playing with 'toys' instead of working or at least studying.

Assessors' reactions

Assessors' reactions were cautiously optimistic. Use of this type of evidence for assessment needs to be carefully managed to maintain good quality and facilitate internal/external verification. It will definitely need to be presented in small, well-identified sectors if used and used alongside other forms of evidence of competence.

Key messages and lessons learned

- Going forward, employers' managers and supervisors should be briefed about the use of the PSP, showing examples of how they can aid learning.
- Ensure that the use of the PSP is well tracked to avoid the learner losing interest.
- Make sure the learner has sufficient time, support and resources to use the device successfully.
- Select a pilot group sensibly, targeting a potentially receptive initial individual or group to generate enthusiasm.

Next steps

The college will work with the learners to build a greater library of material. This will allow the development of new, more effective and fun-to-use interactive teaching media. A pilot unit will then be selected for delivery using the PSP.

9.2 Using the iPod Touch to support construction and hair and beauty

Learning context: FE classrooms, workshops, work-based learning, offsite learning

Technologies used: iPod Touch, MacBooks

Keywords: construction, hair and beauty, MP4, wiki, social networking

Introduction

The WILMA (Work-based Individualised Learning through MP4 Applications) project at **Hastings College** involved 162 learners and 20 members of staff, of whom 14 were teaching staff. The learners were drawn from three curriculum areas, construction, hair & beauty, and academy 6* (AS/A-level learners). They were a mixture of levels, 1, 2 and 3, and the majority were aged 16–19. The project was designed to investigate the use of MP4 (iPod Touch) mobile technology to aid learning, supported by a wiki to encourage social networking. Staff were trained to create media-rich content to enable learning to take place anywhere at a time to suit the learners.

Hastings College is on the south coast in an area of regeneration. Many learners are from deprived backgrounds and lack access to technology and computers; it is also an area where there is poor broadband connectivity. This was the background against which the research took place.

Intended outcomes

The main aim of the project was to demonstrate the use of personal MP3/4 players across a range of learning activities, measure the impact of m-learning on learner success and analyse the results. The project also demonstrated the ease with which staff can learn to develop media-rich learning content and how such content, once developed, can be used in a variety of teaching and learning environments.

Addressing the challenge

The first issue was training the staff and the learners to use the equipment. At first the staff found it difficult to create media-rich content, but a mandatory weekly staff-development programme enabled them to progress quickly and develop their 'm-confidence'. The learners received an induction for using the iPod Touch, and as many were already familiar with iPods for downloading music they quickly became confident users. The wiki was easy to access and the learners became very involved in the development of this in some areas. Some learners uploaded their own content for others to share and many learners helped to develop content.

Outcomes and benefits

The overall retention rate of learners involved in the programme was 96%. This was more than 10 percentage points higher than the long qualification retention rate of those not in the m-learning project. Qualitative feedback was overwhelmingly positive, with learners describing their excitement at receiving the iPods and how the use of them had significantly supported their learning. Teaching staff were pleased with the new tools and skills acquired as a result of the project, and were convinced that the mobile devices and supporting web environment had contributed to improving engagement, attendance and retention, long before the data confirmed this.

Learners' reactions

Learners were very positive; they said they 'felt privileged' and 'special' to have been given an iPod to support their learning. They felt that Apple was a 'cool' brand that would have been out of their reach so they treated them with respect. Other learner reactions included:

The iPod Touch was good – I loved it.

The Touch was very easy to use and helpful when it came to looking up work.

Watching podcasts was helpful revision for literacy and numeracy. Good to be able to answer questions on the blog.

Teachers' reactions

The staff were very enthusiastic and inspired. They embraced the technology and developed their m-confidence as a result. One staff member said:

It provides opportunities for easy-to-access information, more flexible learning methods, at a time to suit the learners. It makes the sessions more interesting and engages the learners.

Managers' reactions

The principal actively encouraged and supported the project from the very start, and was delighted to see the progress made. She highlighted the MoLeNET project as a success and congratulated the team on several occasions, including presentations to the entire college staff, and in the monthly newsletter accompanying salary advice.

Key messages and lessons learnt

Feedback from the project was very positive. It worked well both in and out of college where there was access to a network. Some learners did not have access at home, and so the teaching staff built the use of the Touch into their sessions.

Use in college sessions, in workplaces and in workshops worked very well; the learners engaged with the content produced, and the flexibility it provided.

It is helpful to have senior management and the governing body on board, a coherent and mandatory staff development programme and a support structure. The team must include practitioners, student representatives and a member of the IT department for technical support.

Next steps

The college will develop the project by expanding on the staff skills base and training staff to deliver the 'Digital Creator' award. Year 1 learners returning will have their Touch returned for the second year. A series of workshops are also planned to disseminate the benefits of mobile learning to staff in other areas.

9.3 Using netbooks and mobile phones for heating and ventilating level 2 NVQ

Learning context: FE classroom, in the workshop, work-based learning

Technologies used: netbook, mobile phone, audio-recording equipment, wireless access

Keywords: retention, assessment, work-based evidence, audio assessment

Introduction

The MoLeNET mBuild project had two partners: **Leeds College of Building**, a specialist provider of FE construction courses, and **Joseph Priestley College**, a general education provider. It aimed to provide level 2 NVQ heating and ventilating engineers (block-release learners) with mobile learning so that they could collect evidence for assessment in the workplace and learn their trade at a convenient time and place outside college. The mobile devices chosen were netbooks. They were required to hold learning resources that would allow the learners at work or home to carry out set tasks and collect evidence towards their portfolio.

Intended outcomes

The aim was for learners to carry out their own research and create their assessment tasks and work-based evidence collection electronically using mobile devices. The project also looked to capture tutors' experiences of the use of mobile devices for teaching and learning, including their impact on students' engagement and their own engagement.



Addressing the challenge

The challenge was creating the netbook image (to set up all the devices in a standard way and facilitate quick and easy recovery from any problems) and getting the mobile devices ready for use by the learners and tutors. They also needed to install software and resources for wireless access so that learners could write their assignments.

While the imaging of the devices was taking place, the learning resources were collated along with practice questions for future online real tests. The resources were structured in a webpage to allow quick access via Internet Explorer. Each netbook was pre-loaded with them so that learners could carry out tasks set by their tutor, practise their course revision tests at work or home, and so improve their knowledge and understanding before they took the actual tests online.

Outcomes and benefits

Staff gained valuable experience from capturing remote learning outside the classroom by recording learners' achievements directly to their netbook. Learners were able to retrieve their learning resources and produce their coursework anywhere, at any time. The learners were able to access research on the internet in their own home, without having to share the family computer. They could download work-based images taken at work from their mobile phone onto the netbook using Bluetooth for inclusion in their portfolio and use the pre-loaded resources to prepare their assessment documents for bringing back into college.

Learners' reactions

The learner cohort of this group comes from around the country (London, Birmingham, Sheffield and Newcastle) and they were surprised to receive the device with their learning content installed with wireless internet access ready.

The netbook has helped me to record my evidence from site and carry out my homework, I do not have to carry paper documents with me and re-type them in.

They were generally enthusiastic about the device:

I found it small, lightweight, easy to carry around, with fast access to software that I can take anywhere and do my work; even on the train.



Teachers' reactions

The use of netbooks in class allowed direct access to the internet for research (product/suppliers data sheets, etc.), for writing up research requirements and for collecting evidence onsite.

I was able to set up a simple e-portfolio for each learner with direct hyperlinks to electronically collected images, audio recordings (taken onsite in real-time by a microphone linked directly to the USB port on the netbook), assessment evidence and assignments for each learner using a Word document. The reduction in the collection of paper-based evidence has now [helped]... to save on paper and printing costs.

Managers' reactions

Senior managers are very supportive of the MoLeNET project.

This has been helping us to move forward with the integration of mobility for candidates accessing work-based e-learning... everything the learner needs to study and to collect evidence is built into the mobile device. The flexibility offered includes work-based collection of evidence, revision and phase tests with a home revision pack and we hope to ultimately integrate with our e-portfolio.

Assessors' reactions

Assessment in the workplace was made easier because pictures of learners' activities could be collected using the camera built into the netbook and audio recordings could be collected using a mobile plug-in USB microphone/recorder direct to the netbook.

I could download the evidence I collected onsite, and via wireless access in college load evidence direct to my own network account and record all the evidence collected electronically.

WBL providers' reactions

Work on the learners' portfolio is completed in a more timely manner and enables all learners to have access to a mobile device away from college. I feel it increases the learners' ownership of their work and in particular their portfolio. Some learners told me how the netbook aided them during revision periods.

Key messages and lessons learned

It is important to monitor what learners are downloading and what is appropriate. Letting users use their own phones to collect image evidence and then download it to the netbook will be the approach in the future. This will save the college connectivity charges and help make use of the netbooks sustainable.

Next steps

This cohort of learners will use the mobile devices from September 2009 with a full year's learning resources available on their netbooks. This will allow the gathering of evidence over a whole year to compare the learners' results against learners without access to mobile devices.

9.4 Using Sony PSP for electrical engineering apprentices key skills

Learning context: FE classroom and work-based learning

Technologies used: Sony PSP

Keywords: assessment, learner confidence, research

Introduction

St Helens College is a large FE provider in the North West. As part of their Advanced Apprenticeship framework all learners are required to complete five Key Skills units at level 2 – three core units and two wider units and gather portfolio evidence as part of the project. During the group discussions use of mobile devices (Sony PSPs) for the wider key skills was suggested. The learner cohort consisted of 10 Electrical Engineering Apprentices aged 16–18 who are linked to local employers.

Intended outcomes

The idea was that learners would use the Sony PSPs to create a video diary recording their outdoor activities. This in turn would be used to evaluate their performance in the problem-solving activities. The evidence and the images collected could then be submitted as part of their Key Skills Level 2 portfolio.



Addressing the challenge

Learners were able to use the devices very easily and quickly, with no real problems.

Outcomes and benefits

The project enabled learners to easily capture all the evidence required. Learners responded in a positive manner to the new mobile aspect of teaching and learning, and enjoyed being trusted to look after the equipment. They demonstrated great enthusiasm and also made good use of the Dr Kawashima's Brain Training games.



Learners' reactions

Learners reacted very favourably: they needed minimal training, and were soon hooked up to the wireless network, researching information in class, creating Skype accounts and using them to contact one another. They also quickly realised that the PSPs could convey information as well as record it, and they began to drive the agenda for the use of the device by asking if tutors could put lesson content directly onto them.

Teachers' reactions

Initial apprehension before the project quickly dissipated once the Sony PSPs were issued and staff could see the improvement in learner engagement.

The use of this mobile technology enhanced the learning experience, and I was encouraged by the amount of enquiries about the project from other work-based learning groups.

Managers' reactions

The project enjoyed firm backing from senior management, and had teachers enthusiastic enough to recognise the potential of the use of this technology. One manager commented:

What a great use of technology, helping students to engage more with their learning.

Assessors' reactions

The evidence gathered was of an excellent standard and demonstrated a more creative method of producing portfolio assessment material.

WBL providers' reactions

At the start of the project, providers were unsure about allowing the use of Sony PSPs, but eventually agreed when they realised the benefits to the teaching and learning experience of mobile technology. Positive learner feedback was given during Apprenticeship progress reviews.

Key messages and lessons learned

Never underestimate your learners! They enjoyed using the equipment and took great care of it. They gained independence in their learning and demonstrated trust in and enthusiasm for this new technology.

Next steps

Next term the college plans to provide wiring diagrams for learners to use in the workplace, and flash-based animations to provide them with short informal assessment opportunities. This will be used to gather evidence in a user-friendly way for their Electrical Engineering NVQ Level 3. Staff training was also organised as part of CPD.

For more information and case studies focusing on work-based and vocational learning see *Work-based and vocational mobile learning: making IT work* (Douch, Savill-Smith, Parker and Attewell, 2010).

10 Young people not in education, employment or training

Ten projects specifically addressed issues relating to young people classified as not in education, employment or training (NEET) or ex-NEET. A number of reasons for young people becoming NEET were identified, including:

- failed school experiences
- few GCSEs
- low self-esteem
- poverty
- inter-generational unemployment
- unstable home and family situations
- peer group pressure
- early learning difficulties.

Many projects commented on the difficulty of attracting this group to formal learning programmes and the need to plan to re-engage such young people.

10.1 Key messages from projects using mobile technologies with NEET learners

- Mobile technologies enabled innovative ways of taking learning out of the college and to the NEETs in projects led by **Accrington and Rossendale College** and **The Sheffield College**.
- The physical act of coming into college was a barrier so **Accrington and Rossendale College** arranged courses in work skills in the community in venues that did not feel like 'college'. As computer facilities were not available in these locations Toshiba Netbooks were used, making the premises into mobile classrooms.
- **The Sheffield College** runs a four-day Enterprise Academy at Sheffield Hallam University, which aims to engage NEETs and to 'get them across the college threshold'. Small groups of attendees are encouraged to think of business ideas and develop them into business plans to be presented to a 'Dragons' Den' of local business people, with prizes for the best plans. They used ultra mobile PCs (UMPCs) and digital cameras for this.
- **The Manchester College** and **Stoke on Trent College** found that mobile devices could also have a positive impact in classrooms and other institutional working spaces. **Manchester** found there was a need for disengaged learners to have 'congenial working spaces'. They also noted that using mobile devices removed wariness or fear of technology: the learners felt they had 'physical supremacy' over mobile technology. Small netbooks were used with level 2 IT/media students who produced digital diaries that were made available to assessors as evidence.

Tutors also made training materials available on the college's 'OurTube' video streaming site. This proved to be a successful new way of working and plans were made to expand the use of video devices for the collection and distribution of materials.

- **Stoke on Trent College** reported better classroom behaviour by NEETs when using Nintendo DS Lites running Dr Kawashima's Brain Training and other games. The greatest effect was on general classroom noise levels both during and after use. This was commented on by everyone who observed or taught the sessions, e.g. 'the classroom was so quiet there was no difficulty gaining attention in a noisy environment'.

The best results came when staff had high expectations, felt comfortable with the devices before the project started and had good IT support.

- **Stoke** also noted easier transition from informal to more formal teaching and group work when using games technologies with NEETs. Early concerns that devices might fuel negatively competitive or inappropriate behaviour proved to be largely unfounded. Teachers reported being pleasantly surprised that there was no 'untoward behaviour by the more lively' students.
- Teachers at **Gloucestershire College** created enhanced learning activities and enriched learning processes using the Sony PSP games devices with the video camera attachment, which helped to engage disaffected youngsters in learning activities.
- Improving communication, overcoming boredom, discovering new skills and software and enabling access to the internet were advantages of the use of smartphones for students at **Tower Hamlets College**. Most of them embedded the use of the MoLeNET smartphones into their daily routines,.
- Selection of the most appropriate mobile technology was important, **Tower Hamlets** found. In some NEET groups a minority of learners who 'could have been influenced by peer pressure' would not use the issued smartphones. In several cases students claimed to have lost them and took no interest in feedback sessions, instead focusing on texting or using their own 'flashier' mobiles. Perhaps a different mobile technology, games technologies for example, would have been more interesting for these learners.
- **Walsall College** had a similar experience with the NEET cohort not engaging with the mobile device at first and concluding that learner engagement could have been enhanced by using Nintendo DSs. Learners using the DSs welcomed the idea of mobile learning and their teachers commented that the sessions were more enjoyable.
- Better achievement and progression were reported by **Truro College**. All their 30 NEET students completed the course successfully and will be progressing to higher level courses next year. They were all reported to be very positive about their experiences. The project manager stated: 'It is impossible to prove the mobile devices contributed directly to their high levels of achievement and retention' but 'it is reasonable to surmise that there was a positive correlation'.
- At **Accrington** and **Rosendale College** mobile technologies were used to support homeless, drug rehabilitation and traveller education groups. Courses in these areas were delivered off the main college site as none of the groups were able to come into the college, but IT facilities at these locations were not good and most of the learners did not have access to computers or the internet at home. Mobile technologies were used to support these learners by creating 'portable classrooms' with small netbooks, a staff laptop, a portable projector, a camera and an internet connection, as well as a variety of freeware software such as Windows Movie Maker, Audacity and Photo Story.

These learner groups tended not to be particularly engaged when using traditional teaching and learning methods, and although most of the learners were not familiar with using technology, this barrier was overcome and learners began to enjoy using and experimenting with the equipment. The tutor responsible for these learners reported that the mobile technologies had had ‘a significant impact on retention and achievement’ and had been ‘instrumental in making the courses the success that they were’. She explained that the devices enabled learners to overcome some literacy barriers they faced with pen and paper-based activities, and that this had encouraged participation.

- **Wirral Metropolitan College** had four NEET learners involved in Foundation Learning provision in sport. They were a difficult group to engage and keep motivated. Games on the netbooks were used to keep them motivated and engaged during the lessons and once all work had been completed, the learners were rewarded with time out playing the computer games. As a result, all these learners remained on programme and achieved.

See Section 13 for further information about the use of computer games and games technologies.

11 Widening participation and non-traditional learners

Eight projects specifically targeted widening participation and non-traditional learners. They reported that mobile technologies can support non-traditional learners and help to widen participation by improving inclusion and access to technology, supporting family learning, engaging learners in learning and contributing to their success.

Inclusion, peer-to-peer support and family learning

Some projects found mobile devices helped to reduce ‘divides’ in education including differences in academic skill levels, social divides including those relating to a learner’s status within a group or class, and digital divides caused by economic background or possibly age.

Technology prompts democratic participation within the classroom, in the sense that the variety of technical possibilities is so broad that the discovery of a new trick or tool encourages sharing, at any level (from the teacher down/from the students up). Within a classroom dynamic, technology encourages the ‘creation’ of new leaders, as it requires skills that are not usually under the microscope in an average lesson. In other words, students that shine in vocational or academic skills could be different from students that have higher technological skills and, in this respect, the smartphone creates a more inclusive environment where a different range of students feel empowered.

...one of the strongest findings of this project is that handheld devices with internet connectivity are very powerful in addressing the digital and generational divide. Their portability allows the students to use them in different settings, engaging with different contexts and social groups.

Peer support has been an ongoing feature within and outside the class. Family support also has been a distinctive feature of the project. In endless cases, adult learners reported how enriching the phone experience has been for the whole family. Children as young as seven have supported their parents (mainly but not exclusively women from Asian, Eastern-European, African backgrounds) in making sense of a new piece of hardware, with its new language and codes. Families have travelled and taken pictures together, have played games, have explored online applications, download facilities, accessed online TV, movie and music in their original language and/or in English, browsed for information (news, maps, products, prices, travel information, etc.). Parents have used the phone as a tool to get their children to do homework and/or domestic chores.

Tower Hamlets consortium

Some learners in outreach centres or work-based environments felt better supported and more part of the college community when using mobile technologies to support their learning and communication. As a result they were more engaged and focused.

Exeter consortium

Improved access to technologies and learning outside college

Mobile technologies have enabled the learning environment to be extended from the college into the learner's home and work settings:

Having the devices allowed skills trainers to take resources into outreach venues and work-based learning environments on mobile devices and these they reported helped to motivate and empower their learners.

Exeter consortium

More mature learners at **The Sheffield College** particularly benefited from being able to access technologies, as unlike some of the younger learners they were generally unable to access technologies through friends or family. One lecturer said:

I intend to explore the maximum possibilities of iTouch as I have found the iTunes portal easy to use and have uploaded photographs and videos of my work instead of having to carry an unwieldy laptop.

Smartphones have enabled **Tower Hamlets** learners to access the internet at home when other members of the household are using the family computer.

Improved learner engagement, confidence and success

... mobile learning technologies and the concept of the mobile classroom contributed significantly to the success of a range of groups who would not traditionally engage with learning. Travellers, the homeless, and learners going through drug rehabilitation all worked with mobile learning technologies to successfully create work as evidence for qualifications in a way that was fun and non-threatening, but gave a strong sense of achievement and in doing so supported the development of increased confidence in own abilities

Accrington and Rossendale College

Learners were supported in outreach venues and in WBL environments by the **Exeter consortium**. They captured evidence of their achievement through audio, video and still images taken by themselves or colleagues. Tutors noted that learners also developed increased confidence in their IT abilities.

Problems encountered

There were issues reported regarding the use of mobile technologies to widen participation and support non-traditional learners. Minor issues such as short battery life and lack of memory space for saving photos or video became major issues in locations where access to extra resources or charging facilities was not available. In other cases changes or differences in priorities or economic situations at outside organisations involved affected some projects badly. Tower Hamlets encountered some resistance to the use of mobile technologies among the more mature learners.

A group of 26 adult students at **Tower Hamlets College** decided not to take part in the project or returned the phone within the first two weeks. The underlying causes could be grouped in the following sets of reasons:

- 'too much responsibility'(11)
- 'I do not want to carry two devices with me' (5)
- 'my device is better' (3)

- 'I still have not learned how to use my laptop at home and I have enough with that' (2)
- general lack of understanding/interest in the project (5).

These reactions suggest a need for more consultation, including involving the learners in the choice of device, and more induction activity when introducing some mature learners to mobile learning.

12 Case studies: widening participation and engaging NEETs

The following short case studies are based on reports from the MoLeNET projects concerned.

12.1 The Manchester College

Learner group

Part of the MoLeNET project focused on 32 level 2 IT/media learners who were classified as ‘ex-NEETs’.

The challenge

Baseline data collected for this group indicated reasonable attendance levels but lower levels of literacy and numeracy and a constant need for supervision and motivation during classroom activities. Within this particular unit learners were required to design websites based on user requirements and to work through a lengthy process of designing questionnaires to gather and collate information about ‘client’ needs. Tutors found it particularly difficult to maintain learner interest and engagement during this unit.

Addressing the challenge

The learning preferences of the group were mixed but most of them showed a preference for audio and visual learning styles, and struggled with the written aspects of the course, so it was felt that mini laptops and digital audio recorders might be useful in supporting teaching and learning. To shorten the process and make it more interesting, tutors used mobile devices that would potentially capture their learners’ imaginations.

Although learners still have to design the questionnaires, feedback from respondents was captured digitally through audio podcasts, and distributed to learners’ MP3 players. The podcasts were used to make the project more realistic: they simulated phone calls from clients, and the learners then played back the podcasts and transcribed them at their convenience. This new process was also used to enhance learners’ listening skills in a fun way. Mini laptops were used to record findings from data collected as well as to schedule action plans using the calendar facility on the system. The main thrust for this cohort was to engage learners in activities through the use of mobile devices and to encourage and stimulate them to work more smartly and independently.

Outcomes

The use of mobile technologies with this group of learners enabled them to work more independently and efficiently. Tutors reported improved learner engagement and tasks completed more quickly and to a better standard. A good example was the recording of video-based evidence with the webcams on mini laptops. This was particularly useful for reviews and evaluations, as learners who struggled to write could produce more coherent pieces. They took less time to document information and build portfolios; and they found the process innovative and more productive.

Learners also recorded audio narrations of their animation work and used them as 'voice-overs' for their animation clips. Video cameras were used for recording group discussions; this again served as an alternative to writing.

Furthermore, the management of the learning process was definitely enhanced by the use of emerging technologies and devices. For instance, as learners became more independent in accessing content and completing tasks, tutors were freed up to better support other learners needing additional help and attention.

Learners' comments

It has made it more interesting and fun when learning

It made it more interesting when the user requirements were given to me in the form of a podcast

It made it more realistic rather than having to write it down on paper

I prefer listening to explanations, so I like it when the user requirement information is given to me in the form of a podcast

The devices made the lessons more interesting and kept my attention within the lesson when the devices were used

Yes it kept me interested and I achieved my goals

Helping me understand things more clearly

It made my work easier by helping me achieving my tasks and also kept me interested on its use.

Tutors' comments

I feel that the learners enjoyed using this more and it encouraged them to stay active in lessons thus influencing them to stay put and achieve what was thought to be a 'dry' unit. Students have been more interested and all have achieved a pass or above.

Individual learning has increased; students are more confident and happier using new technologies on their own

This brought a sense of realism to a project and enabled communication between a client and the designer.

12.2 Stoke on Trent

Learner group

The College worked with NEETs, Prince's Trust students, ESOL students, community education students based in neighbouring colleges, citizenship students and others. Many of these learners had very chequered academic records and had come to college with 'very negative and hostile attitudes and expectations'. Many were antithetical to the idea of being 'kept in school' and regarded their required attendance as an imposition and a kind of punishment. Their behaviour could be extremely challenging, making for a stressful and often unrewarding work environment for the teaching staff involved.

The challenge

Can mobile learning improve an unemployed adult learner's experience and skills set? If so, how?

Addressing the challenge

A range of engagement models were used with these learners and teachers – from brief training sessions for staff in using SMS texting solutions and supporting students in creating Photostory-based artefacts for use in their own phones, to supporting extended usage of devices in classrooms, learning resource centres, community settings, workshops, workplaces and – in one case – up mountains and in tents!

Tutors demonstrated their creativity with some of the games. For example, one game required learners to remember 25 words and then write them down. Many students found this a problem so the tutor negotiated with the group to find a solution. He allowed them to write the words down, which helped to develop their writing ability as well.

The staff decided the model for classroom use independently of the educational technologist supporting the project. They used them in college-based sessions just as session openers and closers to help engage the learners with the staff and to focus attention on tasks that required learners to communicate with each other (getting games started simultaneously, sharing scores, etc.).

This was intended to prepare the group for further task-focused behaviour when the more formal tasks began and the devices were put to one side.

Outcomes

All tutors and support staff who observed or took part in sessions commented that the devices were effective in engaging and maintaining interest, and getting materials into use. Staff commented that they had never before seen these learners staying behind at breaks and lunch to carry on their activities; a 'positive vibe' was created around subjects that learners usually do not find engaging.

Generally, the NEET learners, who may have been already disengaged, initially had low expectations of the ability of the games technologies to support their learning; they seemed to make clear distinctions between playing and learning. Their positive experiences were quite a revelation to some of them. There were excellent results in improving their general capacity and motivation to engage with learning processes. Not only did their mental maths skills improve but they overcame specific difficulties, for example with punctuality. Behaviour improved dramatically too. Learners – even those who had expressed no interest or even positive antipathy to the devices at first – were universally positive in their perception that value has been added to their experience of learning.

There was clear evidence that all staff experienced improvements in the general behaviour and classroom conduct of their learners. Some said it was ‘beyond their expectations’ and that the ‘experiment’ had been a success, even though they had only used the devices for a fraction of the time expected. On occasion, during brief visits to observe and interview, the researcher found it striking that classes that had been before the use of gaming devices rather lively with noise, disruptive behaviour and a constant need to engender, encourage and support task-focused behaviours were now virtually silent and focused on the task in hand without any need for the tutor to monitor and constantly refocus attention and manage off-task behaviours. Much learning-oriented behaviour was also observed between peers in the cohort with choruses of ‘shush’ and similar behaviour directed towards those who were slow to focus. Tutors reported changes in group dynamics towards greater ability to communicate and collaborate and changes in the ‘pecking order’ as some lower status individuals demonstrated expertise and the ability to share their knowledge with the rest of the group.

Furthermore, the enhancement of the learner/tutor relationship brought about by the change in power structure and control in the teaching setting was clear. Learners enjoyed the democratisation of being ‘the expert’, and tutors generally responded very well to this change. The community-based settings in which a lot of the work was done might have been a factor – being away from the formal teaching situation seemed to make for more open and friendly relationships between cohort and tutor. Projects that took place in the more formal settings of the college buildings also demonstrated this pattern to a degree.

The relatively small difference in age between learners and tutors seen in the NEETs-oriented provision seemed to have been a strong factor: a mutual interest in the gaming devices in particular made for an easy transition to using the devices within the teaching setting, given familiarity on both sides outside the classroom.

In terms of learner attendance, of course, it is very difficult to assign with confidence the degree to which any change was due to use of the devices but there was improvement across the entire cohort. Specimen cohort records (two construction groups, one motor vehicle group and one ITCH group) showed an average increase in attendance of 10% over the period. The different approach to learning showed a rise in confidence and students staying until the end of the sessions without complaining. For example: one student had problems with subtraction but using Dr Kawashima’s Brain Training game increased his motivation and subject confidence and he became an excellent attendee.

MoLeNET has started processes that are going to have a profound impact upon how we relate to learners and how we offer teaching opportunities. A spirit of fun spread throughout other groups and staff when observing the positivity from using the Nintendo DSs and this has resulted in allowing students to unwind and take frustration out in a positive way.

12.3 Truro and Launceston colleges

Learner group

Truro College involved 103 students and 32 staff in the MoLeNET project. The devices were Samsung Omnia smartphones and students were selected from areas including First Diploma in information technology (20 students) and First Diploma in media (11 students). Both these groups would be classified as potential NEETs based on their generally poor GCSE results with a significant number having personal domestic problems.

Launceston College, which is a secondary school, involved 140 students and 12 members of staff. Their students were selected from faculty areas including design technology, art and photography, construction, hospitality, child development, hair and beauty, agriculture, public services, music and drama and some were potential NEETs. They used three devices: Samsung Omnia, Apple iPhone and the Nokia E71.

The challenge

To support engagement and achievement in vocational Diploma-related subjects.

Addressing the challenge

Truro College used smartphones with their potential NEET learners to support practical work in IT workshops and the collection of photographic data for media portfolios. Learners at **Launceston College** used smartphones for a wide range of activities including completion of assessment activities for portfolios, peer-assessment activities and creating learning resources for other students.

Outcomes

The project enabled students to research, action and record their learning activities whenever and wherever. The tutors' reactions to the progress in and outside lessons were very positive and students were engaged by technology, which enabled them to produce effective learning materials. The mobile devices also allowed flexible assessment so that students with weak literacy could visually capture evidence for their portfolio and improve their achievements.

Both teachers and learners, especially those at risk of becoming NEET, have been re-enthused about the process of learning.

All of these factors contributed to improvements in the achievement of students statistically and socially/emotionally.

Teaching and learning activities and resources

The MoLeNET project 'reinvigorated' the teaching and learning pedagogy of many members of staff. The introduction of new highly technologically productive devices such as the iPhone or Omnia encouraged even more members of staff to begin asking about introducing this technology to their subject area. Some teachers were initially intimidated by the complexity of the mobile devices and the need to learn how to use them but as the project progressed understanding of how they could change the learning experience grew. Teachers used existing systems in new ways— they accessed features on the Moodle VLE such as uploading resources and creating interactive games and assessment for learning tools.

Truro College already had a close relationship with learners and the launch of college Moodle VLE enabled flexible access to material, but the MoLeNET project took this one stage further, enabling teachers to learn from students and students

from teachers. New ways to support learning and an increasing amount of resources were created as a result of this fusion of ideas and they will enable future generations within the college to become increasingly more technologically advanced. For example, a staff group was formed to prepare a complete set of learning resources and assignments for level 3 National Diploma students studying ITCH next year. One unit of the Diploma was developed to focus specifically on the use of mobile technology and students will be producing learning resources as part of their assessment portfolios.

Students created a vast bank of teaching and learning resources for themselves, other students in the college and students in other learning institutions locally and nationally; the number of learning resources created within each subject area also increased massively. Students became more proactive about creating learning resources and developed the technical expertise to do so. Resources and opportunities to support learning included:

- Photographs/video: these were used in assessment and as evidence of individuals' assessed work. Footage was used to compare different students' performance and the performance of individual students over time. Construction tutors commented that the devices have enabled the industry to 'come into the classroom' when students bring in pictures and videos from their workplaces to be used in lessons.
- Documents, spreadsheets: Learners on field trips and visits used these to create case studies and resources. They also downloaded materials from the college VLE to work on at home.
- Voice recordings: These were used to log students' role play, customer service scenarios and interviews. They could then be used as evidence and best practice examples for other students.
- Calendar entries and to-do lists: All students used these daily to help their organisational skills.
- Emails: Students tended to use these through their personal accounts and linked their school e-mail account to their mobile devices. Being able to 'sync' the devices to the college network enabled effortless transition between home and college.
- Phone conversations: Students texted and phoned each other frequently outside school hours and were therefore able to collaborate and support each other more than they otherwise would.
- GPS mapping: The mapping application was used on a Year 10 field trip to get a very useful GPS fix of the 12 river stations, which enabled the learners to complete their coursework. These will be pinpointed again next year and the same data can be collected to compare/contrast from exactly the same spot! This will enhance the technological requirement of the coursework criteria on the syllabus.

The mobile devices made the teaching and learning process much more interactive and this benefited the learners enormously. As part of a BTEC First Diploma in hospitality, for example, students were set a project assignment on their Samsung Omnias as part of a visit to the Rick Stein group of companies in Padstow, Cornwall. The tutor of this course noted that in the usual PC-based classroom environment this project could have taken 6–8 hours of introducing, researching, analysing and writing up, which could last up to 3–4 weeks. However, the day visit (between 10am and 2pm) proved enough time to complete the project, including talks and demonstrations from staff (and fish and chips!). Reports completed during the day were not only highly engaging but also written in a very professional way, which was not usually a key feature of work presented on a post-16 level 2 qualification.

Teachers' comments

From my point of view the introduction of this mobile technology has made the biggest impact on my teaching in the last 10 years. I have been able to download materials onto the VLE from any point in the world. I have uploaded and downloaded materials from the top of the Alps at half term! I have been able to take pictures of students' work and email this to others. Students have communicated with me and others in a more constructive way.

There is no doubt that mobile technology has a place in the classroom and I have a number of ideas for implementation next year.

Assessment

The use of mobile technology brought about two key changes in the college: the first was the introduction of the devices themselves and the other was the introduction of qualifications using more flexible assessment approaches, such as BTEC qualifications. The combination of these factors led to a dramatic increase in the range of assessment opportunities. For example, students used video and audio recordings of interviews with external members of the community to create a portfolio for their qualification. Recording live events as they happened rather than hearing about a topic then writing it up at a future date was hugely engaging for the learners and being able to visually capture evidence allowed students with poor literacy skills or English as an additional language to access higher grades.

In construction, photography and childcare, tutors reported an increased use of photographic evidence and presentation as part of coursework portfolios. In construction specifically the tutor stated: 'the photos are discussion points within their friendship groups, aspects of day-to-day site works are brought in and relevant points of application or methods are discussed as a result of them'. Photographing other students' work enabled more effective peer assessment and improved assessment for learning in many of the learning environments where mobile technology was operating. Furthermore, First Diploma in IT students used the phones to produce high-quality evidence of their practical skills in the installation of hardware in computers.

Teachers' comments

Several of the topics studied, and the nature of the BTEC courses we are running, open the opportunity to evidence situations and assessments through audio, visual and video recording. We have used these media to evaluate group work, reflect on students' input in group work and also analyse students' performance (e.g. students were asked to role play as police officers in a potentially volatile situation). Students were engaged by the physical nature of the tasks already, however the ability to assess through these media (and show the live footage and recordings back to students) was very powerful in terms of students seeing first hand how to improve their learning. Also, recording can be done from a variety of viewpoints, which in some situations such as the role play outlined here, also really added to the evaluation.

Students on this course tend to prefer physical activities as opposed to writing, and having this freedom to assess through evidencing with their own video, visual and audio recordings really suits their learning styles.

This method has encouraged some students who found they trashed their paper evidence in the past on the morning journey to the college, to now be able to print it here and have immaculate work to hand in for element evidence. This method has made them take more pride in their evidence folder portfolio work overall.

The project opened up the debate between teachers and learners about the flexibility of more technology-based portfolio systems and evidence. Teachers had come a long way in their own development by taking on the mobile learning project but were keen and enthused to further develop their skills in mobile learning. They are now exploring ways of further incorporating this technology into all aspects and all stages of learning to further aid the learning of students.

Engagement

The devices enabled the use of a variety of alternative teaching and learning strategies, but the devices themselves and personal possession of them also had a big impact on students' learning experiences. Given the rural locality and local employment prospects in Cornwall, limited use of technology and the backgrounds of the learners, for some of them this was their first engagement with mobile technology and it energised and enthused them. Tutors reported the excitement when the phones were first introduced, which grew with the development of features such as applications (apps) on the iPhone and the Microsoft Office package facility on the Samsung Omnia.

Students engaged with the devices in a way never seen before. They took complete ownership of their mobile devices and were enthralled by the opportunities they offered. Their reaction astounded the college and improved the ways students and teachers interacted to develop teaching and learning opportunities. One of the reasons for this massive shift was the introduction of technology such as an iPhone to students that had never had access to these sorts of devices before.

It is clear that the students felt that they had been given a unique opportunity to involve themselves in the development of their teaching and learning using technologies that they are comfortable with in their everyday existence. There were several individual examples of students who changed their attitude to study and improved their overall performance after the phones were issued. One student with serious anger management issues responded very positively: he successfully completed the course and is on track to progress to a level 3 programme of study against all predicted opinion.

A significant number of students in the first phase of the project were on two-year courses. Almost without exception they requested to be allowed to keep the devices for use in their second academic year. The interest in using mobile technology spread across both institutions and some staff are now seeking an opportunity to take part in the next phase of the project.

Learner achievement

The mobile technology had a profound effect on the learning of students. Students using the devices saw their predictive grades jump far more than those not using the devices. An analysis of the final results for First Diploma media and First Diploma IT students at **Truro College** showed an increase in merits and reduction in just pass level grades. At **Launceston College**, subject areas produce a half-term progress statement on the achievement of students. The results revealed that 87% of the students who used their mobile device achieved higher grades than those who did not have a device.

Qualitative data obtained from tutors also revealed that those with devices made more progress than those who did not and that there were many demonstrations of hidden talent by learners who might otherwise have become disengaged. Key reasons for this, identified by tutors, included:

- being able to deal with issues instantly

- flexible assessment methods – more scope for creative collation of evidence, i.e. photographs, visual, auditory
- being able to type answers rather than writing findings up – better suiting the learning styles of the learners involved in the project
- downloading materials from various locations in and outside college
- students taking more pride in their work
- having a storage device for use between college and home, i.e. downloading material from the VLE and taking it home (given that students do not always have internet access at home)

Furthermore, the research showed that learners had had a variety of positive learning experiences with their phones, which they believed had had a significant impact on their achievement. The main reasons identified by learners for the positive impact on their achievement were:

- better communication between teacher and learner
- being able to access the internet 24/7 no matter the location for research in assignments
- being more organised; using the calendar to plan times/deadlines for assignments
- using the device to take photos as part of evidence for portfolio-building
- being able to instantly type up notes while witnessing or conducting an activity, i.e. work placement
- having the mobile device at all times and therefore having opportunities for spontaneous activities such as filming and photography which would have otherwise been impractical.

The following two figures 25 and 26 show learners' opinions on how useful they found the mobile devices with their learning.

Figure 25 Potential NEET students at Truro College

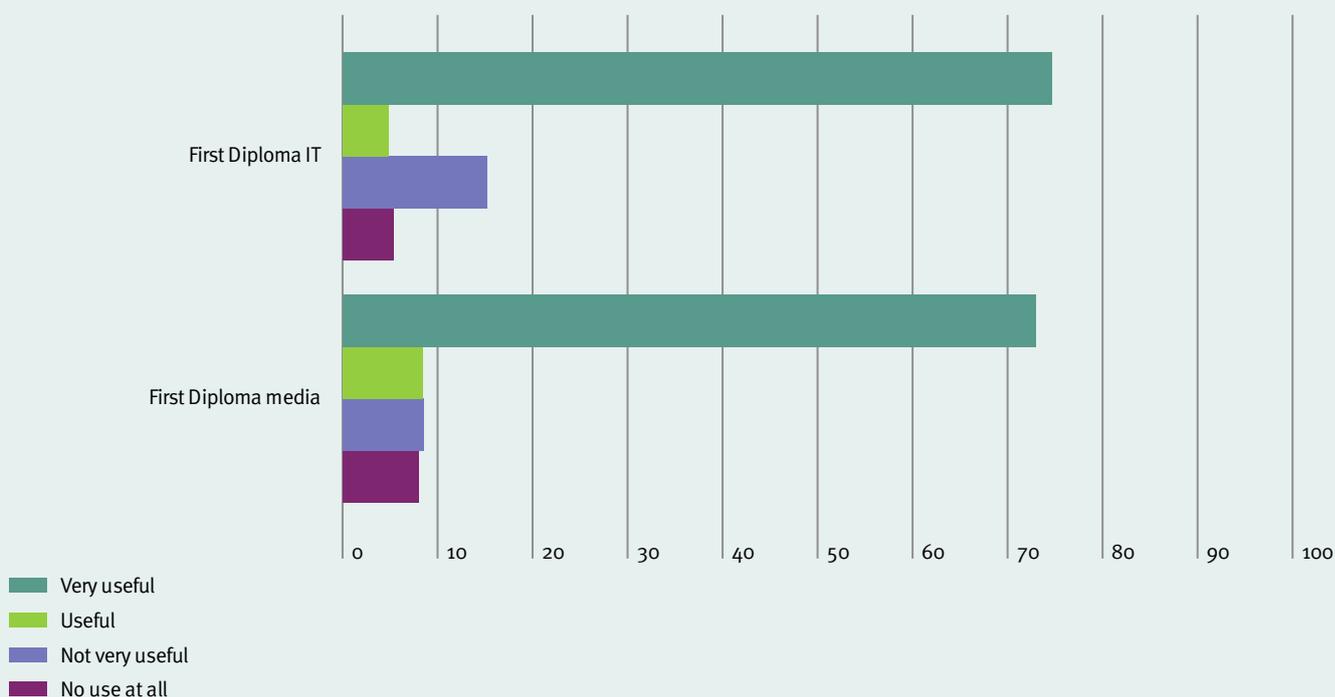
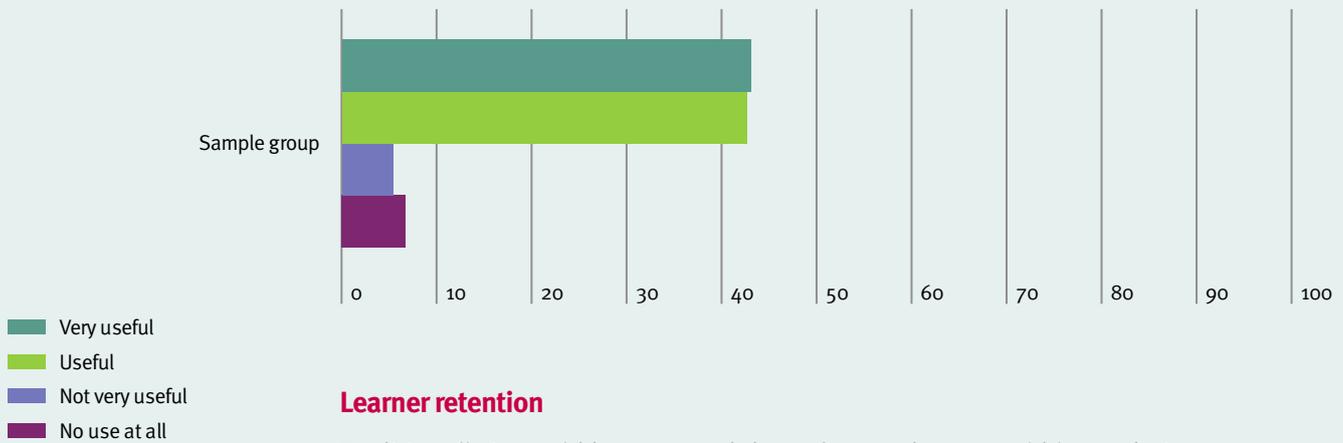


Figure 26 Sample learners, including some potential NEET learners, from Launceston College

Learner retention

Traditionally it would be expected that a few students would leave their course, especially students on the level 2 post 16 First Diplomas who are at greatest risk of becoming NEET. One of the key outcomes at **Truro College**, however, was that after the handing out of the mobile devices no students dropped out of any of the courses involved in the project. Although it would be speculative to assume that the two factors were linked, the technology did engage their interest in learning and created a passion for using the devices; and the sense of excitement and personal trust demonstrated by the issue of these expensive devices might well have also contributed to improved retention.

Almost all the 240 students involved in the project were either continuing their programme of study in September or progressing to a higher level programme. Students and staff who had not been involved asked if they could take part in the next phase. This indicated the enthusiasm and interest generated in this first project which was spreading throughout the institutions and will lead to a greater use of mobile technology in the future.

The technology also boosted the recruitment levels of courses both post- and pre 16 as details of the creative technological approaches filtered down to other students. Students and staff have begun using their mobile technology as a matter of course.

12.4 Walsall consortium

Learner group

The project involved 115 learners and 12 staff. The learners who took part were from various backgrounds and included disaffected and disengaged youths and learners with negative experiences of education. The borough of Walsall has a history of continued high unemployment and a culture of low aspirations and negative experiences of education.

The challenge

With the help of MoLeNET **Walsall College** and its partners aimed to improve teaching and learning by developing a programme of study within 'Achieving Together', concentrating on using Nintendo DS Lites and their educational games. They hoped that mobile devices would be effective in re-engaging the hardest-to-reach learners on the School Engagement Programme (SEP).

Addressing the challenge

The staff in the 14–19 department embraced innovations that could help in teaching and learning. One member of staff worried that it would mean extra work and training but their fears were soon dissipated as a MoLeNET Champion was appointed to charge devices, train staff and give assistance when needed. The project was a standing agenda item on the weekly team meetings so that all staff could discuss areas for development and successes.

As a key part of its role within the college, SEP sought to establish positive links with other local organisations such as schools and training providers with an interest in young people, their education and their welfare. They thought that m-learning would and could engage learners and the research specifically aimed to see how Nintendo DS Lites might help learners with their studies. The project also aimed to improve teaching and learning by adapting SRS systems, recording equipment, E-PCs and MP4 players in lessons as well as outside college.

The induction week consisted of a one-hour talk introducing the aims and outcomes of the course to the learners. The first week was broken down into two sessions in which learners were split into teaching groups and the programmes then ran for five months. Learners were presented with an in-house certificate for achieving 95% attendance and punctuality, meeting behavioural targets and proving their commitment. These factors, it could be argued, are crucial for achievement as without them qualifications would not be gained. These factors were also expected to follow through to their school-based education, to show that the 'Adult Literacy and Numeracy M-Learning' programme was enhancing their full-time course progress as well as keeping them on the programme as an end in itself. Finally, at the end of the project learners were considered for awards including Student of the Year, Star Award and Class of the Year.

Outcomes

Schemes of work and lesson plans were adapted to integrate mobile learning using the Nintendo DSs, and the impact on re-engaging learners was substantial. For the first time for a significant number of learners, they were fully engaged in a programme of education. Overall attendance for sessions on the project over the weeks was an impressive 95 – 12% increase in a cohort which was among the most difficult to engage within a classroom environment. Learners felt that tutors made lessons more fun during the m-learning sessions, and the deputy head at the partner school stated: 'This programme has seen learners enjoying education again and the number of exclusions in Year 10 is down by 65%, this programme can certainly take some credit for this.'

In terms of supporting the learning experience and skills development, 85% of learners said that they believed that the MoLeNET project had assisted with the course and 87% of learners welcomed the extended use of devices in other lessons. The success rate of learners in 2007/08 was 76%, which was 4% lower than the college target. The achievement rate for this cohort was 100% meaning that the overall success rate jumped from 76% to 90%. For many learners, the qualifications from the short courses are their first formal qualification and the rise in self-esteem in those learners is immeasurable. There is no doubt that m-learning played a considerable part in this success.

In terms of progression, as part of the mobile learning programme the learners were encouraged to focus on a progression pathway (part of the Foundation Learning reform). They had one-to-one sessions with tutors to identify possible routes to their career aspirations. They then followed their programme of study for 2008/09 with the target of accessing Foundation Learning in 2009/10. All learners chose their programme of study, which included the fundamental three strands of Foundation Learning (functional skills, vocational knowledge and personal and social development), and the idea was that **Walsall College** would deliver all components to the SEP Group in 2009/10. There was also a pastoral programme to support learners through the year, which included one-to-one weekly tutorials. They will allow any issues or areas for development to be identified and action plans with SMART targets for learners to follow.

13 The impact of games technologies

Eleven projects used games technologies, such as Sony PSP and Nintendo DS, in their projects. They enabled:

- provision of fun, interactive and engaging learning activities
- provision of differentiated learning activities
- capture of photographs and videos for review, evidence and resources
- provision of activities for study breaks and downtime
- support for learners with learning difficulties and disabilities
- support for the development of numeracy skills
- support for communication.

The **Aylesbury College consortium** that used the Nintendo DS highlighted the fun factor and also appreciated the technology's good mobility and variety.

Chichester College consortium found the Nintendo DS Professor Kageyama's Maths Training games significantly contributed to improvements in learner numeracy. The automatic recording of results on the devices provided a record of quick progress through continued practice.

Learners at **Ealing, Hammersmith and West London College** enjoyed using Professor Kageyama's Maths Training games to self-assess their multiplication skills on the Nintendo DSs. They reported using the devices during breaks, at home and travelling to and from college, in some cases in collaboration with others.

Gloucestershire College was impressed by the functionality of the Nintendo DSi and the Sony PSP. They used the DSi successfully to improve numeracy skills and used the cameras and playback features on both devices to record images and videos for review, presentation and resource creation purposes.

The **Joseph Priestley consortium** was already using the Nintendo Wii games console with learners with learning difficulties or disabilities. Their MoLeNET 2 project enabled them to add the Nintendo DS Lites that were used with cookery programmes to assist these learners in following and creating recipes and providing evidence for their qualification. The **Joseph Priestley consortium** also used games in Windows Mobile as ice breakers or for relaxation with Train to Gain learners. This was useful during breaks and for building confidence and skills.

At **St Helens College** handheld games technologies 'captured the imagination of both learners and teachers'.

The Nintendo DSi and Sony PSP were used at **The Sheffield College** for enrichment activities including use of the web browser and camera and practising skills through games. They used the Pictochat communication tool for practising spelling as well as for exchanging questions and feedback when using online interactive content. PowerPoint presentations in .jpeg format were loaded onto the PSPs to enable learners to review information while they were on the move.

Walsall College consortium used Professor Kageyama's Maths Training and Dr Kawashima's Brain Training games on the Nintendo DS Lites to support the development of mental arithmetic skills. They reported that learners enjoyed the games and when used as a warm-up they improved learners' alertness.

Wirral College used Professor Kageyama's Maths Training games on Nintendo DSs to provide differentiated learning activities. These helped to engage and retain the focus of the learners who were able to concentrate on their learning needs and compete against themselves to improve further. Nintendo DS games were also useful for reinvigorating NHS NVQ employees at the end of a long day in preparation for learning.

Further information about the use of games technologies for teaching and learning, together with case studies from MoLeNET 1 and 2, can be found in LSN's publication *Games technologies for learning, more than just toys* (Douch, Attewell and Dawson 2010).

14 Health and safety and learner behaviour

14.1 Health and safety concerns

Five projects reported that learners had refused to take part in MoLeNET because of safety concerns; 24 students were concerned about the possibility of theft or mugging; a further 3 were concerned about losing or damaging a device. This represented only 0.25% of all learners involved, with no reports of learners refusing on the grounds of perceived health risks. One college also mentioned some issues for learners using cameras in the workplace including concerns about data protection and security risks at childcare placements and in an airport, and a concern about the possibility of spreading head lice through sharing headsets.

14.2 Inappropriate use of mobile devices

Only two projects reported incidents of inappropriate use of mobile devices by learners. This included one learner uploading an inappropriate image to a UMPC, (they were reprimanded) and another attracting a very large phone bill after signing up to a texting service. This learner subsequently paid back some of the cost to the college. One project mentioned that one member of staff was concerned that the cameras could be used to upload inappropriate learner images to social networking sites but no such incidents were reported.

There was one recorded incident of bullying due to 'device envy', with the bullying committed by a 'known bully'. Just over half the projects reported staff members' concerns that incidents such as these might occur but this only resulted in restrictions on the project in three cases. These restrictions included detailed release forms for staff and students and security restrictions so that devices could not be connected to a learner's own router and FLV (Flash for video) videos could not be downloaded. These restrictions resulted in some irritation and ongoing system updates. There were also delays caused by concerns within the IT department over the type of video content that might be uploaded to the server.

Recommendations from projects included:

- reinforcement of acceptable use policies
- careful logging of equipment use so any inappropriate use could be traced to a particular learner
- the need to develop policies and guidelines for the use of Web 2.0 services
- purchase of data-only contracts for smartphones to avoid learners generating large phone bills
- development of fixed dialling from smartphones
- discussing security restrictions put in place by service providers and IT departments to ensure they were appropriate but not too restrictive.

Most institutions involved in MoLeNET 2 had updated or rewritten their acceptable use policies and/or learner contracts, or planned to do so in the near future, as they recognised that their documentation was no longer sufficient.

One project reported that they had been pleased with the T-Mobile office link service because it made sure that internet connections were routed via the college proxy and firewall, thus preventing access to inappropriate sites.

Another project explained that their concerns over possible psychological bullying passed after it became clear that learners were working together to make the most of the devices and that they in fact promoted positive peer relationships. Several colleges reported that their initial concerns soon disappeared and one project manager commented how impressed they had been with the level of maturity shown by learners.

14.3 Damage, loss and theft

Sixteen projects reported that some mobile devices had been damaged, lost or stolen, but in total only 32 devices were damaged, 18 lost and 31 stolen. This represented less than 1% to all devices purchased.

Many of the projects explained that learners were required to sign a form confirming that they would return the device at the end of the year, and in some cases that they would replace or pay a fine for a damaged, lost or stolen device. In a few cases, however, such forms did make some students reluctant to take part.

On the rare occasion that a non-accidental incident occurred, institutions followed their disciplinary procedures and reported incidents to the police where necessary. In some cases insurance policies did not cover the loss or theft of devices and alternative policies appeared expensive. One project was investigating the possibility of covering learners under their parents' household insurance.

Some devices had not been collected in as learners had been entrusted with them over the summer or until their course was completed. Many projects suggested that giving learners responsibility for the devices and the sense of being trusted and valued had helped to reduce the number of incidents. There was no evidence of projects selecting only learners deemed to be more responsible or older to take part in mobile learning projects.

14.4 Learner behaviour

When considering introducing mobile technologies into the learning environment a common concern of teachers was that it might have a negative effect on learner behaviour leading to classroom management issues. MoLeNET research findings, however, suggested that if learning is carefully planned and monitored and the devices are appropriate these problems rarely arise. In fact, the opposite effect is often observed: all projects that commented said the mobile technologies had had a positive effect on learner behaviour.

Joseph Priestley consortium reported concerns among staff that mobile technologies might adversely affect learner behaviour; these fears were often based on their experiences of learners' use of their own mobile phones in the classroom. However, in practice, their experience of introducing a tutor/learner texting system as part of their project was very positive:

In the care area, learners were happy to let their tutors text them for assignment support, and preferred to communicate with the college in this way rather than ring reception. Feedback was that a direct link to the tutor was much more appreciated by learners. In one case, a tutor texted her group when they were working in the learning centre, letting them know that their session was finished, but adding, as a joke, 'why is your mobile switched on in the learning centre?'

Negative staff attitudes were changing rapidly as feedback indicated improved learner behaviour.

Tower Hamlets consortium found that it was important that teachers were engaged with the mobile technologies because this affected the way they were and the learners' experience, which in turn affected learners' responses and behaviour.

Some examples of improved behaviour are provided below, many of which show that more engaged and focused learners behave in a more appropriate way.

14.4.1 Improved engagement with and commitment to learning

Learners at **The Sheffield College** took more pride in their work and were more determined to do well when they knew they would be using the mobile devices to photograph the final product for their portfolios. Staff also added that learners were more engaged with learning outside the college: 'My students didn't mind doing maths training on the tram as it didn't look like work.'

Stoke on Trent College explained that addressing the challenging behaviour often displayed by NEETs was a major factor in engaging them with education. They reported that using mobile games technologies helped address this issue; learners had become much more willing to engage with, and focus on, learning, and these benefits had been sustained rather than temporary..

Joseph Priestley consortium reported improvement in learner engagement to the extent that learners asked to be allowed to keep the PDAs over their break in order to continue with work.

Walsall College explained that learners had become more focused and behaviour had become easier to manage; there was a noticeable reduction in learners having 'time out' because of disruptive behaviour in the classroom.

Gloucestershire College reported:

The devices have given us an effective tool to engage with potentially disaffected learners and therefore to optimise their potential. For example, students on the plumbing courses became 'bored' with undertaking paper-based revision for their exams. By adapting and using Activexpression, the revision became vibrant and engaging with a resulting increase in achievement in the exams.

14.4.2 Improved participation

Exeter consortium reported that learners undertaking public service and level 1 childcare courses using UMPCs had become much more focused and active. In effect the mobile technologies had 'enhanced the learning process by transforming learners from passive recipients of information to active constructors of knowledge'. Learners enjoyed the interactive nature of the lessons and commented that they liked the group activities and gaining immediate access to information.

Stoke on Trent College reported that learners had used the PictoChat function on the Nintendo DS to build communication skills.

The following explanations for improved learner behaviour were provided:

Grimsby Institute of Further and Higher Education found that students had taken ownership of the devices and their learning, and with the device seen almost as a personal possession, behaviour had been very positive.

St Helens College reported that staff felt that learners' behaviour had improved because they no longer had to wait around for resources to become available.

Cornwall consortium foundation studies learners used cameras to video themselves and to review their own behaviour. They reported that this helped the learners to identify and evaluate how their behaviour appeared to others and to understand terms such as 'aggressive', 'teamwork', 'disruptive' and what these behaviours look like.

15 Learner and teacher reactions to mobile learning

LSN used two text message surveys to collect firsthand feedback on the experience of mobile learning from learners and teachers involved in all the MoLeNET projects.

The surveys were built using a Tribal Group plc system designed for authoring text message quizzes. Both consisted of six questions (labelled A to F) with two or three numbered multiple-choice answers for each question. Institutions were also provided with a unique code identifier. A prize of an iPod Touch for one teacher and one learner was offered to encourage participation.

In a few cases institutions collected answers to the questions on paper, or via an online questionnaire, as they felt that this would maximise participation and avoid learners and staff incurring the cost of the text message.

15.1 Learner SMS survey

Flyers (see figure 27) and supporting posters were sent to institutions to advertise the survey, ask the questions and explain how to respond.

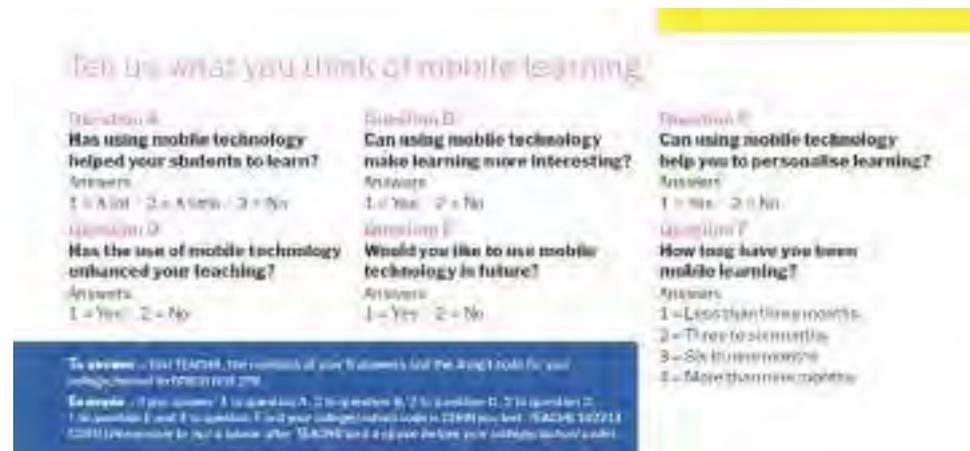
Figure 27 Learner SMS Survey flyer (back)



15.2 Teacher SMS survey

Flyers (see figure 28) and supporting posters were sent to institutions to advertise the survey, ask the questions and to explain how to respond.

Figure 28 Teacher SMS Survey flyer (back)



15.3 Analysis

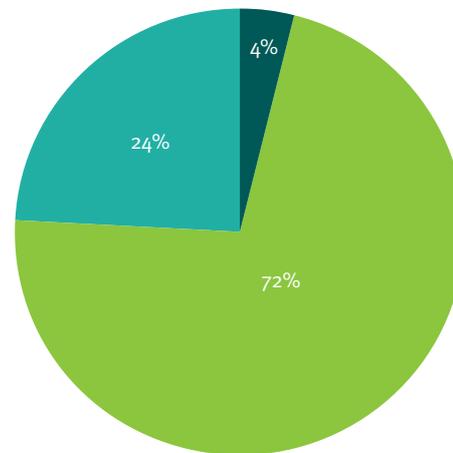
Complete responses to the surveys were received from 795 learners and 116 teachers across 35 institutions. This represented 7% of all the learners identified as involved in the project and 6% of all teachers, across 71% of all institutions involved in MoLeNET 2.

15.4 Learner SMS results

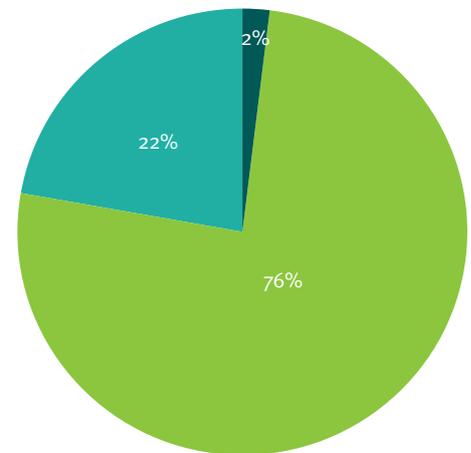
- 96% of learners felt that using mobile technologies helped them, or helped them a little, to learn (see figure 29).
- 98% of learners agreed that using mobile technologies can make learning more interesting or a little more interesting (see figure 29).
- 90% of learners felt that mobile technologies helped them to learn in different places.
- 89% of learners thought that mobile technologies helped them to learn at different times.
- 95% of learners said they would like to use mobile technology for learning in the future.

Figure 29 Helping learners to learn and making learning more interesting

Does using mobile technology help you to learn?



Can using mobile technology make learning more interesting?

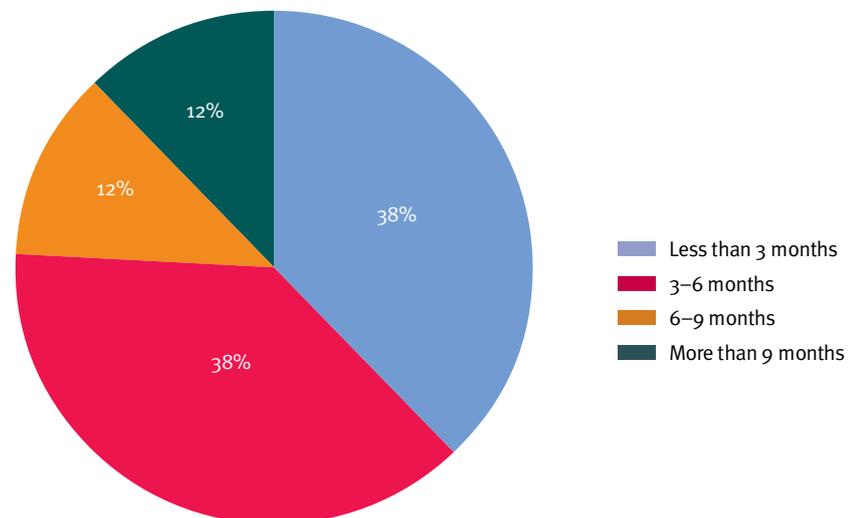


Yes A little No

Information about how long learners had been involved in mobile learning (figure 30) was used to gain an impression of whether initial positive reactions were transitory.

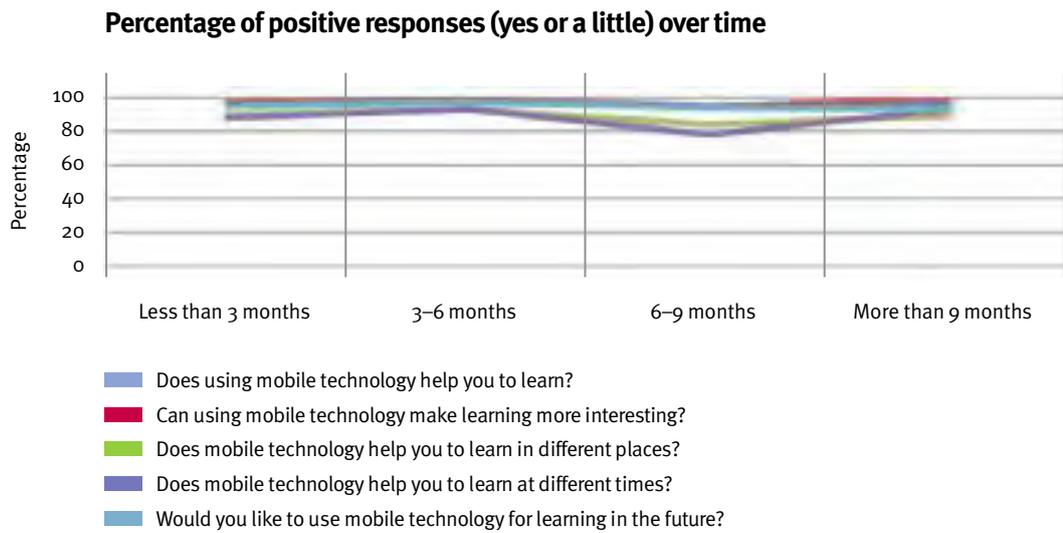
Figure 30 Time involved in mobile learning

How long have you been mobile learning?



The data indicated no decline in positive responses over time (see figure 31). This suggests that there is no novelty or Hawthorne effect, or that such an effect takes longer to be realised than the timescale of the project.

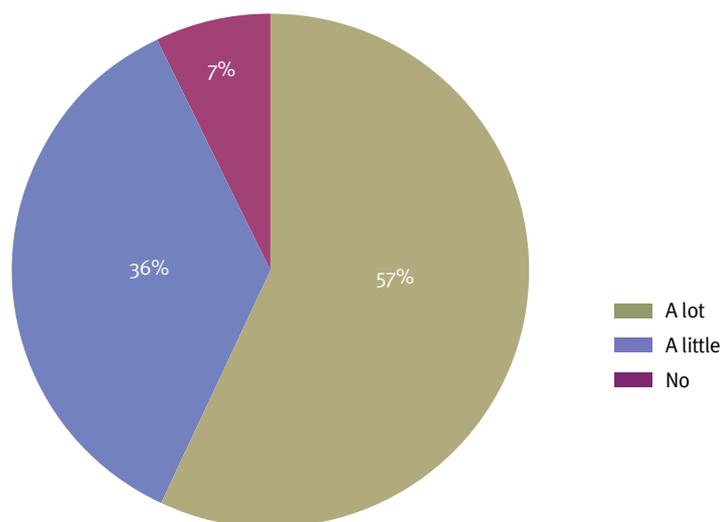
Figure 31 Positive responses over time



15.5 Teacher SMS results

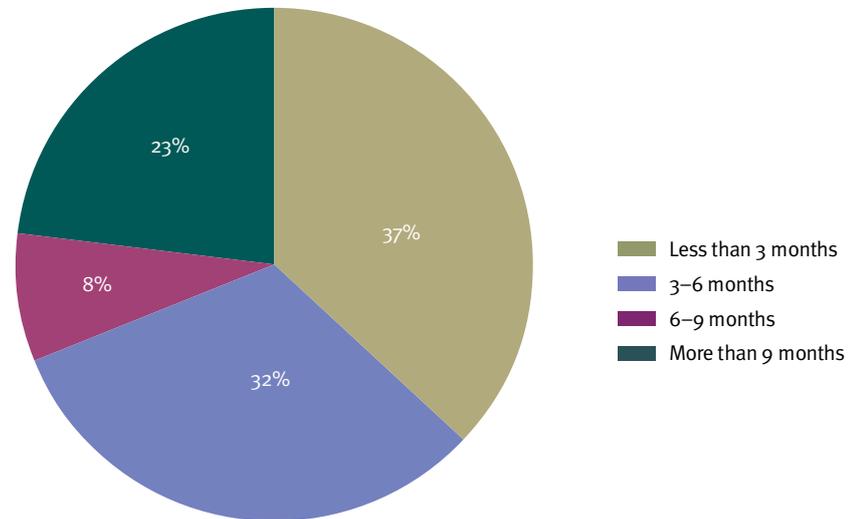
- 93% of teachers felt that using mobile technology help their students to learn, with over half reporting that it helped a lot (see figure 32).
- 91% of teachers believe that using mobile technologies can make learning more interesting.
- 94% of teachers believe that using mobile technologies can help them to personalise learning.
- 88% of teachers felt that the use of mobile technologies enhanced their teaching.
- 94% of teachers would like to use mobile technologies in the future.

Figure 32 Helping students to learn



Information about how long teachers had been involved in mobile learning (figure 33) was used to gain an impression of whether initial positive reactions were transitory.

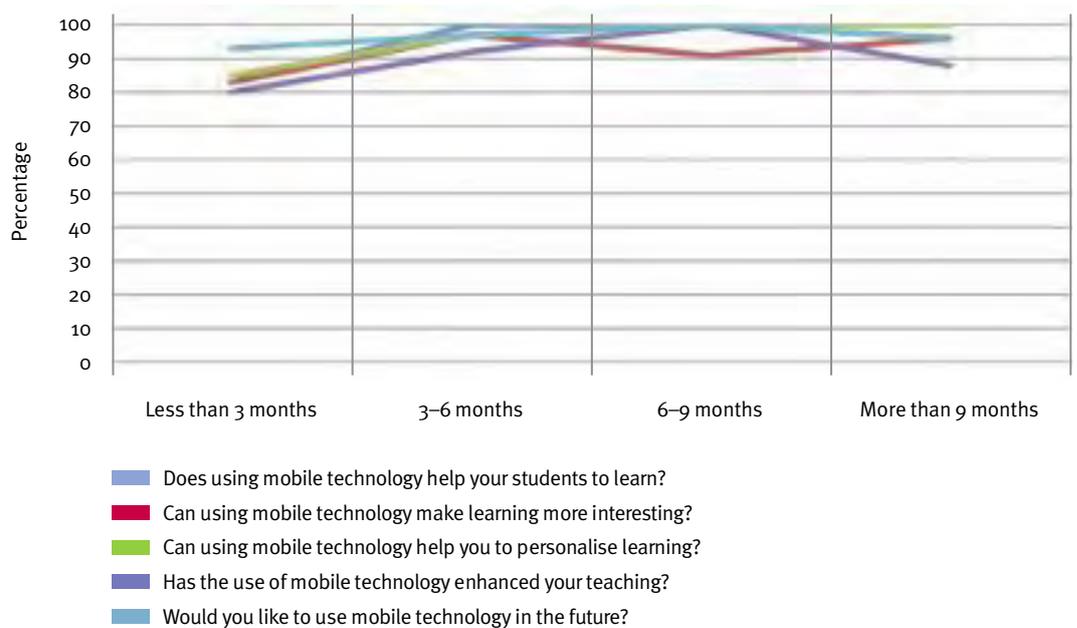
Figure 33 Time involved in mobile learning



The data indicated no decline in positive responses over time (see figure 34). This suggests that there is no novelty or Hawthorne effect, or that such an effect takes longer to be realised than the timescale of the project.

Figure 34 Positive responses over time

Percentage of positive responses (yes or a little) over time





16 Distance travelled by MoLeNET 2 colleges ('m-maturity')

Institutions participating in MoLeNET in 2007/08 were asked to complete a simple self-assessment exercise (the m-maturity survey) on three occasions (before the project, during the project and after the project) to assess the distance they had travelled towards embedding mobile learning. In MoLeNET 2 institutions were again asked to complete this survey on three occasions.

The development of the research instrument used for these surveys was informed by the MIT90s framework, particularly Venkatraman's five levels of business transformation achieved through IT (Venkatraman and Henderson 1993), which had also informed e-learning benchmarking and e-maturity work by UK education-sector agencies such as Becta.

Key contacts for each of the participating institutions were asked to consider four areas – senior management, teaching staff, IT department and the institution as a whole, to self-assess the status of their institution in each of these areas and to indicate for each, which of five statements (below) most accurately described the situation at their institution.

Senior management team (SMT)

1. SMT are not interested in mobile learning.
2. SMT are interested in mobile learning (e.g. exploring funding opportunities).
3. SMT are actively supporting and engaging with initial implementation of mobile learning (e.g. via a MoLeNET project).
4. SMT have a strategy for extending mobile learning to more departments in the future.
5. SMT have a strategy embedding mobile learning into delivery across the institution.

Teaching staff

1. No teaching staff are involved in mobile learning.
2. Some teaching staff are involved in mobile learning (e.g. via a MoLeNET project).
3. All teaching staff are being encouraged to think about how they could apply mobile learning and/or are being offered mobile learning CPD.
4. Some teaching staff are embedding mobile learning into their delivery.
5. Most teaching staff are embedding mobile learning into their delivery.

IT department

1. IT staff do not support the introduction of mobile learning (e.g. due to concerns that the introduction of mobile learning could compromise security).
2. IT staff are providing some support for the introduction of mobile learning (e.g. some support for a MoLeNET project).
3. IT staff are actively involved in selection of technologies and/or implementation of infrastructure to enable introduction of mobile learning (e.g. a MoLeNET project).
4. IT staff are an integral part of a mobile learning/MoLeNET project team and are committed to helping to ensure the success of the project.
5. The IT department has a strategy for supporting, extending and embedding the use of mobile learning across the institution.

Mobile learning in your institution

1. Mobile learning is not used in any departments.
2. Some small-scale implementation/piloting of mobile learning is taking place.
3. Several departments are using mobile learning.
4. Most departments are using mobile learning.
5. Mobile learning is embedded into the culture of the institution supported by CPD and strategies for sustainability.

16.1 Respondents

All 30 MoLeNET 2 lead colleges took part in the m-maturity surveys, completing at all three points. A few partner institutions also took part but their responses are not reported here as they represent a very small percentage of the partners.

16.2 Analysis

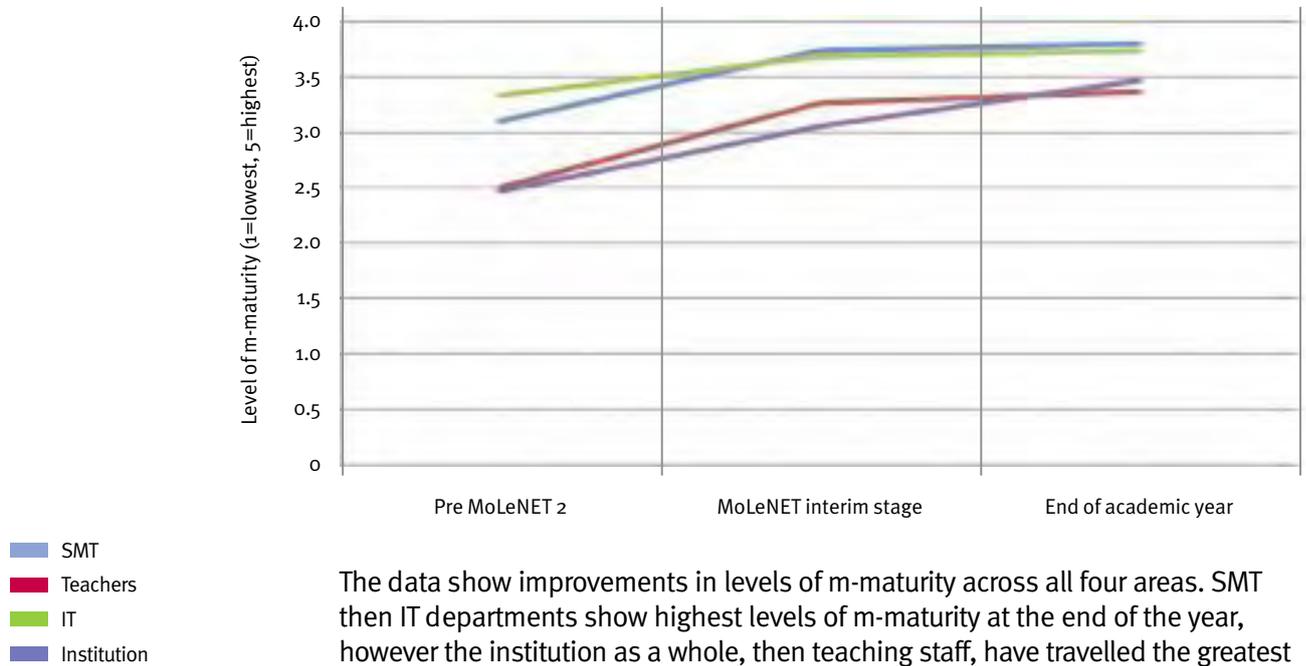
In addition to the basic analysis, comparisons have been made between phase 1 and 2 data and between colleges who were new to MoLeNET and those who were involved in phase 1.

16.3 Results from MoLeNET 2

Figure 35 illustrates the progression of the lead colleges, in terms of their level of m-maturity, from before the beginning of MoLeNET 2 to the end of the academic year in which it began.

Figure 35 Average m-maturity levels: lead colleges

Average m-maturity levels for all MoLeNET 2 lead colleges, plotted prior to MoLeNET 2, during MoLeNET 2 and at the end of the academic year 2008–2009

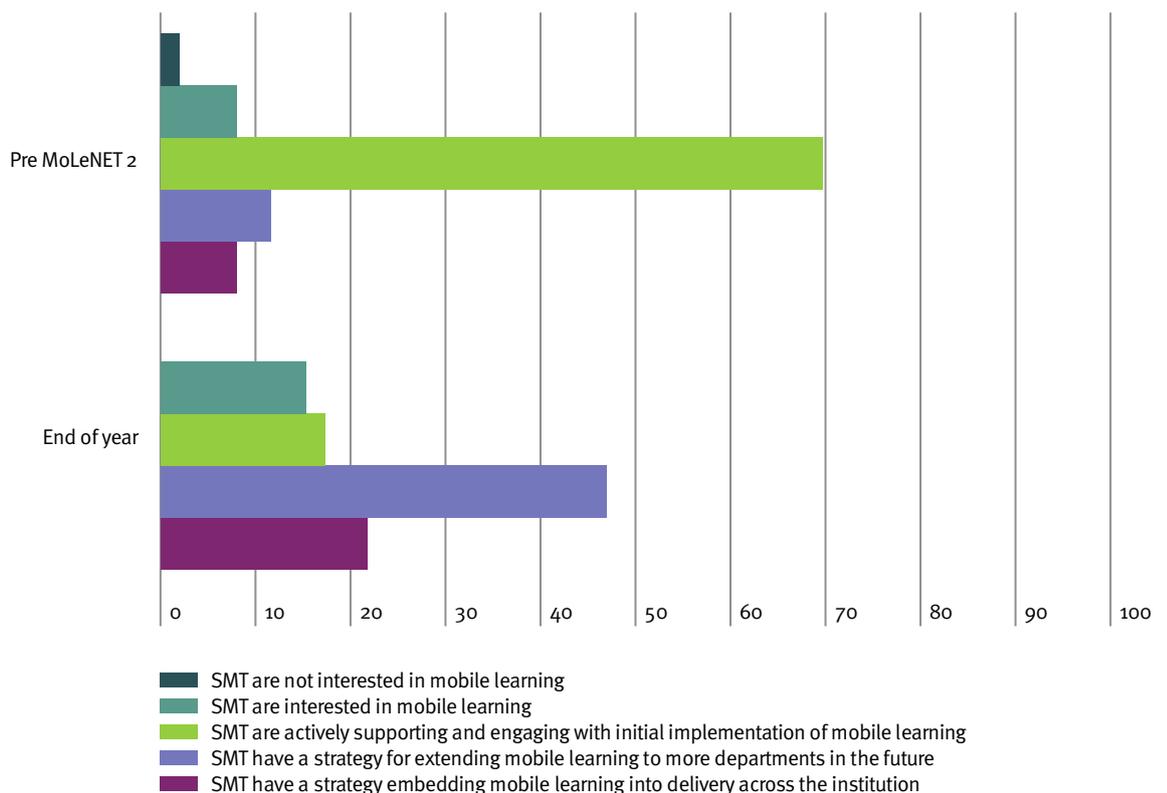


The data show improvements in levels of m-maturity across all four areas. SMT then IT departments show highest levels of m-maturity at the end of the year, however the institution as a whole, then teaching staff, have travelled the greatest distance along the m-maturity scale.

16.4 Detailed analysis

By looking at the categories represented by the five levels of m-maturity, illustrated in figures 36–39, we can identify where the colleges were and where they have progressed to, while taking part in MoLeNET 2.

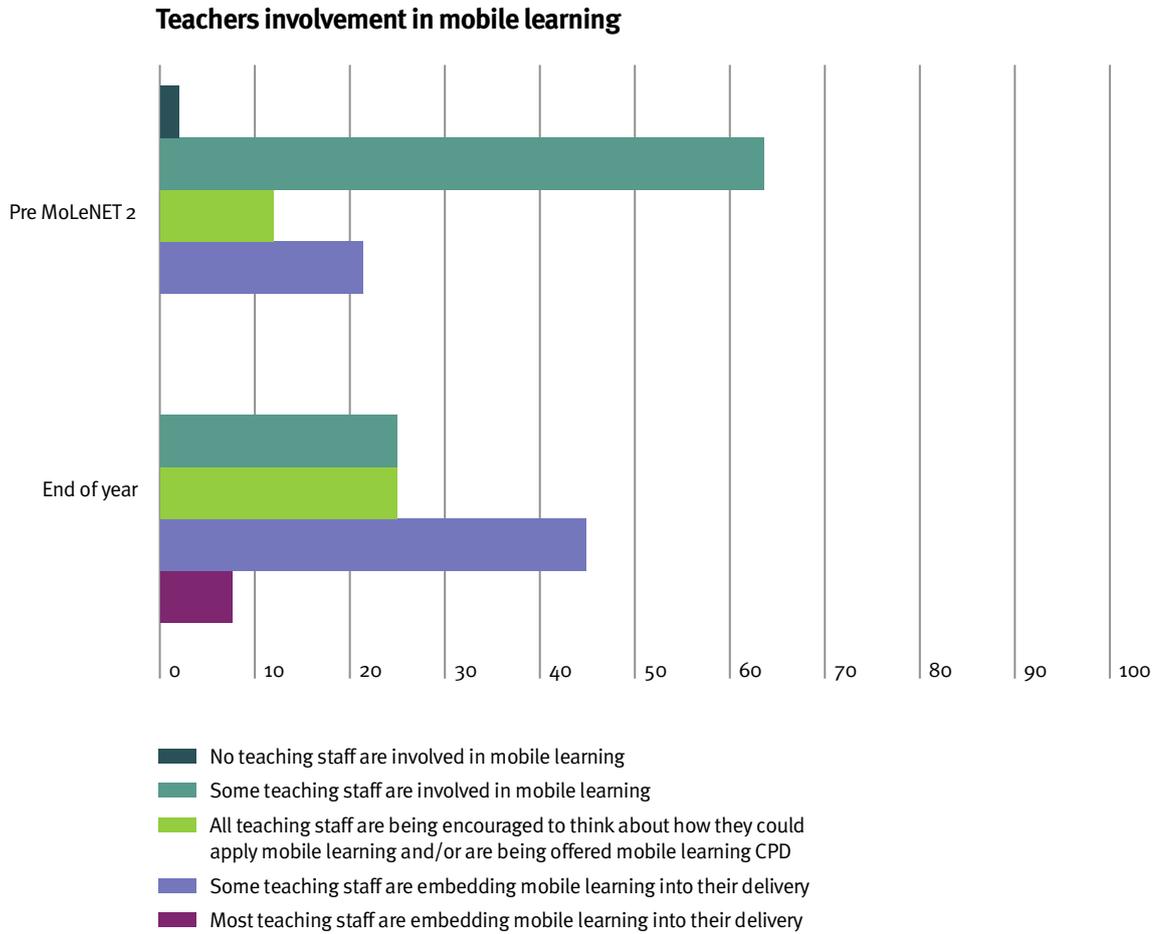
Figure 36 Average m-maturity levels: senior management
Senior management attitudes and involvement



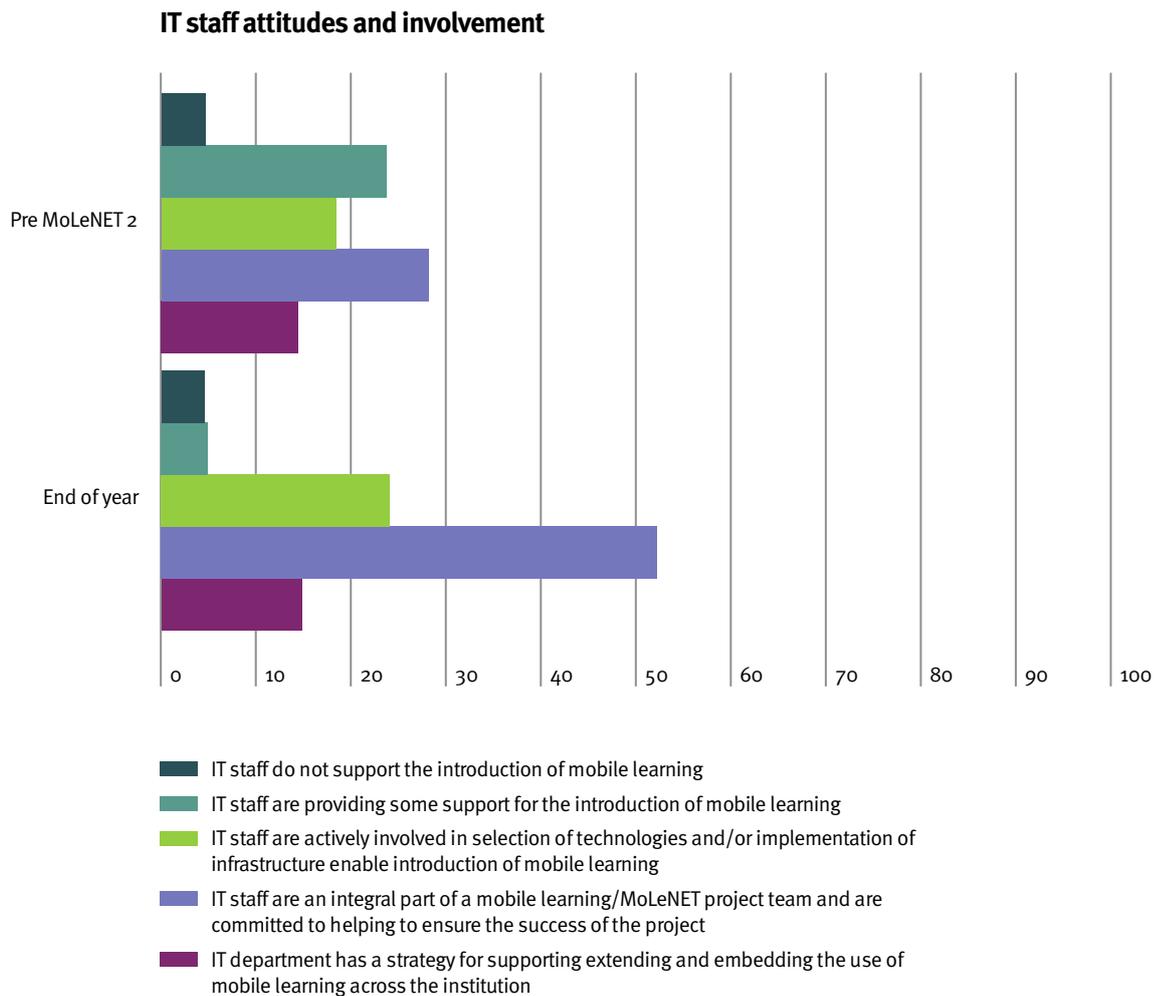
Before MoLeNET 2, most lead colleges reported that SMT were actively supporting and engaging with the initial implementation of mobile learning.

At the end of the academic year, however, almost half of colleges defined their SMT as having a strategy for extending mobile learning to more departments in the future, with nearly a quarter reporting that SMT had a strategy for embedding mobile learning into delivery across the institution.

Figure 37 Average m-maturity levels: teachers' involvement in mobile learning



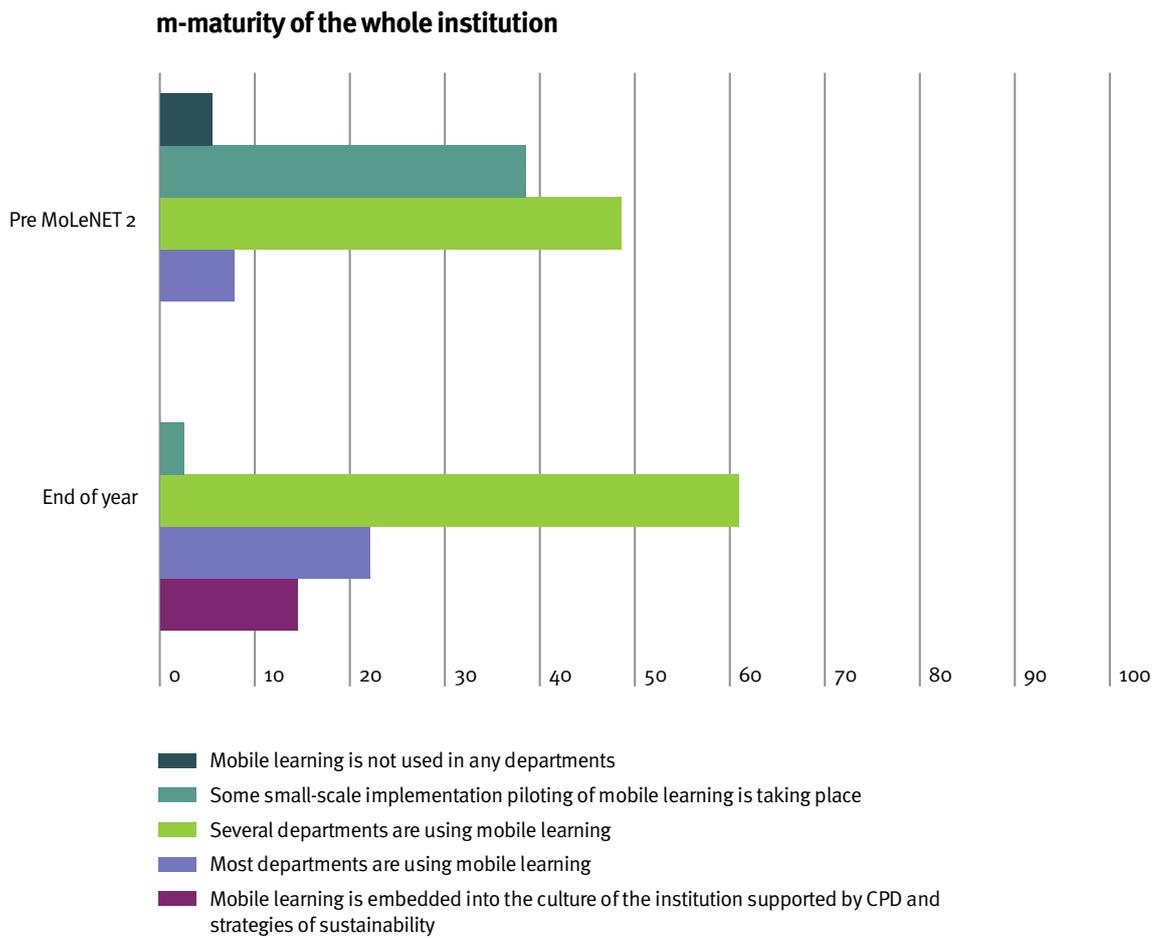
Prior to MoLeNET 2, most lead colleges reported that some teaching staff were involved with mobile learning. At the end of the academic year, however, almost half of colleges said that some of their teaching staff were actually embedding mobile learning into their delivery.

Figure 38 Average m-maturity levels: IT department

Prior to MoLeNET 2, a variety of responses were received from lead colleges, most indicating that IT staff were either providing some support, actively involved in technology selection and infrastructure implementation or an integral part of mobile learning and committed to its success. At the end of the year over 50% of lead colleges felt their IT staff were committed and an integral part of mobile learning.

Many projects identified the involvement and cooperation of the IT department as vital to the success of mobile learning projects.

Figure 39 Average m-maturity levels: the institution



Prior to MoLeNET 2, most lead colleges reported either that they were involved in some small-scale implementation or piloting of mobile learning or that several departments were using mobile learning. By the end of the academic year, almost all of the lead colleges indicated that several departments at least were using mobile learning, with some reporting that most departments were using mobile learning or that mobile learning was embedded into the culture of their institution.

17 Senior management views on the impact of MoLeNET 2

At the end of the 2008/09 academic year an independent consultancy, Force4 Enterprise Limited, was commissioned by LSN to carry out telephone interviews with senior management representatives of all colleges and schools involved in MoLeNET 2 projects. The aim of the survey was to ascertain the attitudes and opinions of senior management, preferably head teachers and principals, concerning the use of mobile technologies for teaching and learning in the light of their involvement in MoLeNET-funded projects. It also provided an ideal opportunity to collect further anecdotal evidence of the impact of mobile learning on results, success and retention rates.

LSN supplied 48 contacts and 41 interviews were successfully conducted. In practice it was only possible to carry out a small percentage of the interviews with head teachers or principals as they frequently delegated to another member of the senior management team. In some cases this person was also the MoLeNET project manager, which may have introduced some positive bias into the results of the interviews.

The methodology involved carrying out telephone interviews/discussions using five questions supplied by LSN, each requiring some detailed comment. Three of the questions also required answers that could be graded using fixed criteria. Although the standard template for structured questioning was useful it was often necessary to deviate from it to get good quality answers and to encourage interviewees to provide explanations and justification for their answers.

A summary of the findings of this research follows organised by the questions asked. The full report *Final report on interviews conducted with institutions involved in MoLeNet 2 Projects* (Force4 Enterprise 2009) can be found on the MoLeSHARE information and good practice sharing service at www.moleshare.org.uk.

Q1 What do you think about the use of mobile devices for teaching and learning?

100% of interviewees responded useful or very useful, with 75% stating that the technologies had been very useful.

Interviewees were asked to comment in support of their answers and the interviewer reported:

Although we did originally ask them to limit their answers to one or two sentences, this proved impossible. The enthusiasm and the positivity were so strong that they invariably got sidetracked into details on the devices, the courses they had been applied to and the impact on success rates and retention. It was therefore necessary to often link the questions and in some cases ask them to expand on certain aspects in order to get the quality and range of quotes required to meet the remit of this survey.

Some quotes from the response to this question follow, although for the reason stated by the interviewer, in some cases these are also relevant to some of the other questions.

*It has been **transformational**; the passion it has engendered in large numbers of staff and the impact on learning has been notable. It has moved the thinking forward in many ways. MoLeNET has given a real boost to all the agencies working together and the capacity of computer support and in terms of supporting different types of gadgets and understanding what the gadget is used for in a learning process has been the real move forward, not just seeing it as boxes on desks. (Accrington and Rossendale College)*

***Useful in the right context.** As long as a) the staff know how to use them fully and b) using them in the right context, not staff thinking that they have to use it to get a tick in the box, so where it makes sense to use them and it really enhances what they're actually teaching, then I think that it's a positive thing. (Bicton College)*

***Very useful in helping to move forward the ILT development within the college,** giving a new approach for some staff who thought they knew what ILT was all about, also very useful because it was, and still is, really great at engaging younger students particularly. Often they've got more skills in using these gadgets than the teachers, so that has helped the teaching and learning process where both sides are learning from each other. (Bridgwater College)*

*We found that the **young students were less impressed with mobile technology than the adults** and we thought it would be the other way round. **Adults certainly felt that they were being invested in** and enjoyed the technology. The younger ones were less excited. It may be that they are very accustomed to using their own devices and didn't have the sort of feeling of being invested in that we had with the older students. (Capel Manor College)*

*It has been **an outstanding success** with pupils in this field. It has increased enthusiasm and it has improved success rates. The handheld devices have been outstandingly useful and they've added a new dimension to teaching. (Fowey Community College)*

***It represents a significant advance, particularly for learners with traditional learning needs** and it enables them to develop and enhance their skills for employment and to improve their access to employment which is ultimately what we're about ...We've used the devices with learners with learning difficulties and disabilities, particularly learners at entry level and we've found that **they've increased motivation particularly because they are mainstream and regarded as 'cool'**. Our success rates are very high; they're in the top 10% so I would expect that they've contributed to maintaining them. (Hereward College)*

*It's been useful **for the enrichment of knowledge** of learners and it's also encouraging our learners to learn much more outside the classroom, away from the actual formal teaching. Learners have now got more thirst for knowledge than they had prior to having these devices. The pilot groups have continued a high success rate. In relation to the level of first entry learners, we had a drop-out rate before we got these devices, but **after using these devices we did not have dropout** but it's hard to analyse whether it was because of the devices. (Leeds College of Building)*

You need it to work out of the box. I think that it needs to be as simple to use as a Nintendo DS, a Flip or an i-Touch, something which students are used to. **If you give teachers, and to a lesser extent students, something that they have to learn to use, a lot of them might not get around to learning how to use it.** Whereas if they already know how it works and have already used it then they use it straightaway and continue to use it. The students are more experimental than the teachers. **(Ludlow College)**

We often have reluctant learners who have had difficult experiences in their former lives and we're always looking at innovative and creative ways to engage them and we found that **the use of mobile devices was really successful and was received very well by learners.** It particularly speaks to their creative skills and it's also been very stimulating for tutors to try different ways to address the needs. It's been particularly **helpful with differentiating**, providing differentiated learning within groups because obviously it allows individuals to do different things, so in general terms, yes very, very, useful. **(The Manchester College)**

We've had some absolutely brilliant results, with learners being more self-determining, more autonomous in the way in which they choose to learn and learning as and when they want to. But these are **only useful for certain groups of our learners with learning difficulties and disabilities**, the small screen size, the small function controls are not appropriate for learners with complex physical disabilities. **(National Star College)**

They were **useful in so many areas.** We've used them across the board in all kinds of different areas and haven't found one that they haven't worked well in. **(St Helens College)**

We found it very **motivational for students in non-traditional learning environments** where we want to get them to do quite a lot of practical work in the community and they need to put portfolios together and show the evidence. **(Stoke on Trent College)**

Q2 What impact has the MoLeNET project had on your college?

100% of the interviewees stated that the project had had a positive effect on their institutions, with 35% stating that it had been transformational 'in some areas'.

Respondents were particularly enthusiastic and positive regarding the impact it was having on student motivation, engagement and results, particularly where there had been problems in the past, and among disengaged learners or learners with learning difficulties. Many also stated that there had been a complete turnaround in attitudes to mobile learning in their organisations, which in turn was influencing future strategy and initiating a culture change.

The following are a selection of quotations from interviewees when asked to expand on their answers to this question.

*The research proves it. **There is some innovative work done, some fantastic empowering work.** There was one particular group of individuals on an entry level programme who had difficulties with learning; several probably had Aspergers, they were on the autistic spectrum, they hadn't come in with great success in their learning to that date but they managed, over the period of the first year with MoLeNET, working with different items, to get to the point where they were training staff. Now, two years later, some of those individuals are on advanced-level courses because they have been able to find a way of learning and found a kudos in what they were doing. **(Accrington and Rossendale College)***

It has engaged learners, it has motivated learners, particularly in the area where we focus on learners with learning difficulties and disabilities.

*Engagement with the senior management team has helped to push mobile learning forward and in some cases learner behaviour has improved with the intervention of mobile technology... It's had a really positive impact on teaching and learning but **to some staff it's still very, very new and in terms of staff training there is still quite a lot that we need to do.** (Aylesbury College)*

*We've had **feedback of high student satisfaction, it has had a positive effect on the teaching** and the students feel that the teaching is interesting. Other things have a higher priority but in a normal year our next steps would be to integrate further and expand and **it's really opened up the teachers' minds** in terms of what is out there and they are all definitely very keen to tackle the new technology and try and implement it. **We've taken huge leaps forward, especially with the MoLeNET project this last year in improving that.** (Bicton College)*

*For us the **biggest impact is almost collateral in terms of raising the profile of practical science into something which is truly exciting and accessible and supported** and what we have found is that the students of all ages, even ones who seemed a bit resistant to it, their **success rate has gone up really quite dramatically** and with science it's an area which is more difficult to crack so that focus is very important. It's also something which informs what we do with the 14–19 Diploma development with schools. (Capel Manor College)*

*It has **definitely had a positive impact.** We have a wonderful ambassador in the college working with a whole team of people and they've done incredibly well. **Teachers have reported improved quality of work; work completed quicker than before; improvements in collaboration and behaviour; increased motivation and learners finding aspects of the curriculum easier to access,** e.g. electronic readers support dyslexic learners, videos support review, recall and collection of evidence, gaming devices promote collaboration and competition and improved reaction times; they add a positive fun element to the serious business of learning which is a dimension enthusiastically received by students and teachers alike. (Chichester College)*

***It has had an impact on success.** It has had the biggest impact on retention, and success as a factor is obviously influenced by how many people you retain and how well they achieve. Our achievements were always pretty good, what's not been fantastic is retention and what mobile learning has done, is provided a more engaged learning environment where learners, **because they're so active in their learning, want to be involved and the motivation factor has gone up tenfold.** So it's had a bigger impact on success than it has on achievement. Many more people now want to stay in education and stay in vocational trades. (Exeter College)*

*It's been very positive and **it has been transformational for teaching and learning** and there have been tangible results that have been shown in the retention figures in the late part of the year for the areas concerned and the overall success rate due to using the technology. **The construction department which was part of the project, was re-inspected, it was on a Grade 4 in May 2008 and is now a Grade 2, so gone from adequate to good in part due to the technological advancements and mobile learning elements of the course.** It's been transformational for learners and staff and created a lot of excitement around the college of which we've been very proud and the results speak for themselves. (Hastings College)*

Management can see the benefits but it's the lecturers and students who can see the benefit more and can see what advantages it has given them. It's actually increased the demand to above what we can service at the moment. We don't have enough resources to satisfy demand now. **(Joseph Priestley College)**

It has the potential for highly transformational practice to be capitalised by these devices and we have seen that in a number of areas. It has enthused learners, helping them to study at times and places that are convenient for them. It's also **enabled completely new ways of interaction between them and their tutors that wouldn't be possible through conventional means.** **(Kingston College)**

By introducing them [handheld devices] into the curriculum **the students feel more valued** because they're getting something that they value, a tool that they can use and because it's handheld it's a tool that they can use anywhere, anytime and they've always got it in their pocket therefore they can get it out and use it whenever they need to. **It has increased motivation, it has increased results and we have concrete evidence to show that performance in AS level Art and AS photography has improved by a huge degree.** **(Launceston College)**

It's had a dramatic impact on our success rate particularly an AS programme of study that we do alongside National Diplomas. We were wary of mixing things together in the first year and it was a struggle getting the students to do that sort of slightly more academic work than they might have expected having joined a vocational National Diploma course, so to do the AS alongside was proving a real challenge and we only had a 50% success rate. Using the netbook devices and enabling research during sessions and in studios and during lecture theatres and having question and answer sessions etc, **raised the success rate by over 50% (based on 50% of the 50) so 75% success rate.** Whatever people seem to be talking about and things they wanted to know, what do they do? where do they do it?, they now have an instant response to the question rather than the idea of going to find out later, it's instantaneous, it's had a dramatic effect....

The success of our project ... is that it was very simple, in that we used to get students to go to libraries or go to the computer room in order to research a subject. Now they were able to access information anywhere in the college. We did also think that they would do things at home, or when travelling from one place to another but in practice they didn't, they didn't choose to work extra at home or other locations outside of college; what they did do was to use opportunities to do it on their breaks in the café and they did use them in the classroom so that was the real key in that **it maximised all the places they could work in college.** **(Leeds College of Art and Design)**

It's transformed learning. The most impact is on the retention of learning. **(Leeds College of Building)**

It has had a positive impact, particularly in engaging and motivating reluctant learners. We've had major utilisation of mobile devices with learners with learning difficulties and found that they have made huge progress, again largely because of being able to have personalised programmes and it allows them to work in an individual way. We have seen improved achievements, we're still looking to draw down and see precisely where, as it's only one part of what they use and **it's quite difficult to get the specific cause and effect but we do know that the success rate in the areas where we've used mobile devices has improved.** **(The Manchester College)**

It's been a revolution over the last three years of being involved in MoLeNET and using mobile technology. **We have learners now that, if it hadn't been for the development of mobile technology, would still be reliant on support...**

Learners with learning difficulties and disabilities learn to be more autonomous learners through the use of mobile technology; in a learning context, in work in the community and in their learning environment. **(National Star College)**

There are a lot of opportunities, especially to enable **us to motivate the lower level learners and to inspire them. It's made learning more fun and it's been more motivational**, they've often been doing things that they haven't perceived as being 'learning' yet they have been. It will enable more and more material to be made available anytime anyplace to learners. **(Northampton College)**

We've seen a big change, particularly from academic staff, those that have been involved in the project in the last two years so, **yes, very, very positive**. We feel it's had quite an impact on our learners now too... It has transformed some of the curriculum areas where we knew we had difficulties with our theoretical lessons and some of our theoretical delivery. So we wanted to try and address this through the project, using mobile technology to deliver in a different way, particularly with vision. **We have seen greater success rates but we can't be certain it was because of the mobile technology, although the learners themselves said that they felt through the surveys it had made a difference, that it helped them learn**, I think it's improved success rates but we only have anecdotal evidence at the moment. **(Oldham College)**

It's made some students who weren't normal leaders, become leaders, some kids quickly got to grips with the devices and what they could do with them and they spread that amongst the other students and these were students who we would not normally expect to be doing that. So **in terms of their learning and their self-esteem it was fantastic**. It's made **teachers reflect more about how we structure a lesson**, and because of the devices reflect on their teaching. We've had students helping teachers coming to terms with the technology. **The staff have been the sticking point rather than the students.** **(Roseland Community College)**

It has transformed teaching and learning in those areas where it's been embraced and utilised but we're not claiming it's transformed teaching and learning across the college yet but in the areas where it has been introduced and in areas where the staff embraced it then, yes, it has. **(The Sheffield College)**

It makes it fun for the pupils, it's a visual approach, and because they're born into a technological world, **it gives them access to learning quickly. It gives them an opportunity to share** through a device, if they've got special needs and they're struggling with communication and interaction then it scaffolds their learning. **(St Anthony's School)**

It's had a really positive effect on teaching and learning, from success rates four years ago of 57%, we'll hit 81% this year. Now that's been mainly due to a focus on teaching and learning and what the project has done has had a positive impact on teaching and learning and it has in some ways begun to transform some of the teaching and learning across the whole college. **(Cornwall College – St Austell)**

If there was enough money we would have gone for twice what we went for and then it would have had a massive impact. At the moment it is beginning to transform teaching and learning, it has certainly changed planning for this year and widened out to include full teams within the health and care area. We've devised a new learning area which will be totally different from a classroom, no desks for example, where students can do research and share ideas. (St Helens College)

It's had an effect on staff who have got a lot out of working with their students with different techniques and different resources and a whole host of other staff have had their appetite whetted. They're interested in the opportunities that mobile learning presents to them, they may not yet have been able to fully put that into effect, but I expect that that this will happen in the next year or two. (Stoke on Trent College)

It has transformed teaching and learning in some areas. It's opened up a world of new possibilities, in some areas it's fundamentally changed the way that teachers deliver their courses. That has been led by enthusiastic, confident teachers that were directly involved in the MoLeNET projects. It's had quite a variety of impact and depended hugely on the attitude of the staff towards the new technology. (Trafford College)

Q3 Do you think the use of mobile technologies will change teaching and learning in your organisation in the future?

100% of interviewees stated that they felt mobile technologies would change teaching and learning in their organisation and the majority added that it already had in many areas, which backs up the results of the previous question. The most relevant additional comments are listed below.

It already has and it will continue to do so. We did see the impact of mobile learning with some hard research, we saw the direct impact on individuals and when you see that translate to retention you can see the impact on some groups that might not have accessed the learning, or if they did, they've engaged far more. (Accrington and Rossendale College)

It's had a positive effect on the learning of the pupils, had a positive effect from the teachers' point of view as well. It's transformed teaching in some areas. It is the future – it is transforming teaching and learning and we should embrace it alongside traditional teaching. (Fowey Community College)

I'm convinced it will change teaching and learning, the fact that it will be accessible by all learners whatever their level of ability and that it will support their achievements and engagement with technology. I think the engagement with technology is obviously critical for the future. It's a very accessible way to the technology and very user-friendly so it presses all the buttons. (Hereward College)

It's changed learning but for the future it's having the funding to buy and maintain further devices although learners can use their own mobile phones. (Leeds College of Building)

It already has. *It's been a great device to make that change that we've been seeking for a long time, to move away from the teaching and more into learning, changing the dynamic. I think particularly where teachers have the confidence to properly use devices and allow devices to be used by learners then that's where it's had the greatest impact. We were already doing this in a small way but **we would never have done anything like this scale without MoLeNET and we wouldn't have been as innovative and we've taken more risks than we would have done.*** (The Manchester College)

The battle is to change people's perceptions of the devices, i.e. kids sitting at the back of the classroom playing games. It's changing the attitudes to trusting the kids and believing that most of them do want to learn. (Roseland Community College)

*We've got no doubt that the use of mobile technology has a positive impact on teaching and learners and have **no doubt it will be a key element in where we want to go with the college over the next five years.** I don't think that mobile learning technology will 'go away' and I think they're only likely to increase and develop and **we do see mobile learning technology as a good way of helping our development of blended learning.*** (Cornwall College – St Austell)

Practices are being changed through mobile technology and even if they don't do it strategically and centrally the **teachers on the ground are already changing the way they do things**, so it's being driven from the bottom. (The Sheffield College)

It's definitely part of the future, a part of blended learning. *There needs to be more built in but there's definitely a role for this kind of mobile learning and mobile technology. It's how the college can make it work. **We're using a range of mobile technologies and it suits different learners at different points on their journey through the education of life.*** (Tower Hamlets College)

It's a fantastic idea, we've got to keep up with the students and be able to talk to them in their language, not in text speak, but in their technological language. We need to be helping them to learn in ways that they will respond best to the learning. ***To some extent the students are taking the initiative with this technology and they are challenging us.*** (Tresham College)

Q4 What do you think needs to happen to make mobile learning sustainable in the future when further injections of external funding may not be available?

Answers to this question fell into three broad areas.

- how they could overcome problems with the sector's current funding shortage and the ability to fund further development of mobile learning from reduced funds.
- the ability to maintain what they already have in the light of the funding shortages.
- the ability to get continued support (previously available through MoLeNET), in particular for staff training and for information and technical support on mobile devices (particularly the smaller colleges and schools).

Overall, the results showed that senior management had seen the benefits of mobile learning and were therefore committed to funding it in some form, its maintenance at the least and its further development at best. To do this, funds would be diverted from other areas. Many stated that desktop PCs would be replaced with mobile devices and that they would, where necessary, improve the infrastructure to allow more students to use their own devices.

Many highlighted staff training as the key to sustainability, plus the ability to call on selected support when needed.

It was recognised that project funding would not be available indefinitely and the feeling was that the use of mobile devices would become so widespread and embedded in teaching and learning strategies that funding and training would become part of core funding.

The most relevant comments are listed below.

Staff training is key in terms of sustainability. We've introduced college wide technology days which started off at the end of MoLeNET 1... **Colleges have got to be a bit smarter and look at devices that students have themselves** because a lot of what we've done has been around the funding that we've been allocated via MoLeNET and if we can look at students' own devices, and how we can integrate them into the college systems, that would be beneficial. **We are also looking at parental, learner or employer contribution schemes** in terms of paying for new devices, because a concern in terms of sustainability is that technology is moving on so rapidly, some of the things that we bought from MoLeNET two years ago are now out-of-date. (Aylesbury College)

Events to see the technology in action would be really useful. We've managed to get so far and now it's going to get really hard in the next couple of years with funding cuts ...if there was funding available for any sort of support, even if it was not constant but drop-in support from someone to be able to do sessions with the staff. (Bicton College)

The most important is that **we believe the use of any technology to support learning has got to be embedded into our strategy as a college.** Our strategic plan really does drive what we do, so get it into the strategy and then it becomes a driver and then we **need to obviously make the staff aware of the advantages of using technology and be provided with the underpinning skills to create appropriate learning resources and use the technology effectively.** So it's turning strategy into operation and operation every day in the classroom and we're doing a lot to promote that because once you see the advantages it's plain to see and people really embrace it. **I think it's going to have a major affect on learning but colleges must recognise that and they must put it into their strategy so it becomes operational.** (Chichester College)

Changing strategy to make it sustainable is high on the agenda, making it affordable is going to be a challenge, we will seek ways to make it as affordable as possible but we're in a financial environment where we're looking at slimming down the organisation in terms of its establishment because money is so tight. **Part of our strategy is to continue to develop materials that are able to be deployed over any platform with a view to using students' own devices.** (Hastings College)

*We see MoLeNET as a vehicle for piloting approaches with equipment that we've been able to purchase with the funding, it's not a long-term sustainable model because we have to move towards where the equipment we're using is supplied in another method and **the most logical approach would be to exploit technology students have already bought into and own themselves and that is increasingly happening now.** (Kingston College)*

***What needs to happen in schools to make it sustainable is: the infrastructure needs to be in place, technical support; training for the teachers; cutting edge in internet-savvy teachers, who have used things like Flickr, and who keep up to date.** (Launceston College)*

*We're finding that we've got to address how we make our investments, we're re-thinking that. **Although the cost of the devices is not huge in respect of our annual capital expenditure on ITCH, it's the on-going cost of the technology, the revenue cost, BT connectivity, etc, those kinds of costs that are the issue so I think we're looking at maybe utilising more mobile devices within the same overall budget, cutting back on our capital expenditure to make room for revenue.** This will make the overall cost sustainable but of course in budget terms it comes out of different pots, it **means we've got to be much more attentive to the monitoring of these as well.** We've had some cases where **we've been using students' own devices, generally with adult students. Some students are happy and willing to do that but obviously we can't make assumptions about all the students being willing.** (The Manchester College)*

*Most of the work that MoLeNET does outside the funding, is **raising the awareness of what's possible in the sector so they very efficiently take the pockets of good practice generated by the project and disseminate it to the entire FE sector. That's where the money is so valuable, so necessary, not just buying the gadgets but about the support. What we received the money for in MoLeNET 2 we are now funding out of our own capital investment to take that work forward because we have seen the value of it and it's now about us investing ourselves** into what we've started with each of these projects. (Moulton College)*

***A big cultural change needs to happen, we've got to get away from the 'switch your mobile phone off when you come into this class' directive! Senior management do support this but we are unsure if strategy will change.** (Northampton College)*

***The great thing about the MoLeNET funding initially is that it takes the risk of research and development away.** One of the things that our project looked to address was learners using their own devices and also within the college funding the lower-cost devices. So where we've been able to, for **this year we've started to look at our own mini projects funded from our own budgets, now that the infrastructure is in place. We've proven that it's working in some curriculum areas,** so for others that weren't involved in the MoLeNET project, we've now funded them ourselves this academic year. (Oldham College)*

***I think it's now sustainable because the technology in the phones and devices that more and more students have got has raised the bar and they can do many more things now. We won't have to fund it, they've already got it in their pocket and we've got the infrastructure to deal with it.** (Redbridge College)*

*The 'Digital Britain' (report) talks about a digital divide where you've got more affluent people with access to digital technology complete with mobile devices and those less affluent that don't. **Providing colleges can address that issue, i.e. provide devices for their more socio-economically challenged students, then the benefits can be huge. Increasingly, students will have their own devices so that won't be the issue; the issue will be the connectivity within the colleges and the ability of the college system servers and equipment to talk to those devices so that you fully get all the benefits.** (The Sheffield College)*

The difficulty in using students' own devices is that they're loaded up with different programmes. Also, the other knock-on then is that you've got to have an ITCH support manager who's actually able to troubleshoot when everything goes wrong. Maybe in the future for mobile technology there could be mobile support in the form of a van going round schools and colleges to support them. (St Anthony's School)

Sustainability needs to be a corporate-wide approach. All departments need to contribute part of their budget and invest in these devices. I think it will happen in our case but it will be a couple of years before we see large amounts of money coming through. We also encourage the use of students' own devices, which does keep the cost down, but also means that some students are left out so we need to be able to plug those gaps. (St Helens College)

When we look at the overall budget there are potential savings in computing which will enable us to spend less on the infrastructure, the server networks and so on in the institution and maybe divert some of those resources, perhaps 20% of the resources into mobile learning for the future. The more we can use students' own devices the better, we will enable them to use their own as much as possible and that will allow us to do more with less cost. (Stoke on Trent College)

We've been moving to more independent learning, different ways of the learner engaging in their studies so it will change things for us. We're looking also at whether that's a better way rather than just storing up lots of computers in classrooms, if we're using more mobile devices they can have study sessions anywhere in the college if it's on the wireless network. (Tower Hamlets College)

We need to move to a model which doesn't depend on ongoing project funding; more staff development which becomes part of our normal ILT programme which is around mobile devices in the classroom or supporting learners using mobile devices. (Trafford College)

The key issue is the cost of connectivity ... would need to become a lot lower to make it transformational or sustainable. (Truro and Penwith College)

The cost of the devices isn't particularly the barrier, it's the implementation, like the staff development and support and co-ordinating that activity across the different staff service areas. (Wirral Metropolitan College)

Additional senior management comments

Interviewees were asked for any final comments or thoughts on mobile learning. This also gave an opportunity to pick up on areas of particular interest that had arisen from the other questions and gather some useful extra information that could perhaps be used to support and influence future project strategy. The most interesting comments were:

You can see that when it works, **when the teacher looks beyond the gadget and has to look at the pedagogy of how they're using it, it's a very powerful tool.** If you have an effective platform in terms of a VLE or in terms of a learning tool that someone is using, mobile devices are very empowering. **The challenge I would see is mainstreaming that practice,** that's the journey as opposed to having a number of passionate individuals, it's taking the whole organisational approach. **(Accrington and Rossendale College)**

Don't be afraid of it – students love it and staff will learn to love it. The biggest learning curve in terms of the whole project is the training and development of staff. **(Aylesbury College)**

Mobile teaching and learning, **if the staff are well supported and you take away the fear of using the technology and they understand where they can usefully and effectively use it, then it's going to be very effective** to those learners and it will produce good results. **(Bicton College)**

If learners are already confident using a technology then **we as teachers need to embrace it, if it can support teaching and learning delivery.** If learners regularly use Twitter, Facebook, blogs, etc, on their mobiles then they can chat/discuss/collaborate on their college work too. **(Bolton College)**

The basics of excellent teaching and learning are still in place, I don't think mobile technology revolutionises those, however, **the embracing of delivery of learning and the availability of learning using mobile devices is a small, significant revolution** in terms of what will be effective delivery of teaching and learning and success of students in the future. **(Bridgwater College)**

It's empowered staff and embraced innovative teaching and **it's enhanced the learning process by transforming learners from passive recipients to active constructors of knowledge.** **(Exeter College)**

There is no downside to it, it's been positive for the organisation and for the students. The funding and take up we've had in the organisation has been nothing but positive and it has increased the demand for it. **(Joseph Priestley College)**

Mobile technologies are rapidly becoming an indispensable tool for learning and teaching within the FE sector and they've introduced a whole new dimension to learning, making it much more flexible and significantly contributing to the personalisation of learning, which is a very positive step. **(Kingston College)**

They've **made a huge impact in improving the quality of learning and the outcomes** at the end. **(Launceston College)**

I think **we've had the most success with some of the hardest, most disaffected learners actually and it really does help to mend the barriers** that are there. **(Manchester College)**

What we've achieved so far has been very rewarding but **we have to make sure that the IT that we implement has sound pedagogic value...**It is a very worthwhile journey; we have moved forward a dramatic amount by taking part in the MoLeNET project. **(Moulton College)**

I think there will be a shift towards more mobile learning as learning moves from the classroom into a real and relevant learning environment. If the pedagogy is sound, technology budgets will reflect this. **(National Star College)**

We appreciate the motivation that can arise with learners through use of the devices and we are committed to pursuing further development of our use of them. (Newham College)

We will concentrate on our trainee teachers so that will have a cascading effect into the curriculum areas they will be working in. The academy status will allow us to do a lot more internal CPD aimed around mobile technologies, which hopefully will enable us to move into some transformational change. (Northampton College)

The research and evaluation that we have to do (a requirement for MoLeNET projects) has been invaluable to us, it's not something that we would do if it was just an internal project that we were looking at, it's been positive for the whole of the FE sector because you're picking up good practice from other people. It's also that you can be involved in an innovative project that is low risk because of the external funding. The positive aspect of external funding is the commitment to evaluation and researching a bit deeper. (Oldham College)

The kids were way ahead of us. They taught us what to do with the device, they came up with lots of solutions to our problems and it's started the conversation about mobile learning. (Roseland Community College)

Generally, provided organisations approach it in a pedagogically sound way and their research practice is sound, then the benefits can be many and varied... I believe that this sort of technology can allow students with difficulties or lower ability to transcend that difference. With other traditional disciplines they are impaired, but with this, the students with learning disabilities seem to be able to use and to benefit from this technology almost equally. (The Sheffield College)

It's had special benefits for us, as a special school, and that's why staff have run with it and put it into their curriculum. They've recognised that the technology actually gives them something that face-to-face teaching can't. (St Anthony's School)

The main outcome is the independence it gave learners – they did not have to ask how to do anything and were able to progress at their own speed, without drawing attention to themselves. (St Helens College)

Mobile learning technology takes us closer to the place where our students already are because they're mobile and they effectively are mobile learners anyway outside the specific college education environment – we're just joining that generation when we use mobile learning as a matter of course. (Stoke on Trent College)

It's been almost like having a new baby! The most wonderful exciting journey and at times the most tiring and frustrating. The afterglow is that we've created something that will continue to grow and to become more stable and more embedded within our normal culture of delivery. (Trafford College)

The issues are around staff development and supporting the delivery styles. It has been more successful where the staff have embraced it. It has enthused and excited both learners and staff generally, there has been a major enthusiasm to embrace this and the success of the implementation with the students has really quite excited all the people involved. We've had a number of staff involved who had little or no IT experience but were excellent teachers and those actually proved the better of the advocates to move this forward. (Wirral Metropolitan College)

Independent researcher conclusions

After carrying out the senior management interviews the Force4 Enterprise researcher concluded:

- It is evident from the findings that the opportunity to trial mobile learning ‘risk free’ has been extremely well received and successful.
- The project has opened the eyes of learners, staff and management to a whole new world of learning opportunities and it is now influencing learning strategies in organisations right across the education sector.
- Although some organisations did express concerns over their ability to fund future mobile learning development to the extent they would like, all stated that they would be continuing to fund it in some form.
- There was a lot of anecdotal evidence that the use of mobile devices had increased the success rates and in particular the retention rates in many areas. Reasons for this can be summarised (from the interviewees’ responses) as mobile has delivered or enabled:
 - improvement in student engagement with the learning process
 - better communication between teacher and learner, between peers and their learning networks
 - easier access to learning materials and more interactive learning materials
 - more appropriate learning methods
 - students who are more interested and enthused when using technology they are used to using for non-learning activities
 - learning seen as fun.

Senior management also suggested that mobile learning was particularly useful for disengaged learners and learners with special learning needs and learning or physical disabilities.

18 Advice and lessons learned

18.1 Project managers' advice and recommendations for introducing and embedding mobile teaching and learning

The following are specific pieces of advice given by project managers based on their experiences during MoLeNET 2.

Planning the project/implementation

- Be realistic in terms of the scope of your project/implementation.
- Plan the progress of the project/implementation carefully, identifying key milestones, sharing this with all those involved, and monitoring regularly.
- Recognise that change can take time and processes can take longer than anticipated. Don't be put off by challenges that present themselves along the way.
- Identify administration requirements and how they will be managed; for example, unpacking, tagging, storage, charging and maintenance of devices, and updating of college/school policies.
- Set up and disseminate communication tools such as blogs, wikis and Moodle forums, and ensure these are used regularly in addition to face-to-face meetings.
- Plan for feedback to be collected from staff and learners regularly, and for the findings to be shared with the relevant parties. This should inform the development of the project/implementation and changes that need to be made, issues that need to be addressed and successes that should be shared.
- Plan for long-term sustainability beyond the initial project/implementation.

Participants

- Involve colleagues from all sections of the organisation to ensure maximum support and sharing of skills and knowledge – departments such as marketing, student services and subject learning coaches have a lot to offer.
- Ensure all parties understand their role and level of commitment.
- Senior management commitment and enthusiasm from the start is key. Give managers devices and ensure they are used.
- Ensure ILT buy-in as their support and expertise will be essential.
- Designate dedicated and enthusiastic m-champions to keep the momentum going.
- Work with groups of enthusiastic teaching staff to ensure a positive start so that others who may be less convinced are able to see the benefits.
- Relying on a small number of individuals is a risky strategy as changes in staff and curriculum priorities may cause problems.

- Decide which learner groups to target/prioritise and base this on where mobile teaching and learning will support the achievement of specific aims and objectives for these groups and will have the greatest impact.
- Involve partners with additional expertise, such as other organisations with similar aims.

Training and CPD

- Gather initial feedback from those involved to establish training needs and to discuss concerns and expectations.
- Set up lots of formal and informal training opportunities and ensure all those involved have time to attend.
- Don't assume that learners do not require any training – this is not the case.
- Ensure that staff from across the college are trained so that there are 'local experts' for people to turn to for help.
- Ask suppliers to include training packages with purchases of devices.
- Utilise the expertise of MoLeNET and LSN.

Pedagogy

- Start with the pedagogy, not the device. Ensure the planned use of the technologies is appropriate and supportive for the specific learning context.
- One size does not fit all so allow staff and learners to experiment with different technologies.
- Ensure use of the technologies is embedded in curriculum plans. Consider how the functions of the technologies can be used to improve the learning experience and to overcome previous barriers to learning.
- Build in preparation time.
- Test devices before use in sessions to gain confidence and eradicate problems, including accessing various websites on a college/school network.
- Share good practice and learning materials developed.
- Listen to the learners as they will have ideas as to how to use the devices to support their learning.
- Consider ethical implications that may not previously have been an issue such as gaining consent from learners who are videoed/photographed and copyright implications on electronic resources.

The technology

- Trial a number of devices before making large purchases to check how they match up against requirements and their compatibility with existing infrastructure.
- Inform device choices through discussions with staff and learners.
- The functionality required should be the primary influence when deciding which technologies to purchase. This will depend greatly on the learning context – the subject area, learning locations, learner level, current issues identified, etc.
- Consider all aspects when making a decision, such as battery life, memory capacity, speed, compatibility with other devices and platforms, and managing data/call contracts.

- Don't rule out operating systems other than Windows.
- Build good relationships with suppliers and obtain assurances about procurement times.
- Consider the use of learners' own technology and what is required to support this.
- Redeploy equipment that is not being used effectively.

18.2 The importance of staff training and development

All MoLeNET 2 projects agreed that training for staff and, to a slightly lesser extent students, is absolutely crucial to achieve holistic change and sustainability. Some projects explained that many staff were not confident or competent users of mobile devices and that some lacked enthusiasm for mobile learning. Explanations for this lack of enthusiasm included:

- scepticism about the usefulness of mobile technologies for teaching and learning
- fear that they would not be able to use the equipment appropriately
- concerns about the time it would take to develop the skills and knowledge required to both use the technologies and ensure mobile learning activities were pedagogically sound.

Staff personal insecurities about using mobile technologies were observed including 'fear of looking unprofessional in front of students, and an apprehension of not being able to get the equipment to work'. (St Helens College)

It is important to note, as highlighted by a number of projects, the damage that lack of enthusiasm or belief on the part of practitioners can have and how this can affect the quality of mobile learning opportunities available to the learner. It is crucial, therefore, that adequate training and support, and opportunities for sharing mobile teaching and learning effective practice, are established.

Detailed advice from MoLeNET 2 projects concerning staff training and development can be found in the MoLeTech and MoLeShare services, which can be accessed via the MoLeNET website at www.molenet.org.uk

18.3 Technical, procurement and project management lessons learned

Any programme or initiative involving the use of new technology will inevitably encounter a variety of problems or issues. MoLeNET 2 project managers were asked to report on the challenges they faced and solutions they found. In analysing these reports some common themes were identified as: IT support, suppliers and procurement, relationships with others, deployment to staff and equipment.

Detailed advice related to these themes can be found in the MoLeTech and MoLeShare services, which can be accessed via the MoLeNET website at www.molenet.org.uk

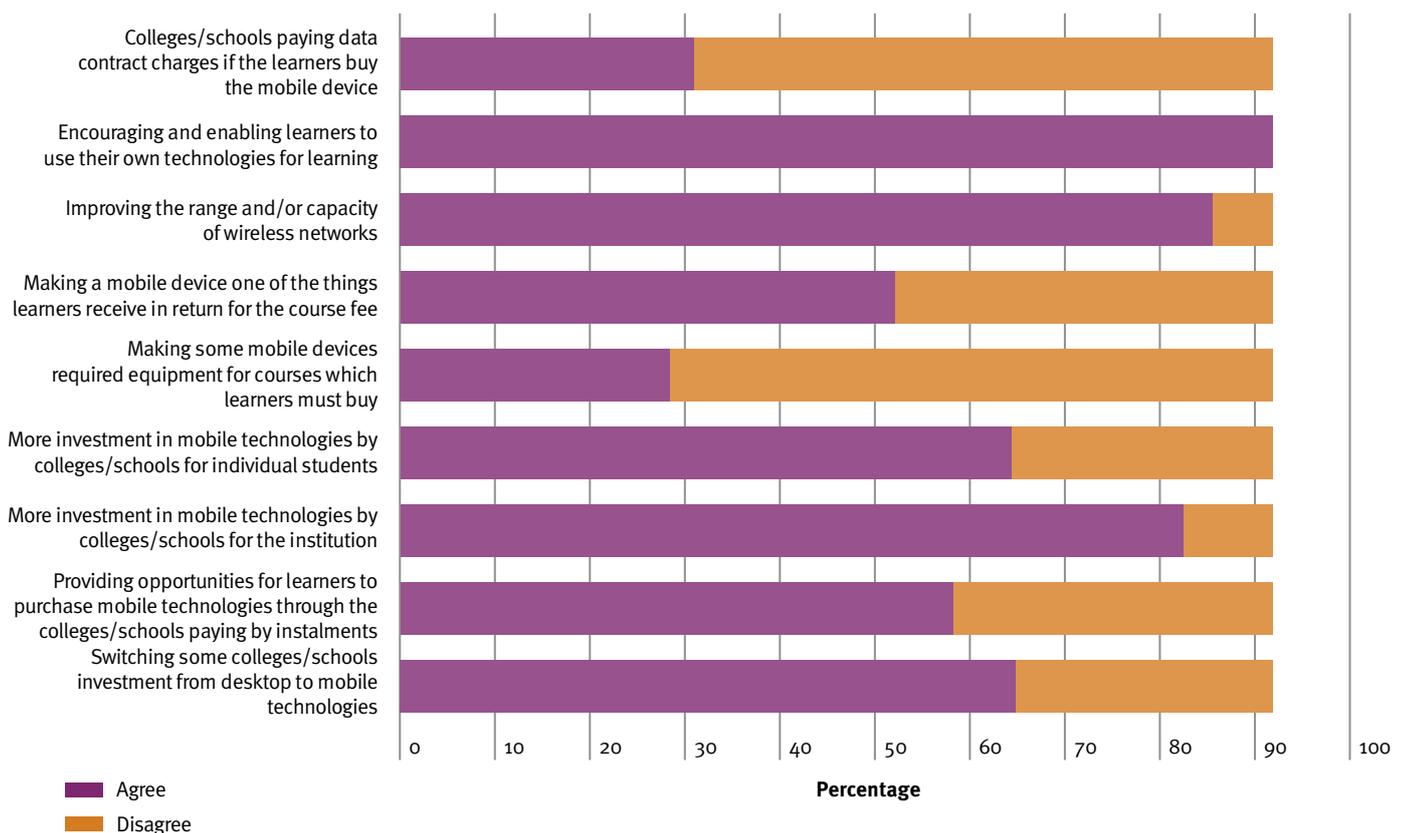


19 Sustainability

Projects were asked to consider a list of possible actions or strategies that could make mobile learning sustainable when external capital funding is no longer available and to indicate if they agreed that these could be effective. Figure 40 illustrates the percentage of projects that agreed or disagreed with each of the suggested strategies.

Figure 40 Sustainability strategies

Actions or strategies to support sustainability



All except one of the projects felt that encouraging and enabling learners to use their own technologies for learning could make mobile learning sustainable beyond external capital funding. Other popular strategies included improving the range and/or capacity of wireless networks (25 projects) and increasing investment in mobile technologies by colleges/schools for the institution as a whole (24 projects). The least favoured options were making some mobile devices required equipment for courses that learners must buy (8 projects) and colleges/schools paying data contract charges if the learners bought the mobile devices (9 projects).

19.2 More suggestions for sustainability

Other suggestions of actions and strategies that could support sustainability included:

- developing a range of strategies for different students/courses
- focusing on CPD opportunities available through open source applications and students' own devices
- exploring the feasibility of sponsorship to support new technologies and their development/implementation in the FE sector
- provision of wireless connectivity throughout the whole institution
- making connections with the local authority to discuss and share mobile learning initiatives
- embedding mobile learning into standard teaching documents, templates and guidelines
- updating intranets and VLEs to provide mobile learning information, advice and resources
- introducing mobile learning and the institution's strategy on this during staff and learner induction
- forums for teaching and IT staff to discuss aims, requirements and issues, and to promote collaboration
- a national strategy/guidelines for network management
- improved communication within the sector to share resources, content and good practice
- development or location of authoring tools that enable teaching staff to create their own content
- encouraging practitioners to produce multiplatform, differentiated resources that could be accessed by all and stored and added to via one central repository
- replacing expensive static equipment such as PCs with low-cost alternatives to free up funds for mobile technologies
- redefining e-learning and ILT strategies to promote and standardise mobile learning expectations
- developing open access networks and high-quality resources for use on learners' own devices
- developing a mobile device loaning system
- ensuring staff have enough time to experiment with different devices so that they develop the necessary skills and choose technologies that are task appropriate.

19.3 Barriers to sustaining mobile learning

Projects suggested that the following were the main barriers to sustaining mobile learning:

- the speed at which mobile technologies become out of date
- lack of funding to replenish stocks
- time and funds for training and support of teachers and learners with varying levels of skills

- time and cost of staff time required for planning, experimenting and creating resources
- shortage of high-quality, multi-platform resources
- convincing all staff of the benefits of mobile learning
- poor communication and level of understanding between curriculum and IT staff
- the need for technical support at all times not just during the day
- time and cost of managing, securing and maintaining a large number of devices if institutions provided the mobile technology for learners
- costs of data contracts
- the cost of ensuring adequate reach and capability of wireless networks
- relative scarcity of free wireless access outside the college
- concern about security issues if learners used their own devices
- equality issues associated with learners using their own devices as some had more advanced devices than others
- heterogeneous nature of mobile technologies and interoperability issues
- difficulties in ensuring cross-platform resource compatibility
- cultural shift, and leap of faith, required by institutions, staff, examining bodies and employers
- level of commitment required to ensure curriculum and ILT strategies were updated to ensure funds available for mobile learning.

19.4 Further observations from MoLeNET 2 projects regarding sustainability

Staff and learners

Some staff and learners are reluctant to embrace mobile learning if they perceive this to be at the cost of more traditional methods, particularly as examining bodies do not include mobile technology in the curriculum...this barrier is being addressed by staff becoming involved in industry steering groups, commenting on accreditation proposals. (Capel Manor College)

There are still staff who see mobile learning as a threat in the classroom. The solutions that will help to overcome this issue include: removing all barriers and hurdles by ensuring hardware and software are available to all; supporting and facilitating staff to higher than normal levels; producing exemplar materials and showcasing these; persevering with staff who are unwilling to engage (for example it may be they really want to incorporate a vodcast but don't want to hear or see themselves on camera, therefore pair them with a colleague and facilitate the production, then highlight the output to others); providing as much interesting and hands-on training as possible at accessible and useful times. (Moulton College consortium)

Relationships between tutors, learners and IT staff need to be further developed so that productive debates can be had over issues such as security, curriculum planning and delivery, resource development, establishing authenticity of work and fitness for purpose of IT infrastructure. (Stoke on Trent College)

The main barrier to sustaining mobile teaching and learning would be the amount of time involved in training and supporting staff and for teachers themselves to develop their delivery to include effective mobile learning. The variety of devices available only serves to amplify this issue, which also impacts upon technical and administrative support time...good working relationships are essential to overcoming this barrier. (Wirral Metropolitan College)

The dexterity required can be a barrier for some teachers and learners who find small mobile devices difficult to use. (Chichester College consortium)

Some learners are reluctant to use their own devices for college-related activities as they do not wish to merge their social and educational worlds. (Kingston College)

Technologies

It is useful to consider mobile devices in two functional categories, i.e. devices capable of advanced functionality and simple collection/playback devices such as cameras, voice recorders, media viewers and players. The more basic technologies have an established set of file formats, which can easily be converted for distribution to other similar devices. There are then the interactive and interconnecting functions such as voting systems, data sharing, assessment tools and Internet access. Even the distribution methods have become standardised through Bluetooth, WiFi or at the most basic level USB connection and common memory card formats.

Activities tend to be based around these technologies rather than on it. For example, learners may collect data to analyse in a study, or they may watch a video before completing a consolidation quiz. Adoption of this level of technology is low risk and can provide substantial benefits by adding variety and immediacy to almost any existing activity. With a little imagination and a pragmatic approach time investment in producing materials for such activities need not be prohibitive and the level of technology required to implement such ideas exists in virtually every learner's pocket so is inherently sustainable. (The Manchester College)

Institutions

Institutions find it very difficult to keep up with the pace at which technologies develop and because of the way organisations plan over a period of several years, they are often behind the times by the time the plan is implemented. They need to be more flexible in their approach to change so that they are ready to embed new technologies and pedagogies as and when they arrive. (Gloucestershire College)

Laptops are often viewed as the most versatile tool, particularly with reductions in prices over the years. Therefore purchasing a truly mobile device may not be seen as such good value for money unless institutions can be convinced that it serves a purpose that the laptop cannot. (Grimsby Institute of Further and Higher Education)

IT services and the ILT strategy group need to acknowledge and fully support mobile learning developments in a pro-active and responsive way in order to encourage and champion innovative learning. There needs to be a serious commitment with a definite timescale to provide easy access to site wide wireless network coverage. (Tower Hamlets College consortium)

Convincing the relevant college departments that mobile learning is indeed beneficial and cost effective and providing evidence of tangible benefits through the research is crucial ...mobile technology must be part of the IT strategy so that it becomes part of the renewable cycle policy. (Trafford College)

Appendix 1

Project summaries

The following are short descriptions of each of the 30 MoLeNET 2 projects.

Accrington and Rossendale College

Accrington and Rossendale College is a medium-sized general further education (GFE) college, located in east Lancashire. Its principal catchment area is the three boroughs of Hyndburn, Rossendale and the Ribble Valley. Most of the college's provision is taught at the main campus in Accrington, but it currently also has sites in each district and uses a number of other community locations. In March 2009 the college was awarded the Becta General FE award at the Becta Next Generation Learning Awards for innovative use of e-learning.

Hyndburn contains areas of significant deprivation. In 2007 the percentage of pupils gaining five A* to C GCSE passes at 48%, compared well with the national average of 46.8%. In Hyndburn 27% of adults had poor literacy skills and 29% had poor numeracy skills compared with a national average of 24% for both skill areas; in Rossendale the figures were 26% for both skill areas. The project explored the potential to raise retention and achievement, and what the college must do to embed mobile learning to make it sustainable.

Ashton Sixth Form College

The 'Learning in the Mobile World' project at Ashton Sixth Form College involved 32 staff and over 180 students with allocated mobile devices. The whole student population benefited from the installation of the WiFi network across the entire college campus (more than 2000 16–19 year-old students). The College's commitment to CPD meant all staff had access to the full range of devices as part of the eLearning day in June 2009.

Unemployment in Tameside is lower than the national average and the proportion of residents from minority ethnic groups is below the national average at 5.4%. Tameside residents have some of the lowest rates of pay in the Greater Manchester sub-region and over a third have no academic qualifications. The project further developed and embedded the use of mobile devices across a wide range of curriculum subjects, from Levels 1 to 3, and included the use of iPod nanos, iPod Touches, iPhones, Nintendo DS, XDA Mantles, ASUS eePCs, Flip cameras, digital voice recorders and Palm Treo Pro PDAs. On the whole, teachers identified improved student engagement and attendance, with particularly pleasing increases in self-esteem and motivation in the Level 1 and Additional Learning Support learners.

Aylesbury College consortium

Mobile Works! led by Aylesbury College in partnership with National Star College, David Lewis College and Hereward College involved 181 learners and 52 staff. It aimed to support preparation for work and employment, focusing on accessibility for learners with learning difficulties and/or disabilities. Learner motivation, staff attitudes and employer engagement were all planned to play key roles in supporting the applications and devices used throughout the project.

The lead college was based in Aylesbury Vale, a semi-rural area in the county of Buckinghamshire. The population increased by 13% during 1999/2001, making it the fourth fastest growing district in the South East region. Minority ethnic groups form about 6% of the population. Although most of Buckinghamshire is affluent, small areas of deprivation do exist, with three areas in Aylesbury falling within the most deprived areas of England.

The consortium partners are a combination of one general FE college and two specialist colleges. Hereward College, based in Coventry, provides comprehensive specialist facilities for supporting day and residential students with a broad spectrum of learning needs that may be complex, due to disability or learning difficulty. The National Star College is an independent, specialist college providing for learners who have physical disabilities and/or acquired brain injuries alongside associated learning, behavioural, sensory and medical difficulties.

The project introduced mobile technologies including smartphones, Nintendo DS with Dr Kawashima's Brain Training and Professor Kageyama's Maths Training, Samsung Q1s, Blackberries, Archos 5 to support learners with learning disabilities and/or difficulties. The David Lewis Centre is the largest UK provider of a range of medical, educational, residential and assessment services for people with complex epilepsy and other neurological conditions, including learning disability and challenging behaviour. All consortium partners reported improvements in learner motivation and confidence.

Bolton Community College consortium

The i-PAL project led by Bolton Community College in partnership with The Oldham College, aimed to:

- create a sustainable mobile learning culture to enhance participation, collaboration and success
- use mobile technologies to engage, excite and enable the learners and ultimately seek to enhance their retention and achievement.
- build learner confidence by making learning accessible and available to them at any time and place they require it.
- support tutors to use technology in a formal teaching and learning environment and outside the classroom.

The i-PAL project involved 650 learners and 240 staff across both organisations. Technologies used were Nintendo DS Lites and Dr Kawashima's Brain Training games, mobile phones, iPod Touch, memory cards, video cameras, headcams and a 3D motion capture suite. The DS Lites were used with Dr Kawashima's Brain Training games to support literacy and numeracy skills, while the video cameras, headcams and 3D motion capture suite were used to create accessible mobile learning resources.

At Bolton Community College learners were provided with memory cards and card readers so they could access the learning resources on their own mobile devices, while both colleges also provided learning via iPod touches. Bolton Community College serves 11 neighbourhood renewal areas and along with The Oldham College is in one of the most deprived areas in England, with one of the lowest levels of educational achievement. More than half of all learners at The Oldham College came from areas categorised as disadvantaged and the town was at the centre of riots in 2001.

Bridgwater College

The Bridgwater College project ‘Using MoleTec to better respond to employers and engage with learners’ identified some 150 learners and a core of 15 staff to be involved in a range of sub-projects that explored learning delivery in the traditional college-based settings and the flexibility required in working with employers.

Bridgwater provides education and training to the immediate town and surrounding area, with learners choosing to travel significant distances to access provision. The employer-responsive developments mean staff travel across the south west working with employees and employers to meet their training needs.

The project supported the use and application of Nintendo DS with Dr Kawashima’s Brain Training games, PSP with camera attachments, iPhones and other mobile devices to enhance independent learning strategies, stimulate engagement in learning and focus on ‘difficult to deliver’ curriculum. Already high retention and achievement were increased or maintained, with learners and staff expressing positive experiences and an increase in higher grades.

Capel Manor College

Capel Manor College is the leading provider of land-based studies in London with centres in the north, south, east and west of the capital. This project centred on learners at the college’s north London centre in Enfield, and further focused in on students in the School of Arboriculture and Countryside. During the project 155 students (86 full time, 69 part time) used the newly acquired mobile technology: some students had a few sessions with specific pieces of equipment, others had more exposure to a wider array of the equipment. Of the students, 68 were studying Level 3 courses and 87 were studying Level 2 courses; 60 were 16–18 and 95 were 19+, with most of the 16–18 students studying full time (45 FT 16–18, 15 PT 16–18). The devices used were all pieces of mobile technical surveying equipment, and included weather stations, PDAs, GPS, etc. The project was conceived to update surveying techniques from traditional pen-and-paper-based recording towards more cutting-edge and industry-relevant hi-tech techniques.

Chichester College consortium

The ‘Keys for Opening Doors’ project, was led by Chichester College in partnership with four secondary schools: Bourne, Bognor Regis and Manhood community colleges and St Anthony’s (a specialist secondary school). Chichester College is a large general FE college with a second, land-based campus, situated in Brinsbury, near Pulborough. The College is regarded as the ‘first-choice’ college for many school leavers from these schools who go on to become students at both locations. The area itself is generally affluent, but a few areas served by the college are considerably less prosperous, particularly along the coast to the east of the city.

The project involved 60 staff and 300 learners with moderate to complex learning and/or physical difficulties including autism, dyslexia, visual impairment and other mobility disabilities. They were introduced to a diverse range of mobile technologies from Nintendo DSs to support numeracy to FlipCams, smartphones and electronic readers to aid communication. Teachers reported improved motivation, learner behaviour and achievement exceeding all expectations. It was a great opportunity to collaborate and learn from each other's experiences. Links and relationships were strengthened and the Chichester area now has a pool of expertise that can benefit all providers in the region.

Cornwall College consortium

The 'Embedding MoLeNET Across Cornwall' project was led by Cornwall College in partnership with Fowey Community College and The Roseland Community College. Cornwall is a largely rural area and Cornwall College is a very disparate college with campuses all over the county from Saltash to Redruth.

This MoLeNET project built on lessons learnt in the previous year's project and largely focused on the use of video, although the partners also looked at several other areas including audio, geographical technologies and the use of media players. The main areas of curriculum focus were teacher training, WBL, 14–19, and low-level learners. Teachers reported a significant improvement in performance and achievement as a result of the use of the devices and found it generally easy to incorporate mobile learning into their curriculum.

Ealing, Hammersmith and West London College

EHWLC is one of the largest general FE colleges in the country. West London has the highest proportion of residents from ethnic backgrounds other than 'white British' in England. The sub-region supports one of the largest refugee and asylum-seeker populations in the country. The College has a 20,000 strong student body, which represents over 100 nationalities and 70 different languages: 71% of students are from disadvantaged backgrounds.

The project was aimed at level 1 learners studying on the BTEC Introductory Diploma courses. There were 256 learners and 21 members of staff – teaching staff and technical support staff – involved. The project focused on introducing m-learning devices to improve literacy and numeracy skills. These ranged from gaming devices and MP3 players for numeracy to netbooks and e-books to improve literacy skills; however the action research part of the project concentrated on two devices Nintendo and MP4 players. Project one looked at a device that could help the learner with their multiplication tables and project two at a device that could support the learner's underpinning knowledge for their core course units.

Learners, teachers and managers all embraced the challenges of the project and the outcomes were positive. Teachers were able to reflect on their CPD development and learners were motivated by the knowledge that they had been selected to participate in this prestigious project and entrusted with 'cutting edge' devices.

Exeter College consortium

The Flip IT Project led by Exeter College in partnership with Bicton College involved 360 learners and 46 staff (Exeter: 325 students/38 staff and Bicton: 35 students/8 staff). Exeter College is a large tertiary college with sites in the city centre and in satellite sector-specific locations, e.g. the construction site is based on a large industrial estate. At the end of 2007/08 854 Apprentices were undertaking qualifications while working with 526 employers; 69% of the Apprentices were aged 16–19. Of the 13,000 learners enrolled at the college in 2007/08: 29% were 16–19 year olds taking full-time qualifications; 4% were 16–19 year old Apprentices and 46% were 19+ learners taking part-time qualifications (including Train to Gain and Apprenticeships).

The project supported wireless access across all college sites and introduced the use of mobile devices such as UMPCs, Flip cameras, digi-recorders and iPods, initially, to the prioritised skilled sectors of health and social, childcare, hospitality and, for Bicton College, land-based engineering. It helped to create mobile, collaborative, personalised learning opportunities for students with limited access to the main college environment and enabled flexible access to widen the participation of learners in rural communities or non-technology based vocational areas

Gloucestershire College

The Shiny project focused on the use of mobile devices for the assessment of learning at Gloucestershire College. It developed and implemented the use of m-assessment across the curriculum using a variety of mobile devices including the PSP, Nintendo DSi, Promethean Activexpression learner response system, UMPCs, MP3 recorders and MP4 video cameras.

The Shiny project built on the work of the MoLeNET Glossy project, which provided the infrastructure for mobile learning, through mobile devices encouraging use of m-assessment. It started a cultural shift in the assessment models used by practitioners and provided opportunities to learners and practitioners for a more engaging, relevant and personalised assessment experience. It is helping to build a sustainable future for m-assessment at the college through case studies, guides and exemplars.

Grimsby Institute of Further and Higher Education

The ‘Connect to Succeed’ project run by the Grimsby Institute of Further and Higher Education utilised mobile technology to improve retention and achievement within identified curriculums, through improved access to learning resources across the campus, via handheld devices and new accessibility via WiFi on their fleet of buses. It allowed them to purchase mobile internet tablets for 250 learners, WiFi routers for 10 of the mobile fleet and build m-learning to enable students to access course information on the college’s VLE, Moodle, the internet and in user group portals created for their courses.

The project focused heavily on improving retention and achievement and feedback so far suggests they were successful in this.

Hastings College

The WILMA (work-based individualised learning through MP4 applications) project at Hastings College involved 160 learners and 20 members of staff. The college is on the south coast in an area of regeneration, with some students from deprived backgrounds who lack access to computers.

The project was designed to investigate the use of MP4 (iPod) mobile technology supported by social networking in teaching within the work-based areas of hair and beauty, construction and A/AS-level learners. Teachers reported improvements in enthusiasm for learning, increased learner confidence, and the positive impact of flexible learning methods.

Joseph Priestley College consortium

The mBuild Project was led by Joseph Priestley College (South Leeds) in partnership with Leeds College of Building. It involved 404 learners and 51 staff. Leeds has 53 Super Output Areas all of which are ranked in the most deprived 10% nationally on the 2007 Index of Multiple Deprivation. Joseph Priestley College had been involved in MoLeNET 1 as part of the m4m consortium, where the emphasis was on evidence collection and wireless networking.

For this project, the aim was to work with another college, share good practice from the beginning and look at expanding the use of m-learning through data contracts. This would enable learners such as sport students to use the devices to collect evidence while kayaking or climbing. Another focus was learners with learning difficulties and disabilities, who collected video evidence on work placements and used DS Lites to follow and create menus for their café. At Leeds College of Building devices such as netbooks were used to allow learners on construction sites access to learning materials through a bespoke entry page.

Kingston College

The KAPTIVATE project addressed two areas:

- student peer teaching: this involved learner-generated podcasts for use in explaining and demonstrating concepts and skills to their peers. Student-created content was especially important in ESOL, teacher education and fashion
- assessment: from the outset the project set out to explore how podcasts could be used in assessment for learning; students were especially successful in creating podcasts as part of assessed activity in media technology and fashion.

The project involved 565 learners in 15 subject areas. It involved the introduction of iPod Touch devices and associated mobile recording equipment to support the processes of creating, accessing and learning from podcast resources.

Leeds College of Art and Design

The MoleNET research project by Leeds College of Art and Design (LCAD) involved 183 learners and 22 members of staff. The following description of the socio-demographic context and catchment area is based on a report created by Richard Spenser (2008) for the National Arts Learning Network.

Leeds Metropolitan District is the second largest authority in England. According to the 2001 Census, 92% of Leeds residents are white. Residents of Indian, Pakistani and black Caribbean origin form the largest minority ethnic groups. Leeds is the largest employment centre in West Yorkshire, with about 387,000 people in employment. The majority are employed in the service sector (316,000), manufacturing (51,000), and construction (19,000). The 11–19 population in Leeds is 65,000, with 41,000 in the 14–19 age range. Over the coming decade there will be a significant 12% decline in the size of the 16-year-old cohort, from 8,400 in 2006 to 7,250 by 2013. Leeds is a district of cultural and ethnic diversity with inner-city areas that have high levels of deprivation. LCAD caters for a wide-range of abilities and backgrounds.

The project introduced UMPCs, intended to improve the e-accessibility of learning to support their studies. Staff reported improvements in learners' enthusiasm for learning and the data showed an improvement in achievement and success. The project provided UMPCs to first-year students studying National Diploma and AS qualifications to support the integration of theory and practice while supporting all learners, including those who are at risk of failing.

Ludlow College

The m-Ludlow project aimed to make Ludlow College a WiFi e-learning centre to increase access, flexibility and personalisation of learning for all students, especially work-based learners. It started with the installation of new wireless infrastructure and the distribution of three different technologies to five student groups, employers and staff, to identify the most appropriate and engaging tools. Project objectives included allowing students to learn at their choice of location, when they chose; enhancing student learning opportunities, experiences and skills and making learning fun; and enabling a wider range of evidencing opportunities via 'e-portfolios' for NVQs, such as videos, voice recordings and images.

The Manchester College

The MoLeNET 2 project carried out at The Manchester College involved four main cohorts, with an immediate effect on over 100 learners and 12 staff, with the potential for a possible 400 learners and 40 staff to become involved as the project progressed. Based on sites across urban Manchester, the project targeted learners with learning difficulties or requiring additional learning support or whose first language was not English; media, IT and Diploma students and ex-NEETs. A wide range of equipment was used including headcams, DS-Lites, PSPs, MP4 players, netbooks, iPAQs, iPod Touches to deliver personal resources, provide self-evaluation tools and enable interconnected activities.

Learner engagement, interaction and cooperation were notably enhanced in all cohorts with consequent behavioural and achievement improvements.

Moulton College consortium

The 'Open Access Key Skills' project, led by Moulton College partnered with Northampton College and Tresham Institute, involved 450 learners, 41 staff and procured over 500 mobile devices. The project initially focused on raising achievement levels in Key Skills and later broadened to encompass wider curricula that used the embedded Key Skills model. The project evaluated a wide range of devices including, PSPs, DS Lites, smartphones, iPaqs, UMPCs and iPod Touches utilising internet access on either GSM or bespoke WiFi networks, two of which were installed as part of the project.

Case studies and focus groups with lecturers to gather qualitative feedback have suggested that learner engagement, motivation and class performance rose where devices were introduced. The case studies also provided robust feedback on some of the limiting factors of particular devices.

Redbridge College

Redbridge College ‘PEP Talk – Personalisation, E-Portfolios and Podcasts’ project involved 68 learners and 12 teaching staff from music, media and hairdressing, and included an ESOL hair group. These areas were chosen because their retention and success had been a cause for concern in previous years. Every learner was provided with a Gigabyte U60 UMPC with which they could take pictures and videos and edit their online personal learning plans using the greatly enhanced wireless network. The learners were very enthusiastic about the mobile devices and were able to extend their learning beyond the classroom as well as access resources from non-IT areas of the college.

Reigate College

The ‘Using podcasting and vodcasting to personalise learning and revision for students’ project, led by Reigate College, involved 374 learners and 18 staff. Reigate College is a sixth form college located in south east Surrey, an area characterised by relative affluence and low unemployment, although there are pockets of relative deprivation within the college’s wide catchment area. The project utilised mobile technologies including Archos 605s, Sony PSPs and netbooks to enable learners to access podcasts and vodcasts based around revision on a 24/7 basis. Both the staff and the students reported an improvement in the level of engagement in revision and the number of different resources utilised to prepare for examinations.

The Sheffield College

Sheffield is England’s third largest metropolitan authority with a population of just over 530,000. The jobs density in the city is slightly higher than nationally (0.89 compared to 0.88). Literacy and numeracy levels are comparable with other urban areas. The MATTS (M-Learning, A Tool for Transformation in Sheffield) project involved almost 700 learners and almost 150 staff. It took place primarily with learners based at Sheffield City College, the city centre campus. It had two main strands:

- vocational: aimed to deliver increased efficiencies in vocational and workplace assessments using m-learning to record evidence and subsequently store in e-portfolios for tutors/assessors to validate online
- learner voice: learners submitted short ‘bids’ saying what mobile technology they wanted to use as part of their learning.

Lecturers reported a positive impact on learners’ attendance, behaviour and enthusiasm for learning and predicted an increase on achievement. The MoLeNET legacy will engage, value, challenge and support both staff and students over a considerable period.

St Helens College

The SMiLe@SHC (Supporting mobile learning at St Helens College) involved over 200 learners and 25 staff. St Helens College is a general FE college serving the borough of St Helens, which lies to the south east of Merseyside and has a population of 176,700. Although some areas of the borough are comparatively affluent, others have high levels of social and economic deprivation. The college has three campuses: one in the town centre; a technology centre about two miles away and another five miles away in the town of Newton-le-Willows. The College employs over 800 staff and has over 15,000 learners. St Helens College has a long history of innovation, investment and effective deployment of new and emerging technologies for the benefit of its staff and learners.

This project helped to introduce a new dimension to teaching and learning by implementing a range of mobile technologies into various curriculum areas (sports, teacher training, horticulture, floristry, animal care, engineering, cleaning services and Key Skills). Devices used included: iPhones, PDAs, PSPs, Notebooks, zPens, digital cameras, audio recorders, headcams, mini-projectors and video. Staff reported increased motivation, improvement in learner behaviour, retention, achievement and success.

Stoke on Trent College

The mStoke project enabled the mainstreaming of m-learning pilots developed across the college by the college in response to its ILT strategy, with the result that staff college-wide benefited from the expertise and experience developed through these pilot programmes. Activity being mainstreamed included the use of mobile devices and e-portfolios in the workplace, mobile gaming devices to engage with young people, streaming multimedia, re-purposing and deployment of multimedia learning objectives in a variety of formats via PDAs, gaming devices and mobile phones to provide a rich personalised learning environment to a wide range of learners.

The project focused on a wide range of areas including engagement of NEETs, enhancing and improving access to technology-based learning and improving the take-up and retention of learners in the area. Timely completion of qualifications by work-based learners was the other main strand. The project developed greater knowledge on the training and skill needs that must be addressed in formal CPD and informal support of activities in this area.

Tower Hamlets consortium

Tower Hamlets and Newham colleges serve areas of acute deprivation. Their self-assessment processes, feedback from HMI visits, and new national priority targets for Skills for Life point to an urgent need to improve literacy at entry 3 and level 1 across all age ranges. They expected to establish mobile learning via handheld devices as an effective and sustainable solution to this issue with future device costs covered by demonstrable improvement in retention and achievement. The project also evidenced the need for a strategic entitlement to mobile learning for these learners to further facilitate differentiated and independent learning.

Led by Tower Hamlets College in partnership with Newham College the main aim of the project was to achieve significant and measurable improvements in entry level 3 and level 1 Literacy through the deployment of handheld smartphones and to establish a culture of entitlement to differentiated, independent and collaborative learning outside the classroom.

Trafford College

This project aimed to consolidate the existing use of mobile technology at Trafford College, and expand provision of excellence into three new areas: Skills for Life delivery, Train to Gain initiatives, and teacher training provision. Building on areas of good practice developed in MoLeNET 1, it investigated methods of engaging learners on Skills for Life level 1 programmes, and developed a model of excellence for Train to Gain programmes using mobile technology. They also created a bank of mobile materials (video clips) for use in teacher education delivery 'Talking Points'.

Truro College consortium

Truro College, a large tertiary college, and its MoLeNET partner, Launceston College, a large 11–18 school, are located in the centre and the eastern end respectively of the county of Cornwall. The institutions share a common profile in that a large percentage of students travel long distances to attend college/school and they serve a rural community. The MoLeNET project involved over 230 students and 44 staff and focused on the use of smartphones to enhance teaching and learning. They used a mixture of devices although the majority were Samsung Omnia I 900s. Some Apple iPhones and Nokia E-71 phones were also used.

Overall, the phones were well received by students across a wide range of courses including creative and media, photography, art, hospitality, ITCH, agriculture and retail. Levels ranged from 1 to 3 at both institutions. The versatility of these advanced mobile devices was both an asset and a liability in that the organisations underestimated the amount of time needed to properly train staff and students in their use. However, a number of creative outcomes were achieved and the further use of these devices in programmes was planned for September 2009.

Walsall College

Walsall College and its partners with the help of MoLeNET aimed to improve teaching and learning by developing a programme of study within ‘Achieving Together’ and for learners with severe learning difficulties and disabilities concentrating on using Nintendo DS Lites and their educational games. The research aim was to see how Nintendo DS Lites help learners with their studies. The project also aimed to improve teaching and learning by adapting SRS systems, recording equipment, E-PCs and MP4 players in lessons as well as outside college.

The project ran from February to June with deadlines for project objectives such as running focus groups, answering questionnaires and assessing and reviewing the technologies used. Learners were regularly updated as the project progressed.

The project involved 350 learners and 30 staff from various backgrounds including supported learning, deafness and sensory loss, disaffected and disengaged youths. The Borough of Walsall has a history of continued high unemployment with a culture of low aspirations and negative experiences of education.

The College of West Anglia

The College of West Anglia’s MoLeNET project investigated the use of mobile devices in physically demanding areas of its curriculum. These areas were land-based and outdoor activities and included agriculture, horticulture, water sports and mountaineering. The college’s land-based curriculum is delivered at two sites, some 40 miles apart, and caters predominantly for 14–19 year olds. Its outdoor activities curriculum is mostly delivered away from the college in places such as Snowdonia and the Scottish Highlands; its students tend to be older on average than its land-based students.

The college serves a large rural area covering half of Norfolk and areas of Cambridgeshire, notably the Fens. It is based at three campuses, two of which are approximately 40 miles apart, with the third being 15 miles away. The land-based provision is based at two of these sites.

Eighty-six students in total and seven teaching staff were on programmes that participated. Students typically travel for considerable distance and time to reach the college, with significant numbers coming from areas classified as deprived. The core and common item of equipment used in the project was the Panasonic Toughbook UMPC. The Ingress Protection Rating of this ruggedized device type was selected to enable the device to work effectively in hot, cold, dusty and wet environments.

Wirral Metropolitan College

The research project 'Employability' from Wirral Metropolitan College took place at college campus sites, community and workplace venues. Thirty staff participated including 16 course tutors and learning support staff. Ninety-two learners accessed the devices and 74 consented to participate in the research project. Most of the learners had learning difficulties and/or disabilities and needed to develop their employability skills particularly around verbal communication. There were 10 learners who were NHS employees enrolled on a Skills for Life workforce development programme.

A variety of handheld devices were used to facilitate the development of employability skills and the delivery of real work experience for learners with learning difficulties and/or disabilities so that learners collected and recorded a wide range of evidence of learning and skills for and in the workplace. Multimedia evidence of their skills and knowledge was collected to enable the development of a multimedia professional portfolio and CV and thus assist them to reach their goals of part-time or full-time employment, including supported employment.

The research outcomes will facilitate the continued development of people with learning difficulties and/or disabilities entering employment and support economic participation through sustainable employment opportunities.

References

Attewell J, Savill-Smith C and Douch R (2009) *The impact of mobile learning, examining the evidence*. LSN.

Douch R, Attewell J and Dawson D (2010) *Games technologies for learning, more than just toys*. LSN.

Douch R, Savill-Smith C, Parker G and Attewell J (2010) *Work-based and vocational mobile learning: making IT work*. LSN.

Force4 Enterprise Ltd, (2009) *Final report on interviews conducted with institutions involved in MoLeNet 2 Projects*.

Venkatraman N and Henderson JC (1993). 'Continuous strategic alignment: exploiting information technology capabilities for competitive success.' *European Management Journal* 11(2) pp139–49.



In recent years there have been amazing advances in consumer technology. The Mobile Learning Network (MoLeNET) initiative has enabled colleges and schools to harness some of this technology in order to modernise aspects of teaching, learning and training. The result has been improvements in learner engagement, retention, achievement and satisfaction.

This publication draws on the experiences of the 11,253 learners and 2261 teachers involved in the 2nd year of MoLeNET. It also reports the findings of research which sought evidence of the impact of introducing handheld and wireless technologies for learning. This evidence has been collected and analysed by LSN Technology Enhanced Learning Research Centre researchers and by practitioner researchers trained and supported by LSN.

The handheld technologies used by MoLeNET 2 learners included mobile phones, MP3/MP4 players (e.g. iPods), iPod Touch, netbooks, gaming devices (i.e. Nintendo DS and Sony PSP) and various tiny cameras and specialist scientific technologies. Positive reactions from practitioners include one teacher commenting that the introduction of mobile technology has had more impact on their teaching than anything else in the last 10 years adding 'there is no doubt that mobile technology has a place in the classroom'.

Another reported that 'learners in outreach centres or work-based environments felt better supported' and a senior manager told researchers 'it has transformed teaching and learning in some areas. It's opened up a world of new possibilities'.

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ISBN 978-1-84572-972-1
100103RS/07/10/2000
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