Becta leading next generation learning

Harnessing Technology: The Learner and their Context

Choosing to use technology: how learners construct their learning lives in their own contexts

Key findings from the first year of research

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A report for Becta**

March 2009

Becta leading next generation learning

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Introduction

In this research, we look at a wide range of people – children, adolescents and adults – who participate in some form of organised education and spend a substantial part of their lives as learners, across all the contexts of their lives.

We are particularly interested in the learning that takes place outside formal education, especially in the home. The increasing presence of digital technologies can transform how people engage with and manage learning. Learning is one of the main reasons for having a computer in homes where young people live. Whatever other uses young people make of a home computer, learning is almost always part of the picture of their technology use: young people may choose to use a computer as a convenient way of getting tasks done, to pursue other interests, or because it improves and enriches the quality of their learning experiences.

In this research, we investigate whether and how learners use the computers and other technologies that they have access to in their lives away from formal education, to see what kinds of learning go on in what kinds of setting, and to understand more about what may be built upon or avoided in the future. Our central aim is to explore how the ambitions for learning that are laid out in the Government's Harnessing Technology strategy can be achieved within the context of the technology-related opportunities and practices that young people experience.

This report draws on evidence from our first year's research which was conducted in three phases: Phase 1 involved mainly one-to-one interviews with learners aged 8-19+ across primary and secondary school sectors, FE and HE, and with some young learners in the care of children's services; Phase 2 involved in-depth case studies with some of these learners in their homes, with some additional cases to maintain the desired range of learners; and Phase 3 involved a representative survey of over 1000 young people aged 8, 12 ,14 and 17-19 in the UK. This report draws on work completed during the first year of research, as well as on focus group interview data.

Harnessing Technology strategy outcomes

In the following sections, we discuss evidence relating to each Harnessing Technology strategy outcome.

Engaged and empowered learners

Key findings:

- Although there is variation in terms of the enthusiasm that learners express about technologies, most learners now regularly engage in a wide range of technology-enabled activities for both pleasure and learning.
- The majority of learners across the age range, and especially as they grow older, regularly use digital technologies in the home for a range of purposes. Uses vary according to gender and age: younger people favour games and creative activities, and older people (especially girls) favour communication and (especially boys) game playing.
- A substantial proportion of learners multi-task while engaged in homework activities, in ways that are likely to be distracting for some and constructive for others.
- Parents tend to be anxious that their children are distracted from important studies by what they see as trivial or time-wasting online activities.

The findings from this first year of the research give a wide range of indications that a high proportion of learners across the age range make substantial use of technologies in their lives. It is certainly the case that very many young people have the opportunity to use technologies away from school. According to our national survey figures, approximately 82 per cent of learners nationally live in homes that are connected to the Internet, and 87 per cent live in homes that have at least one computer.

Following rapid growth over recent years, levels of Internet access are sufficiently advanced now to make it appropriate for the Government to aim for comprehensive connectivity for learners of school age through the Universal Home Access scheme.[1] It is not unreasonable to talk in terms of a tipping point: according to our survey, 95 per cent of learners of all ages use a computer at home, school or somewhere else, rising to 99 per cent of those aged 14 and over (but dropping back to 91 per cent for those aged 17–19).

Our survey responses indicate that in fact most young people hold positive attitudes towards technology: for example, 93 per cent agreed or agreed strongly with the

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[1] The Home Access programme began in November 2008 and aims to work towards universal home access by 2011.

statement 'you enjoy using technology' and 83 per cent agreed or agreed strongly with the statement 'technology is important in your life'. The findings from our initial round of interviews and case studies agree with that evidence and, although not all of those we spoke to profess enthusiasm and want to be seen as technology enthusiasts,[2] we did not come across anyone who does not use technology regularly (ie on most days of their lives).

Engaging experiences of using technology for the various kinds of preferred activities do not necessarily lead directly to engaging learning experiences. This, as we have learnt especially from our case study and focus group interviews with parents, is a particular crux in the question about engaged and empowered learning: do the technology-related enthusiasms of young people distract them from, or lead them towards, sustained technology-supported learning?

In previous reports,[3] we showed how many of our respondents – especially those of secondary age and beyond – tend to carry out a wide range of online activities in addition to their school work: chatting with friends, playing games, listening to music, watching videos, participating in social networking. Some learners prefer to merge their school work with other online activities, while others try to maintain a clear separation, completing their school or college work before logging on to their favourite sites. As the report on the Phase 3 survey[4] shows, there appears to be notable variation at different ages and across genders in whether multi-tasking is seen as supportive of learning or a distraction;[5] many parents with whom we spoke are unsure. Some learners claimed that they can handle online distractions but recognised that their parents prefer that they do nothing else while doing school work. Some (older) learners appear to have developed habits of technology use in which a seamless combination of personal interests, socialising and communication, and leisure and creative activities provide a context for largely self-directed and often resourceful uses of technology for formal learning. Equally, by their own admission, some learners find themselves so distracted by the things they do online that their attention to their studies suffers.[6] It is important to recognise that both versions of

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[2] A parent in one focus group interview described how his daughter was trying to modify her online behaviour so as not to appear too 'geeky' to her friends.

[3] See, for instance, six-monthly report 1, *The Learner and their Context – Interim report: Benefits of ICT use outside formal education.*

[4] *Harnessing Technology: The Learner and their Context – Mapping young people's uses of technology in their own contexts: a nationally representative survey.*

[5] Age and gender are important in understanding who engages in constructive and distractive multi-tasking while doing homework. Internet users aged 17–19 or 14 constructively multi-task significantly more often than Internet users aged 8 or 12. Internet users aged 14 or 12 engage in distractive multi-tasking significantly more often while doing homework than Internet users aged 8. Female Internet users are significantly less likely than male Internet users to engage in distractive multi-tasking while doing homework.

[6] See six-monthly report 1, *The Learner and their Context – Interim report: Benefits of ICT use outside formal education.*

multi-tasking can occur[7] and may be experienced by any learner on different occasions.

The specific technology-based activities that most engaged learners varied with age and gender, but the range of activities was relatively limited. In general, both qualitative and quantitative findings from our research indicate that primary-age children strongly favour games playing and engage in relatively little online communication. Older girls favour online communication and social networking more than boys do. Boys prefer games playing. There was widespread enthusiasm among older learners for watching videos, listening to and downloading music, shopping, watching TV on demand, engaging in social networking and playing online games. In addition, our case study data, especially, indicated the ways in which young people are keen to access computers and online resources for their learning and are confident in their ability to balance different technology-enabled enthusiasms so that their learning benefits more than it is hindered.

The key point in this section is that most young people are comfortable with using technology, and it engages them in a wide range of ways; most young people engage with technology for learning, but usually in competition with other technology-based interests.

Learner entitlement is met with all vulnerable groups supported

Key findings:

- Nationally, 82 per cent of learners have access to Internet-connected computers in their homes.
- There is a correlation between learners having personal access to the Internet and the extent to which they use the Internet for their school or college work.

The results from our national survey provide our chief source of data on learners' access to Internet-connected computers in their homes. (The qualitative work in this first year of research focused on mainstream learners and those who have adequate access to technologies.) Our survey shows that the number of Internet-connected households with learners in them has continued to grow steadily. Nationally, 82 per cent of learners have access to Internet-connected computers in their homes. However, as the *Digital Britain* report[8] and the need for the Universal Home Access

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[7] See the discussion of constructive and destructive multi-tasking in the Phase 3 report, *Harnessing Technology: The Learner and their Context – Mapping young people's uses of technology in their own contexts: a nationally representative survey.*

[8] Department for Culture, Media and Sport, and Department for Business, Enterprise and Regulatory Reform (2009) *Digital Britain: The interim report,* http://www.culture.gov.uk/images/publications/digital_britain_interimreportjan09.pdf

scheme make clear, access to the Internet is by no means universal yet. The extent of access is significantly related to age: eight-year-olds are the most likely *not* to have a computer in their homes; 12- and 14-year-old learners are the most likely to have a computer.

Most of the learners we spoke to in our qualitative phases live in homes with more than one computer. The survey figures, however, suggest that nationally only about half of households with computers own more than one. (The difference between the qualitative findings and the survey is explained by the fact that the qualitative research was conducted in the relatively prosperous south-east of England.)

According to the survey figures, 95 per cent of those with computers in the home have access to the Internet. The extent to which learners have personal access shifts steadily as learners grow older: of those with Internet access at home, 10 per cent of 8-year-olds, just over a third of 12- to 14-year-olds, and 63 per cent of 17- to 19-year-olds are able to go online in their bedrooms.

Opportunities for unsupervised access to the Internet present a number of potential concerns. However, the survey data also indicate a correlation between having personal access to computers and certain kinds of online activity that potentially add value to learning, including communicating, information seeking, creativity and online participation. Internet users aged 12, 14 and 17–19 who are still in formal education and who have personal access to a computer or laptop tend to use computers and the Internet significantly more often for producing homework than do learners without personal access.[9]

In the survey findings, home access is strongly associated with using the Internet for school work; our qualitative data show very strongly that learners almost invariably use the Internet to support them in some aspects of their school learning, whether looking up information on Google and Wikipedia, messaging friends about homework, or using the school's learning platform to download guidance and content for their work.[10]

Our initial stages of research with learners in vulnerable groups (which will be far more intensive in year two) indicate that the amount and quality of connectivity is more varied for these learners. For example, within the excluded learner group that we interviewed, one Year 11 male said that he does not have a computer, mobile phone or games console at home and that the Internet is too expensive. Another Year 10 girl in this group of learners explained that while she does not have a

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[9] See the Phase 3 report, *Harnessing Technology: The Learner and their Context – Mapping young people's uses of technology in their own contexts: a nationally representative survey.*
[10] See six-monthly report 1, *The Learner and their Context – Interim report: Benefits of ICT use outside formal education.*

computer or Internet access when living at home with her grandparents, she does have access when she visits her mother once a week. While the majority of excluded learners do tend to have access to at least one computer, they rarely reported any regulation of their time online by parents or guardians and showed less motivation for formal learning practices using technology. Technology was sometimes used to help them manage their more complex lives. Young offenders currently in institutions have very little or no access to the Internet as a rule; this, however, is an area about which we can say relatively little on the basis of this first year of work.

Technology adds value to family and informal learning

Key findings:

- In a high proportion of families, parents engage to some extent both in their children's learning and their technology uses; the highest engagement is directed toward primary-age learners.
- Parental engagement in children's uses of technology for learning varies considerably, with some working at the computer with children, others maintaining constant close attention to what goes on, and others setting rules or agreeing behaviours with their children, which are maintained primarily through trust.
- Parents tend to hold conflicting views about the educational value of technology, perceiving it as both an essential part of their child's learning experience and potentially a valuable tool, but also perceiving it as a threat to and distraction from traditional kinds of learning and from activities traditionally associated with childhood.
- In some cases, families regularly use the computer for shared activities: looking at photos, watching TV or DVDs, communicating with distant family members and sometimes following up topics of learning. In these cases, a computer in a central area of the home appears to become the nexus for a wide range of family activities and interests.

Of learners interviewed for the survey, 83 per cent stated that their mothers, stepmothers or female guardians help them with school work or other interests at least sometimes; for 70 per cent of learners, their fathers, stepfathers or male guardians help them in this way. In addition, 65 per cent of young people who still lived with their parents stated that their parents sit with them when using the computer at least sometimes, with 59 per cent saying that their parents suggest interesting websites for them to visit, and 67 per cent saying their parents help them use a laptop computer. The youngest age groups rated their parents' Internet support significantly more highly than did older age groups.

The context, therefore, of the mainly qualitative findings that follow is broadly one of widespread engagement of parents in their children's activities and uses of technology, with the greatest degrees of engagement directed at younger learners. Within that broad context, though, the qualitative findings indicate wide diversities of practice from home to home.

The family dimension to use of technologies in the home was of considerable significance. Parents (and others directly responsible for the care of young people, which includes step-parents, new partners of parents, grandparents and carers) involve themselves in their children's technology uses in general, and uses for learning in particular, in different ways and to different extents.[11] This variation occurs especially in relation to the age of learner, technology background of parents, family values, and external influences.

Young people rely on parents to invest in or sanction the use of technologies in the home. Many parents in our qualitative studies gave the reasons for having technologies as being partially at least in response to concerns about their children's educational success, and in order to prepare them for a future world of work in which the ability to use technology is likely to be essential.[12] Similarly, when parents have technologies in their homes for work or personal interest, the extent to which they let their children use them relates to the same concerns about their children's current and future success.

Parents' concerns about their children's success do not necessarily translate into direct engagement in their children's learning with technologies, or into much sharing of their children's technology activities. We are cautious about making generalisations either in terms of how much parents engage in their children's use of technology, or the reasons for that. Some parents believe passionately in giving their children the opportunity to use computers for their work but have no wish to go further than provide the computer. Other parents monitor virtually everything their children do, to the extent of regularly checking their Internet histories and monitoring children when they are online to make sure they are not engaged in risky online activity, are on task, and are doing their work with sufficient seriousness (which many fear is jeopardised by frequent use of Internet search engines and encyclopaedias).

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[11] In one case study visit, it was discovered that the grandmother of a Year 9 boy spent most evenings looking after him while his mother was at work; she described herself as 'not computer literate' and therefore spent very little time on the computer with him.

[12] See the Phase 2 case study reports, *Harnessing Technology: The Learner and their Context – Increasingly autonomous: learners using technology in the context of their family lives and beyond. Analysis of a series of case studies conducted with learners in their homes* and *Harnessing Technology: The Learner and their Context – Increasingly autonomous: learners using technology in the context of their family lives and beyond.14 Individual Case Studies.*

In a few of our case study home visits, we met parents and learners who seem to benefit from sharing activities that are primarily technology focused, such as learning how to design a website, or learning focused, such as providing regular support and advice via Skype to a son in his first term at university, which is something the parent values and looks forward to.

More often, parents tend not to sit alongside their children when using the computer, preferring a range of approaches from maintaining a fairly non-intrusive overview of activities, to close monitoring and strict enforcement of rules,[13] and sometimes also attempting to keep up to date with their children's progress and homework requirements via the school's learning platform. On occasions, parents take the close monitoring and rule-enforcement to considerable extremes, such as using a buzzer to signal the end of the time allowed for using the Internet; other families impose strict limits on how the Internet is used.[14] Even without such strict limits, parents tend to express concerns to their children about overuse of Google and Wikipedia.

As both the case studies and focus groups showed, many parents find it either difficult or inappropriate to sit alongside their children when they are using the computer, either for pleasure or for other purposes. Also, it may be difficult to find appropriate spaces in family homes for the computer. A number of parents see working on a computer as an individual activity and, as one parent of a child of secondary school age pointed out in a case study, school encourages children to work independently and find their own resources rather than depend on parents to do so.

In contrast, the mother of a six-year-old said in one of the focus group discussions that her son wants her to be more involved in what he does online, and asks her to sit alongside him when he is playing Club Penguin. Another parent said that her 14-year-old daughter often brings her Sims housing creations to show her, although she is aware that she is not able to help her daughter with using the Sims. Another

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[13] The survey data indicate that parents set rules about the following: how much time children spend on the computer (74 per cent of learners reported this); the kinds of computer games they can play (63 per cent); how much time they spend playing computer games (70 per cent); websites they can and cannot visit (71 per cent); the information they can give out online (73 per cent); and communicating online (69 per cent reported that their parents set rules about this at least sometimes). Younger age groups were significantly more likely to report that their parents regulate their use of technology more often than did older age groups.
[14] See the Phase 2 case study reports, *Harnessing Technology: The Learner and their Context – Increasingly autonomous: learners using technology in the context of their family lives and beyond. Analysis of a series of case studies conducted with learners in their homes* and *Harnessing Technology: The Learner and their Context – Increasingly autonomous: learners using technology in the context of their family lives and beyond.14 Individual Case Studies.*

parent, when asked if she helped her children much with the computer, said that when the children were younger 'the holding hands was done the other way round'.

The qualitative data shows that many parents have quite conflicting and contradictory feelings about the educational value of technology. Case study and focus group data all suggest that, however important technology may prove to be, for example for future employment, and however useful a tool technology may be for aspects of school work now, many parents believe that traditional modes of learning – especially books – have greater educational value. In one focus group, a couple of parents did suggest that interactivity put the computer on a par with books, and another suggested that the medium was not the point, but rather what the child did with it. But it was very clear that some parents feel and communicate anxiety about the relatively trivial nature of knowledge accessed from the Internet. In addition, parents shared concerns that computers can be 'too much of a good thing' (quoting a focus group parent) for the following reasons: they are too engrossing; they keep children up late or encourage them to spend too long in their bedrooms; they reduce children's time spent socialising with the family; and – a very commonly expressed concern – they involve children spending too much time indoors. (Of course, the concern about spending more time outside must be moderated by the fact that parents tend nowadays to be more cautious than before about allowing their children to go far from home.) In addition, mothers in the primary school parents' focus group spoke of problems such as a son who gets bad-tempered when made to stop playing games, and a daughter who can think of nothing to do if she is stopped from using the computer.

Many learners whom we spoke to made it clear that they are keen to do things outside, to get away from the computer on occasions, and to socialise, either with family or friends. It was clear from the first-round interviews[15] that learners also at times adopt a pragmatic approach and strategically comply with their parents' concerns, both in terms of demonstrating appropriate habits when using the computer for school work, and in not overusing the computer, in order to retain desired levels of access.

Each family deals with issues in its own way. It seems from our findings that many families are learning to deal sensibly with the considerable expansion in learners' access to technologies at home for learning, and in learners' options for using technology. Parents generally negotiate with and gradually devolve autonomy to learners; this process appears to work well when parents are concerned but not intrusive. While there is evidence both from the survey and case studies to suggest benefits for older learners (ie in secondary school and above) in being able to

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[15] See six-monthly report 1, *The Learner and their Context – Interim report: Benefits of ICT use outside formal education.*

develop their own uses of technology in the relative privacy of their own homes, parental anxieties are fewer when they can easily monitor their children's online activities in shared spaces within the house. Also, when technology is placed in a central position in the home, it can become a kind of nexus for family activities, through which a wide range of interests, activities and information can be shared. While this approach may not suit every family, one of the case studies,[16] for instance, suggests that a centrally placed computer screen encourages a high level of varied family learning.

Learners use technology confidently and safely to support their learning

Key findings:

- Young people generally rate their technology skills quite highly, with variation relating to age, gender and specific activities. Boys and older users are the most confident in their technology skills.
- Boys and older users are the most confident when it comes to taking a problem-solving approach to using the computer and the Internet effectively.
- Learners are generally confident about carrying out Internet searches but are aware that both teachers and parents have reservations about the number and quality of searches they carry out online.
- Learners and their parents are increasingly conscious of a range of possible risks associated with using the Internet, and to some extent act carefully.
- Younger learners are very unclear about the nature of dangers online, confusing warnings about threats to computers (ie viruses) with threats to themselves.
- Some older learners are over-confident about their levels of security when placing personal information online on social networking websites of various kinds.

Confidence

Our survey data show that young people generally rate themselves quite highly in their ability to use various kinds of technology.

The survey showed that eight-year-olds tend to rate themselves less highly than other age groups (particularly for using computers, the Internet and mobile phones), but rate themselves more highly than those aged 17–19 on using computer games

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[16] See the Phase 2 case study report, *Harnessing Technology: The Learner and their Context – Increasingly autonomous: learners using technology in the context of their family lives and beyond. 14 Individual Case Studies*, case study 7.

or console games. Boys and older Internet users tend to perceive their ability to use the Internet more highly: overall, male Internet users rate their ability to use the Internet significantly more highly than female Internet users do; eight-year-olds rate themselves as having the least Internet ability, and 17- to 19-year-olds the most. Boys and older Internet users also tend to perceive their ability to find information online more highly: 12-year-olds rate their online information-seeking ability significantly lower than those aged 17–19. Older male Internet users rate their ability to find information online significantly more highly than female Internet users do. In the same way, boys and older learners generally appear more likely to employ a problem-solving approach to their uses of technologies.

These findings are in accord with our qualitative data, and especially with extensive findings in the Phase 1 interviews, where we were struck by the extent to which learners reported being the key agents in the process of finding out how to use the computers in their homes, being willing to experiment, and being confident in drawing on a wide range of knowledge sources from family members to neighbours, peers and online sources.[17] (Given the nature of our qualitative sample, it would not have been possible to make judgements about any gender difference in this confident problem-solving approach, so it is interesting to have an indication from survey findings of technology confidence as being more characteristic of boys than girls.)

The survey findings also suggest that having confidence in using technology correlates with particular uses of the Internet. Secondary-age and older Internet users who are comfortable with taking a problem-solving approach to technology tend to use the Internet significantly more often for communicating, information seeking, entertainment, creativity and participating, which is characteristic generally of confident Internet users.[18]

While we did talk to a few learners in the qualitative phases of the research who expressed a lack of confidence with knowing how to use different aspects of technology, for the most part we came across learners who are content and often keen to experiment with their uses of technologies, and especially to explore the Internet for a range of purposes. Some learners professed to question the acceptability of using online search engines and encyclopaedias, but this was often explicitly done because they knew adults who do not approve of these approaches, rather than because learners themselves have reservations about their ability to

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[17] See the Phase 1 report, *The Learner and their Context. Report of Phase 1 of the qualitative data gathering: Interviews with learners*, section 'Processes of learning about using technologies: collaboration, agency and metacognition' in the main text and in Appendix 1.

[18] In addition, the value of a confident problem-solving approach appears to extend beyond being able to cope with problems of using technology, towards habits of using the Internet and computers more often for producing and researching homework.

search online for information.[19] As the Phase 1 interviews demonstrate, learners' confidence with their ability to search for information is not always justified, especially with regard to the practices described by primary-age learners; in the case studies, however, some older learners describe quite sophisticated procedures for searching the Internet.[20]

Learners' confidence does of course have positive and negative aspects. Confident learners have greater capacity for problem solving and can take control of learning to use technology for their own needs. On the negative side, some learners may be too easily satisfied with the results of poorly conducted Internet searches and, even more seriously, may be over-confident about their capacity to avoid risks of a personal nature when online.

Safety

As the evidence review pointed out, there are a number of risks in using the Internet and other technologies, such as online bullying and harassment, breaches of privacy, hoax emails, credit card fraud, antisocial behaviours and Internet addiction. There has over many years been sustained talk in the media about the risks to young people of predatory paedophiles, and this is something that both parents and teachers now regularly warn children about. Safety is an increasingly complex issue because it seems that young people are indeed aware of safety issues, but not necessarily of the right ones or in the right ways.

Levels of confidence in being able to keep safe on the Internet varied among our national sample according to gender and age. Broadly speaking, female Internet users tend to have greater concerns about online safety than male Internet users do. Confidence levels are highest for older Internet users (aged 17–19), with slightly lower levels of confidence among secondary-age pupils, and a notably lower level of confidence among eight-year-olds.[21]

Most learners and parents whom we interviewed are aware of issues of safety online, to some degree. Sometimes, in the case of parents, this awareness tends to be disproportionate to problems being experienced or likely to be experienced, and reflects current levels of concern expressed in the media about young people and

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[19] See the Phase 1 report, *The Learner and their Context. Report of Phase 1 of the qualitative data gathering: Interviews with learners*, section 'Learners' technology-related proficiencies, skills and understandings'.

[20] See *Harnessing Technology: The Learner and their Context – Increasingly autonomous: learners using technology in the context of their family lives and beyond. 14 Individual Case Studies*, case study 7.

[21] See the Phase 3 survey report: *Harnessing Technology: The Learner and their Context – Mapping young people's uses of technology in their own contexts: a nationally representative survey.*

the Internet.[22] Conversely, some learners believe that their somewhat incomplete understanding of how to stay safe online is sufficient; this tended to be the case especially with the younger secondary learners. Primary-age learners, in line with the survey data, tend at times to be disproportionately fearful of what they might encounter online.[23]

Our survey data also show that a substantial proportion of young people are relatively careful about the information they give out to others online: Internet users in our survey sample who met people online that they didn't know in person were most likely to give out information about their interests and hobbies (78 per cent), their ages (71 per cent) and email addresses (65 per cent), and less likely to disclose their birthdays (29 per cent), their phone numbers (21 per cent), where they live (16 per cent), or their parents', brothers' or sisters' names (7 per cent). Of the 55 per cent of those Internet users surveyed who have a profile on a social networking site, 74 per cent allow only certain people to see the page, 23 per cent let anyone see it, and just 3 per cent do not know who can see the profile.

Over a quarter of Internet users in our sample have got to know someone online that they have not met in person. Internet users aged 17–19 were most likely to have got to know someone online, and eight-year-olds the least likely. Social networking sites are the most popular location for older learners (secondary age and above) to get to know people online. Of those who have met someone online whom they didn't know in person, 28 per cent went on to meet that person face to face. The number in each age group who meet someone in person whom they first encountered online is very small. Generally those from older age groups are more likely to do this: 15 per cent of eight-year-olds, 15 per cent of 12-year-olds, 25 per cent of 14-year-olds and 37 per cent of 17- to 19-year-olds who had got to know someone online whom they did not know before then went on to meet the person.

That younger learners are the most cautious about people whom they meet online is very much in line with our qualitative findings: the primary-age children were the least certain about the exact nature of the dangers on the Internet, but quite strongly aware that dangers of some kind exist. Among those in this age group with whom we spoke, we noted a confused sense that some kind of improper or frightening material might exist, which was mixed with anxieties about viruses and paedophiles.

Our own survey found a widespread concern about computer viruses across the age range; this finding, as the evidence review pointed out, is in line with the findings of

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[22] A mother in one focus group explained that she cancelled her children's Bebo accounts after another parent told her Bebo was unsafe compared with MSN. She said that her children were in tears, but she had held firm.
[23] See the information on e-safety awareness in the six-monthly report 1, *The Learner and their Context – Interim report: Benefits of ICT use outside formal education.*

other studies, such as the UK Children Go Online (UKCGO) survey.[24] (Computer viruses, in interview data, appear to be poorly understood by younger learners and therefore threatening.)

The survey encountered a small but not insignificant proportion of young people who have experienced cyber-bullying: 10 per cent of the respondents reported that they have either been sent an upsetting message or picture or someone has posted a picture of them on a computer or mobile phone. (Note that these figures are at odds with the finding of the 2004 UKCGO study[25] that nearly a third of 9- to 19-year-olds who went online at least once a week have received unwanted sexual or nasty comments.) Those who experienced cyber-bullying tend to tell someone: while the numbers in each age group are small, and the findings should be interpreted with caution, it does appear that younger Internet users tend to tell their parents, and older Internet users tell their friends.

Our qualitative data suggest that young people, despite being aware in general of Internet risks, vary considerably in their understanding of how to use privacy settings in social networking sites. As the quantitative data indicates, most learners know how to use privacy settings, but some still appear to behave slightly recklessly. Given an ever-increasing attention to this issue in the media, and improved arrangements within social networking sites themselves, it will be interesting to see whether further progress in safe use of social networking sites occurs over the next two years.

Improved personalised learning experiences

Key findings:

- Most learners whom we spoke with use technologies for homework in ways that improve the appearance and content of their work without actually leading to personalised learning experiences.
- A minority of students provided striking evidence of personalised approaches to their learning. These approaches can broadly be divided into two types: making original and effective use of the more ordered and structured aspects of new technologies, and engaging in inventive and multi-tasking approaches when learning.
- We encountered little evidence of distinctly flexible learning approaches.

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[24] Livingstone, S. & Bober, M. (2003) *UK Children Go Online: Listening to young people's experiences*, London School of Economics and Political Science. Available at: http://eprints.lse.ac.uk/388/1/UKChildrenGoOnlineReport1.pdf
[25] Livingstone, S. and Bober, M. (2005) *UK Children Go Online: Final report of key project findings*, LSE.

- Learners who engage in inventive and multi-tasking approaches to their learning tend to establish a seamless array of technology practices that productively combine their personal enthusiasms with their studies and future career plans.
- Employers from a range of industries are interested in drawing on the potential of Web 2.0 practices in ways that may relate well to the skills of learners who explore and experiment with Web 2.0 practices for their own interests.

The qualitative data from Phases 1 and 2 of this first year's research offer a number of different perspectives on improved personalised learning experiences. (We take improved personalised learning experiences to involve, as *Harnessing Technology: Next generation learning* explains, 'learning which reflects learners' interests, preferred approaches, abilities and choices, and tailored access to materials and content'.[26] It seems reasonable to suppose that learning which takes place in learners' own contexts and is supported by the technologies available will tend to be self-managed and strongly influenced by learners' interests, inclinations and self-devised methods for doing school or college work or for following up personal interests, but this is not always the case in reality. The evidence from our Phase 1 interviews suggests that a substantial proportion of learners have established a set of practices for using technology to do their homework, but that these practices are often superficially developed, represent the quickest way of getting the job done, and are similar from person to person. The most commonly used practice is to use Google and Wikipedia for information to put into homework, Word to write it up, and a small degree of personalised formatting to make it look acceptable. As one Year 10 pupil put it: "basically copy and paste then edit it and, you know, make it my own", which covers a range of possible levels of engagement from a productive meaning-making experimentation with fonts and styles[27] to obscuring the fact that work has been copied from the Internet. From the reports of some learners whom we interviewed in Phase 1, it appears that homework is sometimes the least inventive and personalised thing that younger learners do with the help of technologies.[28]

When looking for evidence of personalised learning, we think it important to look for evidence of practices that show, to some degree, learners making individual decisions, thinking about how they can use the technologies available to enhance learning, and thinking of other uses of the technology. The evidence from the Phase 2 case studies is particularly informative because it shows some of what learners

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[26] Becta (2008) *Harnessing Technology: Next generation learning*, p.33.

[27] Facer, K., Furlong, J., Furlong, R., and Sutherland, R. (2003). *Screenplay: Children and Computing in the Home.* London: RoutledgeFalmer.

[28] See *The Learner and their Context. Report of Phase 1 of the qualitative data gathering: Interviews with learners.*

actually do when working with their computers, as well the range of applications that some learners (especially the older ones) combine when learning. Those learners who adopt a markedly personalised approach to their learning when using technologies can be categorised in two distinctive groups:

- Highly ordered, self-managing learners
- Learners who take a less ordered but more inventive or even experimental approach in which they construct their own technology *modus operandi* characterised especially by a multi-tasking approach.

With regards to the first group above, we were struck by the number of students we observed who have developed highly ordered systems for managing their work and other activities on the computer. These systems tend to use application-based methods such as using Windows Explorer or the organisational structure of Bebo. Explorer's grid-like, hierarchical folder organisation was used by one learner (in Year 11) as a means of managing her increasing amount of GCSE coursework in different subjects, which she carried to and from school on a USB memory stick.[29] Another learner (in Year 5) with considerably less school work to manage used a similar system to organise into her own system of folders the outputs from personal activities such as self-motivated story writing and creating illustrations with the computer. A Year 9 boy demonstrated how he carefully constructed his Bebo homepage so that his friends, interests and topics of current interest are presented in neat and accessible ways that he finds satisfying. (This boy is also keen on using his school's VLE to help him manage and review his work commitments.[30])

With regards to the second group above – learners who take a less ordered but more inventive approach – we talked to a range of students of different ages, both in Phases 1 and 2, who have developed very individual and complex patterns of working, which, as a rule, encompass more than school or college work, but within which they are able to develop effective and engaging ways of completing their prescribed learning activities. As committed multi-taskers,[31] these learners are possibly less concerned with ordering their work than with maintaining a high level of stimulus and engagement. By contrast, the Year 11 girl referred to in the previous paragraph stated clearly that she does not like to have instant messaging on when working, because the possibility of distraction annoys her. (It should be noted that

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[29] See *Harnessing Technology: The Learner and their Context – Increasingly autonomous: learners using technology in the context of their family lives and beyond. 14 Individual Case Studies*, case study 2.

[30] See *Harnessing Technology: The Learner and their Context – Increasingly autonomous: learners using technology in the context of their family lives and beyond. 14 Individual Case Studies*, case study 11.

[31] See the Phase 1 report, *The Learner and their Context. Report of Phase 1 of the qualitative data gathering: Interviews with learners*.

the survey data suggest that constructive multi-tasking is more common that distractive multi-tasking.[32]) Survey evidence confirms the construct of distractive/constructive multi-tasking that emerged first from the qualitative data analysis. Constructive multi-tasking involves learners completing activities such as homework while keeping a search engine and instant messaging system open and playing music. Distractive multi-tasking, on the other hand, involves watching videos and TV on demand on the computer while playing computer games and attempting to do homework.

Older learners, notably students in further education (FE) and higher education (HE), appear to be particularly adept at constructing elaborate multi-tasking technology practices, usually within their study bedrooms, where they can bring together the full range of technologies that interest and support them during their studies. These practices generally have the appearance of personalised learning: both the hardware in learners' rooms (eg musical instruments and programs; cameras and photo-editing software) and the organisation of their regular online habits, including their connections to the university's VLE, constitute each person's unique means of managing interests and work in seamless ways. With such learners, personal interest appears to play an increasingly central role in their learning. In some instances, there are signs of such interests beginning to determine the nature of the learning undertaken and the means for doing that, even in secondary school.

Learners able to exercise choice among flexible learning options

We have not seen anything notable in respect of flexible learning options in any aspect of our research, with the exception perhaps of a small number of FE and HE students who move quite freely between home, college and other locations.[33]

As far as the mainstream school-based learners are concerned, home is not a place where they can choose to work, but simply one of the locations where work has to be done. Most of the learners we observed take fairly straightforward and utilitarian approaches to their home learning. For example, the student in the previous section who uses a USB stick to transport her work between home and school exemplifies how home learning can be dictated by school requirements: the home computer is used as a kind of outpost of school, rather than as an attractive alternative location

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[32] See the discussion of multi-tasking in the Phase 3 Report, *Harnessing Technology: The Learner and their Context – Mapping young people's uses of technology in their own contexts: a nationally representative survey.*
[33] This relates directly to case study 12, an FE learner (see *Harnessing Technology: The Learner and their Context – Increasingly autonomous: learners using technology in the context of their family lives and beyond. 14 Individual Case Studies*) and a number of the learners in HE we spoke in Phases 1 and 2 who, through their uses of technology, successfully blur the boundaries between locations for learning to the extent that they are able to create more effective technology-supported learning in their own rooms than within university work spaces.

for learning in its own right where new approaches and new levels of engagement are explored.

The current period of implementation of schools' VLEs provides an opportunity to explore ways in which learners in the home can connect to the school so that they are both reassured that they are keeping up with requirements and also offered goals and guidance for learning in the home that reflect the freedom to explore and experiment that is not currently feasible in school. If the process of VLE development is informed by how the most empowered learners (those who possess the skills, support and freedom within the home to develop wide-ranging and flexible online behaviours) spend their time with technology in their own contexts, it is possible that learners more generally can be helped to make better use of their home connectivity than to merely produce the kind of work they normally do in class when at school. If we are going to achieve choice among flexible options, we have to recognise and exploit the differences between what can take place in the home and in school.

Engaging learning experiences that support deep and higher order learning

We encountered a number of learners across the age range who use technologies in ways that arguably result in engaging learning experiences which possibly involve instances of deep and higher order learning. In the Phase 2 case study report, we identified in our data two themes that relate to learners' technology-related practices:

- innovative, intensive users
- formation of learning careers through personalised home technology activities.[34]

Innovative, intensive users:

Learners who use technology intensively, often in innovative ways, are invariably technology enthusiasts who operate in well-resourced learning situations in which they have some degree of freedom in how they use resources. These learners generally receive strong support from parents in addition to being well resourced by them. As they grow older, learners tend to become highly self-motivated and, within the home, self-sufficient, although they are usually connected to strong peer networks outside the home. It appears less likely that learners with parents who regulate and intervene to a large extent develop innovative and intensive uses of the technologies at their disposal.

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[34] See the section on engaging learning experiences that support deep and higher order learning in the Phase 2 report, *Harnessing Technology: The Learner and their Context – Increasingly autonomous: learners using technology in the context of their family lives and beyond. Analysis of a series of case studies conducted with learners in their homes*.

Sometimes, high degrees of access to and freedom to use resources create problems, as a Year 10 boy (FJ) revealed in the Phase 1 interviews: he acquired a long-term addiction to playing online games.[35] Negative as that experience was, it arguably formed part of the self-directed, peer-supported explorations of technology and the Internet that helped him to become an engaged and empowered learner, with an unusual degree of self-awareness: "I think you learn to be more safe of yourself, you learn to be more protective. You learn to be more social … and of course you learn, you get better knowledge and stuff, so it all comes down to that.

FJ works alone in his bedroom and lives with a single parent who does not directly involve himself in his son's activities. CE uses his technology in full view of his mother, who intervenes in a number of ways but is also learning to respect and encourage her son's self-directed explorations; CE has become fascinated with a music-composition program funded by his grandfather, and is seriously considering music as a choice at A-level.[36]

In a similar fashion, the primary and secondary learners who appear to be confidently developing their skills and approaches are doing so within supportive but not strongly regulative family settings (although learners sometimes perceive themselves as over-regulated). The primary school learners do not, as a rule, draw on peer networks, but secondary school learners more generally do.[37]

Judging by the intense levels of interest which many learners display in their work, as the case studies show, it is reasonable to suggest that learners experience specifically cognitive benefits from their uses of computers: through a combination of their own experiments, parental and peer guidance, and the demands of their learning careers, they construct their own ways of solving problems and carrying out their learning. CE, for instance (referred to above), describes a process of carrying out Google searches that he appears to have devised entirely through his own intellectual efforts (spurred on by a mother who suspects that Internet searches are almost invariably trivial).

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[35] In his Phase 1 interview, FJ explained that he was helped out his games addiction by seeing a YouTube video on the subject: "It was actually a friend who showed it to me because he was actually worried about me at the time because I was so addicted to it. He showed me that clip and I was like, 'Oh no, I can't do that.'"

[36] See *Harnessing Technology: The Learner and their Context – Increasingly autonomous: learners using technology in the context of their family lives and beyond. 14 Individual Case Studies*, case study 7.

[37] Our survey findings raise some interesting and complex perspectives: having friends who are engaged in technology seems more important than parental involvement in understanding types of use of the Internet: Internet users aged 12, 14 and 17–19 who have friends engaged in technology tend to use the Internet more often for communicating, information seeking, entertainment and participating. Internet users who perceive their parents as supportive tend to use the Internet more often for creativity, and those Internet users who perceive their parents as regulating their technology use and who have parents who are not supportive are more likely to participate online.

Formation of learning careers through personalised home technology activities:

We spoke to a number of learners in FE and HE whose interest in and uses of technology may be seen to involve deep and higher order learning in two distinct respects: through intensive cognitive engagement and by virtue of learners becoming increasingly aware of their work-related needs as they move towards employment.

A number of those interviewed both during the Phase 1 and Phase 2 data gathering appear to use technology to link their personal interests and enthusiasms with their study requirements and aspirations for future employment.[38]

Learners' personal enthusiasms often go back a long time and tend to involve very specific uses of technology, such as for photography, journalism and music production. Students whom we interviewed who have strong personal, academic and potentially professional interests also tend to engage heavily in online networks, blogs and content-sharing sites.

We have begun to explore with employers the question of how valuable to their businesses are the technology-related skills that a substantial number of young people (but not all) acquire through their specialised and their everyday uses of technology and the Internet. Most of the employers we spoke with are keen to incorporate technology-related skills into their activities (indeed, some are already well advanced with this) and are therefore also keen to recruit new employees who are competent and confident in using technology. It is clearly the case, though, that what employers see as desirable new Web 2.0 skills may be different from what young users are becoming accustomed to doing online.

The key notion of Web 2.0 can perhaps be best described as creating opportunities for new forms of non-hierarchical participation in communities of shared interest in which 'members believe their contributions matter' and encounter 'opportunities for peer-to-peer learning, […] the development of skills valued in the modern workplace, and a more empowered conception of citizenship.'[39] Employers have told us that they see potential benefits in using such Web 2.0 resources for the following: communicating with customers (an engineering company); drawing on the collective wisdom of the workforce in developing new procedures for pricing their goods (a multinational company in the field of domestic consumer goods); developing new approaches to training (an e-learning company); and improving the quality of

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[38] See *Harnessing Technology: The Learner and their Context – Increasingly autonomous: learners using technology in the context of their family lives and beyond. 14 Individual Case Studies*, case studies 10, 12 and 13.
[39] Jenkins, H., Clinton, K., Purushotma, R., Robison, A.J. and Weigel, M. (2006) *Confronting the Challenges of Participatory Culture: Media education for the 21st century*, The MacArthur Foundation.

communications, especially the free flow of new ideas, between junior and senior members of a large technology company by using blogs. At the same time, employers tell us that they want to ensure that recruits possess strong basic technology skills, specialist skills relevant to particular jobs, and secure and 'well-educated' technology practices that are appropriate to the requirements and procedures considered essential to securely manage technology within a large organisation. Nonetheless, employers in many industries are keen to welcome new employees who can offer reliable technology skills and behaviours and are capable of professionalising their personal Web 2.0 habits and skills to meet the new demands of the 21st century workplace.[40]

The HE learners – especially those on vocationally oriented courses where they are guided from an early stage to take appropriate measures to gain employment on graduating[41] – are quite realistic about how they must develop and adapt their personal interests to make themselves attractive to potential employers, especially during a period of rising graduate unemployment. (We will pursue this area in depth during year two of the project.)

Provider capability in place to support home and extended learning

Key findings:

- Older learners, especially those in HE, seem to approve of and benefit considerably from their uses of VLEs.
- Where access and support are well developed, learners in secondary schools are beginning to benefit from the availability of VLEs.
- Many parents are positive about the opportunity to participate in school VLEs.

The final aspect of the Harnessing Technology strategy outcomes that is relevant to the Learner and their Context project relates to the ways in which learners' experiences of learning in the home are mediated by the 'enabling infrastructure and processes' of their main educational institution, and the extent also to which that enabling infrastructure gives them access to 'high quality, tailored resources'.

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[40] See, for example, [http://www.Jmorganmarketing.com/there-is-no-roi-from-social-media] and [http://lornali.com/online-reputation-management/6-steps-for-creating-a-social-media-marketing-roadmap-plan].

[41] See *Harnessing Technology: The Learner and their Context – Increasingly autonomous: learners using technology in the context of their family lives and beyond. 14 Individual Case Studies*, case study 13: RU states that most of her activities involving digital technologies also relate to "trying to find a job... as a journalist and photographer" in one way or another, including simply gaining some recognition in the field through her blogs.

Learners in the two HE institutions we visited appeared generally very satisfied with the VLE provision – in both cases through Blackboard – that they have access to. In both institutions, this provision seems to have become an accepted and essential aspect of the infrastructure that supports and enables learners' studies. It also appears that the VLEs blend well with learners' various strategies for working and support some degree of flexible learning. The Phase 3 survey showed that learners aged 17–19 rate the provision in their educational institutions most highly.

FE students are less impressed than HE students with the quality of their provision; this is likely to reflect a lower level of investment in their colleges' ICT provision generally.

School users make considerably less use of VLEs than older learners, but it is interesting to note that in the short time between Phase 1 and Phase 2, some learners were beginning to talk more about making use of their schools' VLEs. And nationally, according to our survey, the number of secondary-age learners who use their schools' VLEs either for finding resources or for homework information is now well over 50 per cent.[42] Use of VLEs is an area where we may see dramatic change over the next two years; if, as planned, we return to the learners interviewed during the first year and also re-run the survey, use of VLEs will form a central focus of our research.

The evidence from this first year suggests a number of reasons why a well-implemented and well-maintained VLE is likely to make a major impact on learners' experiences of school-related learning in the home: many learners whom we spoke to in Phases 1 and 2 appear to need clearer information about homework tasks when at home than they are currently able to access; learners experience considerable difficulty transferring work backwards and forwards between school and home and submitting work (including problems printing work out), all of which would be made easier with working systems for storing work on school servers and submitting work to teachers; and parents are sometimes keen to keep up to date with children's assignments and progress. Above all, our research suggests that if learners are going to use technologies in a sustained and productive way, this is likely to happen more in the home than at school.[43] This is not to say that learners in general are negative about their school experiences (roughly three-quarters of those surveyed expressed satisfaction with provision), but rather that opportunities for self-

[42] See the Phase 3 report, *Harnessing Technology: The Learner and their Context – Mapping young people's uses of technology in their own contexts: a nationally representative survey,* Figure 22.
[43] According to the Phase 3 report, *Harnessing Technology: The Learner and their Context – Mapping young people's uses of technology in their own contexts: a nationally representative survey*, 73 per cent agreed or strongly agreed with the statement 'You use more technology at home than you do at school, college or university'.

directed and innovative approaches to learning, and even for straightforward completion of tasks, appear to be significantly greater in the home.

Conclusions

Key findings from each of the sections above are presented here in order. These are followed by a discussion of key issues.

- Although there is variation in terms of the enthusiasm that learners express about technologies, most learners now regularly engage in a wide range of technology-enabled activities for both pleasure and learning.
- The majority of learners across the age range, and especially as they grow older, regularly use digital technologies in the home for a range of purposes. Uses vary according to gender and age: younger people favour games and creative activities, and older people (especially girls) favour communication and (especially boys) game playing.
- A substantial proportion of learners multi-task while engaged in homework activities, in ways that are likely to be distracting for some and constructive for others.
- Parents tend to be anxious that their children are distracted from important studies by what they see as trivial or time-wasting online activities.
- Nationally, 82 per cent of learners have access to Internet-connected computers in their homes.
- There is a correlation between learners having personal access to the Internet and the extent to which they use the Internet for their school or college work.
- In a high proportion of families, parents engage to some extent both in their children's learning and their technology uses; the highest engagement is directed toward primary-age learners.
- Parental engagement in children's uses of technology for learning varies considerably, with some working at the computer with children, others maintaining constant close attention to what goes on, and others setting rules or agreeing behaviours with their children, which are maintained primarily through trust.
- Parents tend to hold conflicting views about the educational value of technology, perceiving it as both an essential part of their child's learning experience and potentially a valuable tool, but also perceiving it as a threat to and distraction from traditional kinds of learning and from activities traditionally associated with childhood.
- In some cases, families regularly use the computer for shared activities: looking at photos, watching TV or DVDs, communicating with distant family members and sometimes following up topics of learning. In these cases, a computer in a central area of the home appears to become the nexus for a wide range of family activities and interests.

- Young people generally rate their technology skills quite highly, with variation relating to age, gender and specific activities. Boys and older users are the most confident in their technology skills.
- Boys and older users are the most confident when it comes to taking a problem-solving approach to using the computer and the Internet effectively.
- Learners are generally confident about carrying out Internet searches but are aware that both teachers and parents have reservations about the number and quality of searches they carry out online.
- Learners and their parents are increasingly conscious of a range of possible risks associated with using the Internet, and to some extent act carefully.
- Younger learners are very unclear about the nature of dangers online, confusing warnings about threats to computers (ie viruses) with threats to themselves.
- Some older learners are over-confident about their levels of security when placing personal information online on social networking websites of various kinds.
- Most learners whom we spoke with use technologies for homework in ways that improve the appearance and content of their work without actually leading to personalised learning experiences.
- A minority of students provided striking evidence of personalised approaches to their learning. These approaches can broadly be divided into two types: making original and effective uses of the more ordered and structured aspects of new technologies; and engaging in inventive and multi-tasking approaches when learning.
- We encountered little evidence of distinctly flexible learning approaches.
- Learners who engage in inventive and multi-tasking approaches to their learning tend to establish a seamless array of technology practices that productively combine their personal enthusiasms with their studies and future career plans.
- Employers from a range of industries are interested in drawing on the potential of Web 2.0 practices in ways that may relate well to the skills of learners who explore and experiment with Web 2.0 practices for their own interests.
- Older learners, especially those in HE, seem to approve of and benefit considerably from their uses of VLEs.
- Where access and support are well developed, learners in secondary schools are beginning to benefit from the availability of VLEs.
- Many parents are positive about the opportunity to participate in school VLEs.

The overall picture to emerge from the first year of our research is of a remarkable ongoing expansion in the variety of technology that learners are able to use in their lives away from school and college, and also in what they are able to do with the technology.

It is clear that the majority of learners do not necessarily use these increasingly high levels of access as effectively as they might when it comes to their learning, but we have come across a large number of interesting instances in our qualitative data that illustrate how much can be achieved in the right circumstances. It is clear that not all young people are technology enthusiasts, but the combined evidence of our qualitative and quantitative data shows that most young people are in a good position to make increasingly productive use of technology for learning; the minority who are already achieving very positive uses provide interesting evidence of what form these uses might take.

The role of the family is central in enabling and supporting young people's learning with technologies. Families, whatever level of engagement they currently have in their children's learning, are generally concerned to do the right thing for their children, which in relation to technology means making sure that it is available and then trying to steer its use towards learning and discourage negative and distracting uses. Family help is invaluable, but we believe it should be informed by talking with young people about what they are doing and learning more about their skills; this should lead to an increased readiness to let young people experiment on their own, especially as they grow older. The messages from the media are generally negative about new technologies, and parents need more positive guidance about what is and is not acceptable or useful for children to do, and about how activities that might be perceived in a negative light may sometimes constitute the first steps towards confident and inventive technology use.

Schools should be encouraged to take the development of inclusive, user-friendly and up-to-date VLEs very seriously, especially during this crucial period of implementation. Our evidence suggests that VLEs can add considerable value to the learning that goes on in learners' own contexts, both through the information they can provide to parents and learners about progress and how to carry out learning tasks, and for the structure they offer learners in managing their work at home.

At the same time, schools need to be helped to think about how best to make use of the home environment for learning, now that most – and soon all – learners are connected to the Internet. If inventiveness and exploration are the hallmarks of how the most enthusiastic and productive technology-enabled learners approach their activities, care must be taken to avoid turning the experience of using technology at home into a demoralising outpost of the classroom.

Finally, we want to emphasise that we consider the notion of the young person as 'born digital' to be highly unhelpful. Young people have a special relationship with digital technologies because they are good at sharing information with one another, especially about the things they all enjoy and find useful. But most young people have substantial gaps in their knowledge about how to use technologies well, and many have no intuitive feel for them at all, even if they are inclined to experiment and explore. As well as encouragement and some degree of freedom to experiment, learners need appropriate teaching and information if they are to benefit from the technologies in their lives. Topics include how to participate fully in the culture of the Web 2.0 world, which many are only superficially aware of; this is certainly as important as being taught how to use spreadsheets and databases, and has considerable implications for teachers. The long-term implications of Web 2.0 knowledge for study, social life, employment and democratic participation mean that this is an area of young people's learning that must be supported and encouraged in the long term.