

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

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Executive summary

Overview

This report presents findings from the third phase of data gathering during the initial year of the Learner and their Context research project, being carried out at the Oxford University Department of Education in association with Becta.

The aim of the Learner and their Context research is to gain up-to-date understandings about how a wide range of learners experience new technologies in their lives outside formal education, and the learning made possible by those experiences. The research is being conducted in support of the Government's Harnessing Technology strategy.

This third phase of data gathering consisted of a survey of 1,069 young people who are representative of those aged 8, 12, 14 and 17–19 in the UK. The purposes of the survey were to:

- understand the use of a range of different technologies by young people in their lives outside formal education
- provide a representative overview of young people's uses of technologies that complements the other two qualitative phases of data gathering for this project that were conducted in year 1.¹

Uses of technology by young people

Young people tend to be relatively high users of technology whether at home or school, or somewhere else: 95 per cent of young people aged 8, 12, 14 and 17–19 use a computer, 88 per cent use the internet, 82 per cent play computer or console games, 76 per cent use a mobile phone, 70 per cent use an MP3 player, and 53 per cent use a digital camera.

At the ages of 12 and 14, the use of a computer and the internet is almost universal: 99 per cent of 12-year-olds and 99 per cent of 14-year-olds use a computer at home or school, or somewhere else, and 97 per cent of 12-year-olds and 98 per cent of 14-year-olds use the internet at home or school, or somewhere else.

Compared with older age groups, eight-year-olds tend to be lower users of all technologies: 92 per cent of eight-year-olds use a computer, 68 per cent use the internet, 28 per cent use a mobile phone, 34 per cent use an MP3 player, and 22 per

¹ These two phases consisted of 124 interviews and 35 case studies with young people. Please see *Harnessing Technology: the Learner and their Context*, *Choosing to use technology: how learners construct their learning lives in their own contexts* (Davies and Good, 2009) for more details.

cent use a digital camera. However, the picture is different for computer and console games: 89 per cent of eight-year-olds play computer and console games.

Girls are more likely than boys to use mobile phones and digital cameras: 80 per cent of girls and 73 per cent of boys aged 8, 12, 14 and 17–19 use a mobile phone; 57 per cent of girls and 48 per cent of boys aged 8, 12, 14 and 17–19 use a digital camera.

Boys are more likely than girls to play computer and console games: 93 per cent of boys and 71 per cent of girls aged 8, 12, 14 and 17–19 play computer and console games.

Types of use: using computers and the internet

Young people use computers and the internet for communicating, information seeking, entertainment, creativity and participating: communicating tends to be the most popular activity; creativity and participation activities the least popular.

Older internet users tend to use computers and the internet more often for information seeking and communicating: compared with 12- and 14-year-olds, 17- to 19-year-old internet users use computers and the internet more often for communicating and information seeking.

Younger internet users tend to use computers and the internet more often for creative purposes: 12- and 14-year-old internet users use computers and the internet significantly more often for creative purposes than 17- to 19-year-old internet users do.

Female internet users aged 12, 14 and 17–19 tend to use the internet for communicating more often than males do.

Male internet users aged 12, 14 and 17–19 tend to use the internet for entertainment more often than females do.

Types of use: using the internet and computers for homework

Young people who are still at school use computers and the internet for producing homework, researching homework and using a virtual learning environment (VLE) or learning management system (LMS): researching homework was the most frequent activity and using a VLE or LMS the least frequent.

Internet users aged 17–19 who are still in education tend to be the most likely of the four age groups to use a VLE or LMS: 20 per cent of 8-year-old, 58 per cent of 12-year-old, 57 per cent of 14-year-old and 82 per cent of 17- to 19-year-old internet

users use a VLE or LMS to find resources and websites at least once every few months.

Multi-tasking while doing homework can be constructive or distractive: constructive multi-tasking is more common than distractive multi-tasking.

Older internet users engage in constructive multi-tasking more often than younger users do: 17- to 19-year-old and 14-year-old internet users constructively multi-task significantly more often when doing homework than internet users aged 8 or 12 do.

Compared with male internet users, female internet users are significantly less likely to engage in distractive multi-tasking while doing homework.

Types of use: playing games

Young people who play computer and console games tend to play two types of games: strategy and action games, and society and environment games.

Female and male game players aged 12, 14 and 17–19 tend to play different types of games: compared with female game players, male game players tend to play strategy and action games more often, and female game players tend to play society and environment games more often.

Eight-year-olds game players are less likely than older game players to play action and strategy games; for example, 54 per cent of 8-year-old, 67 per cent of 12-year-old, 65 per cent of 14-year-old and 74 per cent of 17- to 19-year-old game players play sports management games at least every few months.

Eight-year-olds are the most likely game players to play pet simulation games; 67 per cent of 8-year-old, 64 per cent of 12-year-old, 57 per cent of 14-year-old and 37 per cent of 17- to 19-year-old game players play pet-raising simulation games at least every few months. However, eight-year-olds are the least likely to play other games that fall into the society and environment game category (eg building and management games and social simulation games).

Types of use: using a mobile phone

Young people use mobile phones for three types of activities: texting and calling, multimedia, and accessing the internet. Texting and calling is the most frequent activity, and accessing the internet the least frequent.

Older mobile phone users are more likely than younger users to use their mobile phones for texting and calling and accessing the internet: 17- to 19-year-old mobile phone users use mobile phones for texting and calling significantly more often than those mobile phone users aged 12 or 14. Mobile phone users aged 17–19 use their

mobile phones to access email and the internet more frequently than mobile phone users aged 14 do.

Female mobile phone users tend to use a mobile phone for texting and calling more often than male mobile phone users do.

Compared with older mobile phone users, 8-year-old mobile phone users use their phones more for playing games: 86 per cent of 8-year-olds, 74 per cent of 12-year-olds, 68 per cent of 14-year-olds and 52 per cent of 17- to 19-year-old mobile phone users play games on their mobile phones at least every few months. Eight-year-olds are less likely than older age groups to use their mobile phones for any other multimedia activity.

Meeting people online

Over a quarter (27 per cent) of internet users aged 8, 12, 14 and 17–19 have got to know someone online whom they had not met in person. Internet users aged 17–19 were most likely to have got to know someone online, and 8-year-olds the least likely.

Social networking sites are the most popular location for 12-, 14- and 17- to 19-year-olds to get to know people online: 73 per cent of 12-year-olds, 91 per cent of 14-year-olds and 90 per cent of 17- to 19-year-olds who have got to know someone online met the person on a social networking site.

Of those who have met someone online whom they did not know in person, 28 per cent went on to meet the person face to face; 15 per cent of 8-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 got to know someone online whom they did not know before then met the person.

Safe use of technology

Young people are relatively careful about the information they give out online: internet users who communicate with people online whom they do not know in person are most likely to give out information about their interests and hobbies (78 per cent), their age (71 per cent) and email address (65 per cent), and least likely to give out information about their birthdays (29 per cent) or where they live (16 per cent). Of the 55 per cent of internet users 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 3 per cent do not know who can see their profiles.

A small proportion of young people have experienced cyber-bullying: 10 per cent of the respondents reported that they have either been sent or someone has posted an upsetting message about them or picture of them online or via mobile phone.

Those who have experienced cyber-bullying tend to tell someone about it. Although the numbers in each age group are small and so should be interpreted with caution, younger internet users tend to tell their parents, and older internet users tell their friends.

Getting a computer virus is the biggest safety concern for internet users: 48 per cent of 8-year-old, 63 per cent of 12-year-old, 61 per cent of 14-year-old and 64 per cent of 17- to 19-year-old internet users are at least a little concerned about getting a computer virus.

Female internet users tend to have greater concerns than male internet users about online safety.

Older internet users are more confident than younger internet users about keeping themselves safe on the internet: 25 per cent of 8-year-old, 49 per cent of 12-year-old, 48 per cent of 14-year-old and 58 per cent of 17- to 19-year-old internet users are very confident about keeping themselves safe on the internet. However, confidence is not the same as competence.

Most young people have support from teachers and parents in staying safe online: 80 per cent of internet users said their teacher explained how to stay safe on the internet, and 76 per cent of internet users said their parents or guardians taught them how to stay safe on the internet. In addition, young people are relatively self-reliant: seventy-one per cent of young people worked out by themselves how to stay safe on the internet.

Attitudes and perceived skills

Technological attitudes

Young people hold positive attitudes about technology; for example, 93 per cent agree or agree strongly with the statement 'you enjoy using technology', and 83 per cent with 'technology is important in your life'.

Boys and those who are older tend to be more positive about technology: 8-year-olds hold less positive attitudes towards technology than 12-, 14- and 17- to 19-year-olds do. Girls have significantly less positive attitudes than boys do about technology.

Young people see computers and the internet, books and magazines, and visual and auditory tools as important for learning. In general, computers and the internet are seen as the most important tools, and visual and auditory tools the least important.

Compared with boys, girls tend to see print media as more important for learning, and visual and auditory tools as less important for learning; girls are less positive

about the importance of visual and auditory technologies for learning than boys are, and tend to rate the importance to learning of print media more highly than boys do.

Older age groups see computers and the internet as more important than other tools for learning: 8-year-olds rate computers and the internet as less important for learning new things compared with 12-, 14- and 17- to 19-year-olds.

Perceived skills in using technology

Young people rate themselves quite highly in their ability to use a technology. Eight-year-olds tend to rate themselves less highly than other age groups do, particularly for computers, internet and mobile phone use, but rate themselves more highly than those aged 17–19 on using computer or console games.

Male internet users rate their ability to use the internet and find information online significantly higher than female internet users do.

Older internet users rate their ability to use the internet more highly than younger users do: 8-year-olds rate themselves as having the least internet ability and 17- to 19-year-olds the most. Twelve-year-olds rate their online-information-seeking ability significantly lower than those aged 17–19 do.

Boys and those belonging to the older age groups are the most likely to employ a problem-solving approach to technology: 8-year-olds are the least likely to apply a problem-solving approach to technology and 17- to 19-year-olds the most; boys are significantly more likely than girls to say they employ a problem-solving approach towards technology.

Attitudes and beliefs about learning

Twelve-, 14- and 17- to 19-year-olds tend to enjoy learning new things: 81 per cent agree or agree strongly with the statement 'you learn new things on your own just because you want to', 87 per cent with 'you enjoy learning new things', and 84 per cent with 'you like the opportunity to discover something new'.

Overall, young people are positive about their ability to do well at school. Seventeen- to 19-year-olds are more likely than 8-, 12- and 14-year-olds to believe they can do well at school, which probably reflect the difference between those in compulsory and post-compulsory education.

Quality of access to technology

A young person's home, another person's home, and school or college are the most popular places to access the internet. For example, when asked, 87 per cent of 8-year-olds, 87 per cent of 12-year-olds, 90 per cent of 14-year-olds and 94 per cent of

17- to 19-year-old internet users who were still in formal education said they had accessed the internet from school, college or university in the past month.

Young people are likely to have a number of different technologies in their homes: television (97 per cent of young people), DVD players (97 per cent) and radio (95 per cent) are the most popular, whereas camcorders (59 per cent) and webcams (49 per cent) are the least popular.

Eight-year-olds tend to have a lower number of technologies in the household than 12-, 14- and 17- to 19-year-olds do. Fourteen-year-olds have significantly higher number of technologies in the home than 17- to 19-year-olds do.

Eighty-seven per cent of young people have at least one computer at home; 42 per cent have one working computer, 26 per cent have two, 10 per cent have three, 4 per cent have four and 3 per cent have five or more working computers in the home.

Age is important in home access to computers: eight-year-olds are the most likely not to have a computer at home, and those from the younger age groups seem to need to negotiate access to a home computer more often. At least sometimes, most young people want to use a computer when someone else is using it: 86 per cent of 8-year-olds, 79 per cent of 12-year-olds, 74 per cent of 14-year-olds and 57 per cent of 17- to 19-year-old computer users sometimes want to use a computer that is already in use.

Most young people (82 per cent) have access to the internet at home; the vast majority (95 per cent) of those with access to a computer at home have internet access at home.

Those from older age groups are more likely than younger users to be able to go online in their bedrooms: 10 per cent of 8-year-olds, 37 per cent of 12-year-olds, 39 per cent of 14-year-olds and 63 per cent of 17- to 19-year-olds who have internet access at home can go online in their bedrooms.

Those from older age groups are more likely to have personal access to specific technologies: apart from gaming devices and consoles, those from the younger age groups are less likely than older users to own a particular technology; for example, 16 per cent of 8-year-olds, 37 per cent of 12-year-olds, 45 per cent of 14-year-olds and 55 per cent of 17- to 19-year-olds have access to their own computers.

Family, peer, school and work networks

Family

Parents tend to set rules about using technology, particularly for younger children. For example, 60 per cent of young people reported that their parents set rules at

least sometimes about how much time they spend on the phone, 74 per cent how much time they spend on the computer, 63 per cent the kinds of computer games they can play, 73 per cent the information they may give out online and 69 per cent set rules at least sometimes about communicating with people online. Younger age groups were significantly more likely than older age groups to report their parents regulate their use of technology.

Parents tend to support their children's use of the internet, particularly for younger children: 65 per cent of young people who still lived with their parents stated that their parents sit with them and use the computer or laptop at least sometimes, 59 per cent reported that their parents suggest, at least sometimes, interesting websites for them to visit, and 67 per cent stated their parents help them at least sometimes on the computer or laptop.

Peers

Young people tend to see their friends as engaged with technology: 94 per cent agree or agree strongly with the statement 'your friends like to use technology', 74 per cent with 'you talk about technology with your friends', and 82 per cent with 'you use technology with your friends'.

Eight-year-olds are less likely than 12-, 14- and 17- to 19-year-olds to rate their friends as engaging highly with technology.

In general, boys are more likely than girls to rate their friends as engaging highly with technology. However, in contrast to the other three age groups, 14-year-old girls rate their friends as being engaged in technology as much as boys do.

Formal education

Overall, young people are relatively positive about their schools' provision and use of technology: 86 per cent agree or agree strongly with the statement 'the technology in your school, college or university is very good', 71 per cent with 'you have lots of opportunity to use technology during lessons or lectures', and 65 per cent with 'you have lots of opportunity to use technology outside lessons or lectures'.

However, young people tend to use technology more at home: 73 per cent agree or agree strongly with the statement 'you use more technology at home than you do at school, college or university'.

Those who are older tend to rate school or college provision of technology more highly than younger age groups do: 8-year-olds rate the amount of technology used in school the lowest and 17- to 19-year-olds the highest of the four age groups.

Work

The workplace tends not to be a place where young people can develop their technical skills and experience. Of those in the 17- to 19-year-old age group that worked, 67 per cent did not use computers and the internet in their jobs and fewer than 20 per cent had the opportunity to learn new computer skills at work.

Digital divides among young people

Use and non-use of technologies is not explained only by socio-economic and demographic factors; attitudes towards technologies and friends' engagement with technologies are also important.

There are a range of reasons for use and non-use of different technologies. For example, boys, those who are younger, young people who have friends who are more engaged in technology, and young people who have a greater range of technologies in their homes are more likely to play computer and console games. In contrast, those who are older (particularly 14 and above), who have more technologies in their homes, who have friends who engage with technology, who are female, and live in less deprived areas are more likely to use digital cameras.

The importance of different factors in understanding use of technology

Types of computer and internet use

Having personal access to a computer is important: internet users aged 12, 14 and 17–19 who have personal access to a computer use the internet significantly more often for communicating, information seeking, entertainment, creativity and participating.

Having confidence in using technology affects how young people use the internet. Internet users aged 12, 14 and 17–19 who employ a problem-solving approach to technology tend to use the internet significantly more often for communicating, information seeking, entertainment, creativity and participating. Internet users aged 12, 14 and 17–19 who rate highly their ability to use the internet tend to use the internet significantly more often for communicating, information seeking, entertainment and participating.

Internet users aged 12, 14 and 17–19 who have friends who are engaged in technology tend to use the internet more often for communicating, information seeking, entertainment and participating.

Parental involvement can be positive or negative: internet users who perceive their parents as supportive tend to use the internet more often for creativity, and those

internet users who perceive themselves to be highly regulated and have parents who are not supportive are more likely to participate online.

Internet use does not necessarily equate to learning: internet users aged 12, 14 and 17–19 who enjoy learning tend to do more information seeking, but those who say they do not enjoy learning tend to engage more in entertainment and communicating activities online.

Use of computers and the internet for homework

Attitudes to technology are important in understanding young people's use of computers and the internet for homework: internet users aged 12, 14 and 17–19 who are still in formal education who believe they can do well at school or college and/or who employ a problem-solving approach to technology tend to use computers and the internet more often for producing and researching homework.

The quality of home access is important. For example, internet users aged 12, 14 and 17–19 who are still in formal education and have internet access at home are significantly more likely to use computers and the internet more often for researching homework.

Having friends who are engaged in technology is also important in understanding the use of computers and the internet for homework. Internet users aged 12, 14 and 17–19 who are still in formal education and who have friends who are more engaged in technology are significantly more likely to use the computers and the internet more often for researching homework and using a VLE.

Parental involvement is important to some extent in understanding young people's use of computers and the internet for homework. Internet users aged 12, 14 and 17–19 who are still in formal education who perceive their parents to be supportive and whose parents regulate their technology use more frequently tend to use computers and the internet more often for researching homework.

School use of technology is important in understanding who uses a VLE. Internet users aged 12, 14 and 17–19 who are still in formal education and who rate the technology provision in their schools more highly tend to use a VLE more often.

Playing games

Skills are important in understanding types of games played. Game players aged 12, 14 and 17–19 who rate more highly their ability to play games were significantly more likely to play strategy and action games and society and environment games more often.

Parents tend to regulate the activities of game players. Game players aged 12, 14 and 17–19 who have parents who frequently regulate their use of technologies tend to play strategy and action games and society and environment games more often.

Using a mobile phone

Confidence is important in understanding mobile phone use. Mobile phone users aged 12, 14 and 17–19 who tend to rate highly their ability to use a mobile phone are more likely to use their mobile phones more often for traditional and multimedia uses.

Mobile phone users aged 12, 14 and 17–19 who employ a problem-solving approach to technology are also more likely to use their mobile phones more often for traditional (ie texting and calling) and multimedia purposes.

Implications for the Harnessing Technology strategy

Engaged and empowered learners

Access to technologies at home is higher for young people compared to the average for the UK population, yet is by no means universal. Having home access has implications for how young people engage with technology.

It is important to consider the quality of home access. As computers and the internet become a more typical feature of households, the quality of the access that young people have to these technologies in their homes (eg whether they have personal access, and the amount of negotiation required to gain access) becomes increasingly important.

Because technologies evolve, ensuring that learner entitlement is met and that all groups are supported with respect to access to technologies is a constantly shifting target.

The role of parents and friends is an important aspect of understanding the potential of technology to support family and informal learning. As children get older their friends become increasingly important.

Parental support is a complex issue: while it is clear that the role of parents is important in some respects, there needs to be more work to fully understand the parents' role within the context of family and informal learning.

Attitudes towards technology and learning are important: in general, young people tend to have positive attitudes about technology, view certain technologies as valuable for learning, are often positive about learning new things and tend to believe in their ability to do well at school, college or university. While these attitudes are not

about confidence *per se*, they are significant because they have an important part to play in understanding whether a young person uses a particular technology and they influence the kinds of technological activities that young people undertake.

Young people's confidence in their skills is generally high; this is a very positive finding because confidence is related to the frequency with which young people undertake certain activities. For example, game players aged 12, 14 and 17–19 who rate more highly their ability to play games tend to play strategy and action games and society and environment games more often. Yet, it is important to note that confidence is not the same as competence, and thus young people may still need support in developing their skills.

Being able to take a problem-solving approach to technology is a particularly valuable skill and is a significant factor in the uptake of a range of different uses of technology. For example, internet users aged 12, 14 and 17–19 who employ a problem-solving approach to technology tend to use the internet significantly more often for communicating, information seeking, entertainment, creativity and participating.

Young people appear to be relatively safe users of the internet: they seem to be relatively careful about the information they give out online and are relatively confident about keeping themselves safe online (this is particularly so for older age groups). While young people often work out how to stay safe on the internet by themselves, teachers and parents are also important sources of support, particularly because confidence does not necessarily equate to competence.

Improved personalised learning experiences

There are a wide variety of technological activities that young people can engage with that could lead to improved personalised learning experiences. For example, young people use computers and the internet for communicating, information seeking, entertainment, creativity and participating, producing homework, researching homework, using a VLE or LMS, and meeting people online.

There tend to be significant differences in the use of technology by young people, particularly relating to their age and gender. Such diversity needs to be understood and supported in order to facilitate learning via technologies.

Enabling infrastructure and processes

School, which is a significant source of access to computers and the internet, is important for supporting young people. However, although more analysis is required, it is unlikely that school access is sufficient for those who do not have home access. Young people tend to use more technology at home than they do at school, and

home access is important for enhancing the frequency with which young people carry out certain activities on computers, games consoles and mobile phones.

Conclusions and recommendations

- Young people are relatively high users of technology and use technologies for a wide range of activities. However, it is important to recognise the diversity among young people in their uses of technology.
- The factors that help to explain whether a young person engages in a particular type of technological activity are different for different technologies and different groups. Thus, different strategies are likely to be required to support specific kinds of technology use.
- Ensuring that all young people are supported in terms of access to technologies is a constantly shifting target.
- Generally, young people are confident users of technology. However, confidence is not the same as competence. Young people should be supported by parents and teachers in appropriate ways.
- Attitudes towards technology and learning are important. Attitudes tend to play a part in understanding whether a young person uses a particular technology, and the frequency with which young people undertake particular technological activities.
- The role of parents and guardians is important in some, but not all, respects. Initial findings show that parents' views of the value of technology may be important in facilitating home access to technologies, and that parents try to both support and regulate their children's technology use in the home. However, more research is required to explore the multi-faceted interactions between parents, young people and technology in the home.
- The role of friends is important, particularly as children move towards adolescence. Young people who have friends who engage with technology tend more frequently to carry out a range of activities with technology.
- To a certain extent, school is important for supporting young people in their use of technologies. In general, school provides access to technology and support in developing skills (such as keeping safe online). However, young people who are able to use technology at home tend to use technology more often and carry out some activities more often.

Introduction

This report presents findings from the third phase of data gathering during the initial year of the Learner and their Context research project, being carried out at the Oxford University Department of Education in association with Becta.

The aim of the research is to gain up-to-date understandings about how a wide range of learners experience new technologies in their lives outside formal education, and the learning made possible by those experiences. The research supports the Government's Harnessing Technology strategy.

This third phase of data gathering consisted of a survey of 1,069 young people who are representative of young people aged 8, 12, 14 and 17–19 in the UK.

Aims

The purposes of the survey were to:

- understand the use and non-use of a range of different technologies by young people in their lives outside formal education
- provide a representative overview of young people's uses of technologies that complements the other two qualitative phases of data gathering for this project.

The focus of the survey was to understand the use and non-use of a range of technologies and the individual and contextual factors that may help to explain this. In particular, age, gender, attitudes, skills, quality of access to technology, and family, peer, school and work contexts were explored.

Sample

The sample was identified using output areas, each comprising around 150 households, which were randomly drawn using the ACORN classification. In each output area, the interviewer was asked to find one 8-year-old, 12-year-old, 14-year-old and 17- to 19-year-old to interview, knocking on every third door. The interviewer could interview only one young person per household. Among the total of 1,069 respondents, there were 265 8-year-olds, 265 12-year-olds, 275 14-year-olds and 264 17- to 19-year-olds. The group provides a representative sample of 8, 12, 14 and 17- to 19-year-olds in the UK.

Methodology

All the young people included in the survey were interviewed at home by a researcher from ICM. Parents were welcome to be present during the discussion,

and in 56 per cent of cases a parent or other person sat in on the entire interview. The interview took between 20 and 40 minutes depending on the age of the child.

The interview questions focused on: use and non-use of technologies; the young people's attitudes and skills; the quality of access to technology; family, peer, school and work contexts; and demographic and socio-economic variables. A set of core questions was asked across all age groups, with some simplified questions for 8-year-olds and some additional questions about work and educational achievement for 17- to 19-year-olds.

The data-collection phase took place across England, Scotland, Wales and Northern Ireland from 19 December 2008 to 1 February 2009.

Analytical strategies

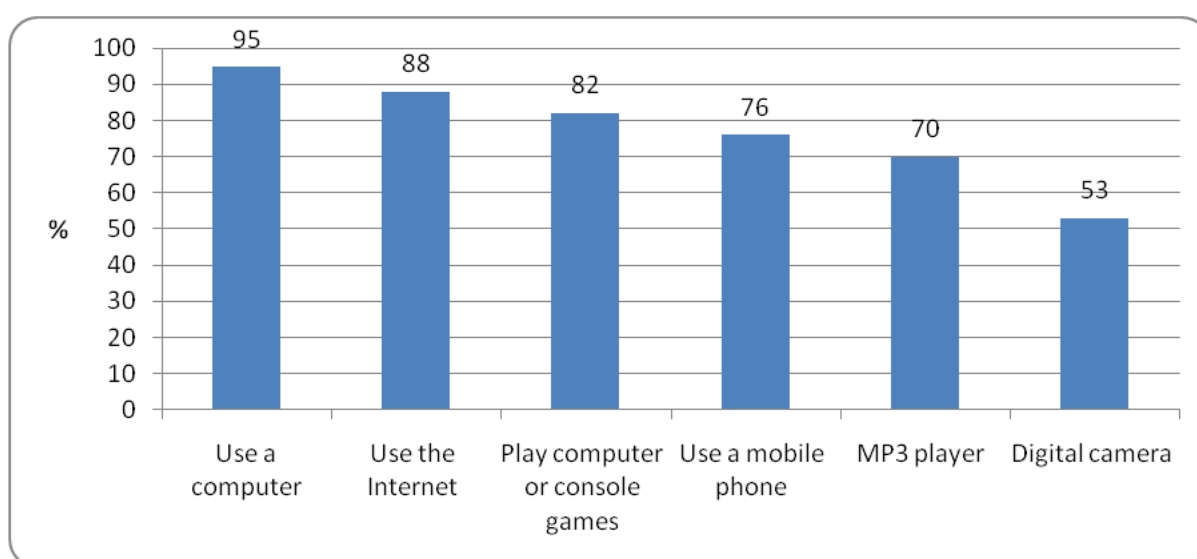
Descriptive and inferential statistical analysis of the data was conducted primarily using the statistics package SPSS. A full explanation of the analytical strategies employed in the survey is provided in the technical appendix. In summary, bivariate analysis, factor analysis, analysis of variance (ANOVA), and logistic and linear regression were utilised to explore the effects of age, gender, attitudes, skills and contextual factors on young people's uses of technology.

A particular strength of the design of the survey is that we can make distinctions between the activities, attitudes, skills and contexts of 8-, 12-, 14- and 17- to 19-year-olds in the UK. However, as a consequence, it is important to note that the analyses were carried out as a comparison of age groups, and thus we cannot draw conclusions about individual developmental trajectories.

Uses of technology by young people

Use and non-use of technologies

Young people tend to be relatively high users of technology. From the survey, 95 per cent of young people aged 8, 12, 14 and 17–19 use a computer, 88 per cent use the internet, 82 per cent play computer or console games, 76 per cent use a mobile phone, 70 per cent use an MP3 player, and 53 per cent use a digital camera – whether at home, school or somewhere else (Figure 1).

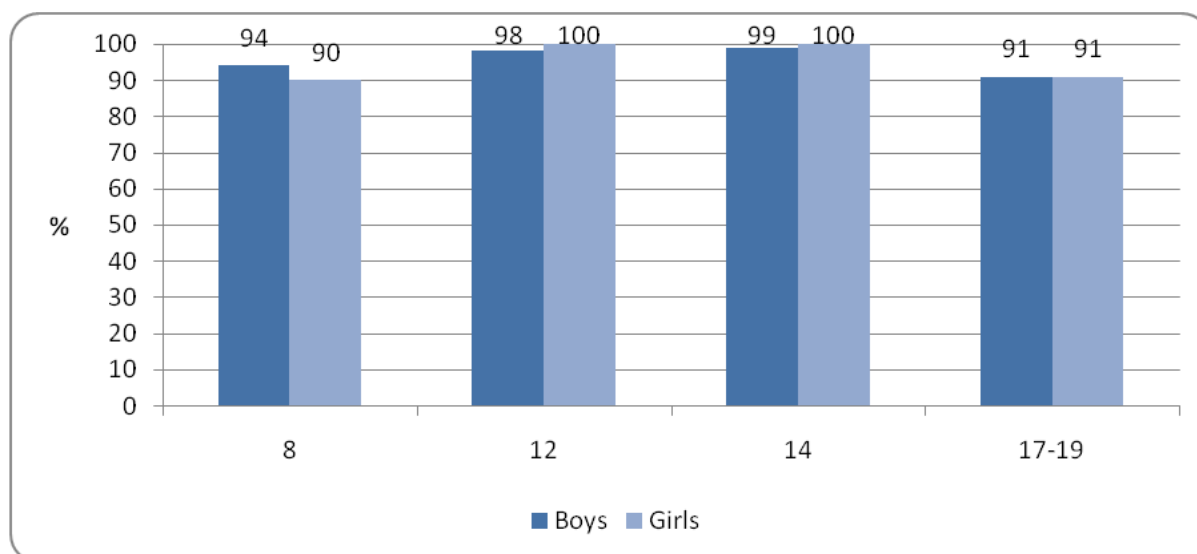


N=1,069 (all participants).

Figure 1: Use of technology (% of respondents)

At age 12 and 14, the use of a computer is almost universal, with 99 per cent in each age group using a computer at home, school or somewhere else. Eight- and 17- to 19-year-olds are slightly less likely to use a computer, with 92 per cent and 91 per cent respectively reporting that they do so.

Gender is not significant in understanding the use and non-use of computers (Figure 2).

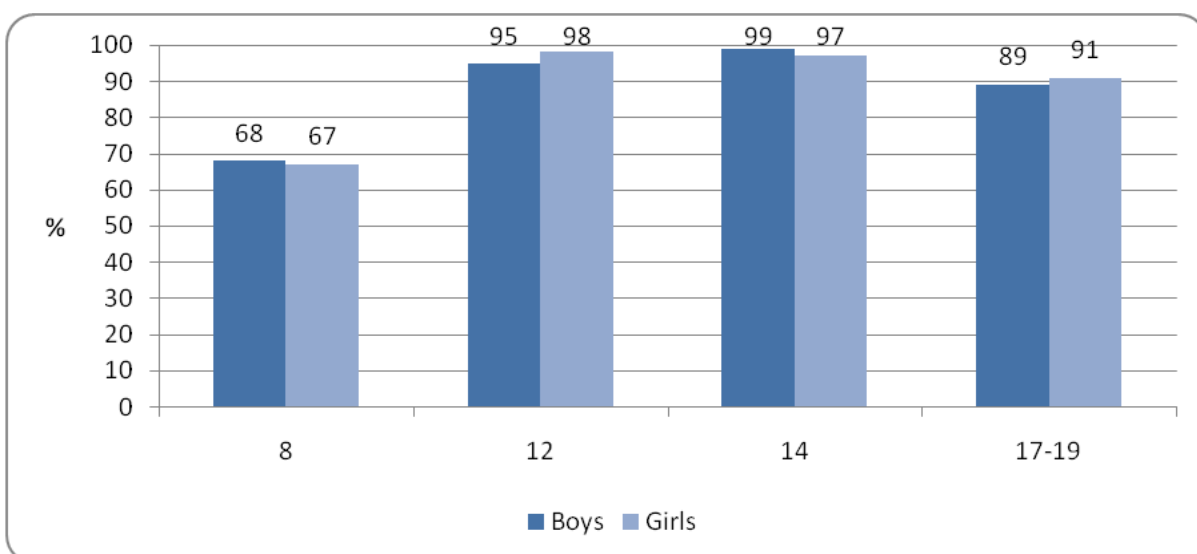


N=1,069 (all participants).

Figure 2: Use of computers by age and gender (% of respondents)

Among the three oldest age groups, use of the internet has a similar pattern to computer use, with 97 per cent of 12-year-olds, 98 per cent of 14-year-olds and 90 per cent of 17- to 19-year-olds using the internet at home or school or in some other location. The proportion of eight-year-olds using the internet is significantly lower, with 68 per cent reporting that they use the internet.

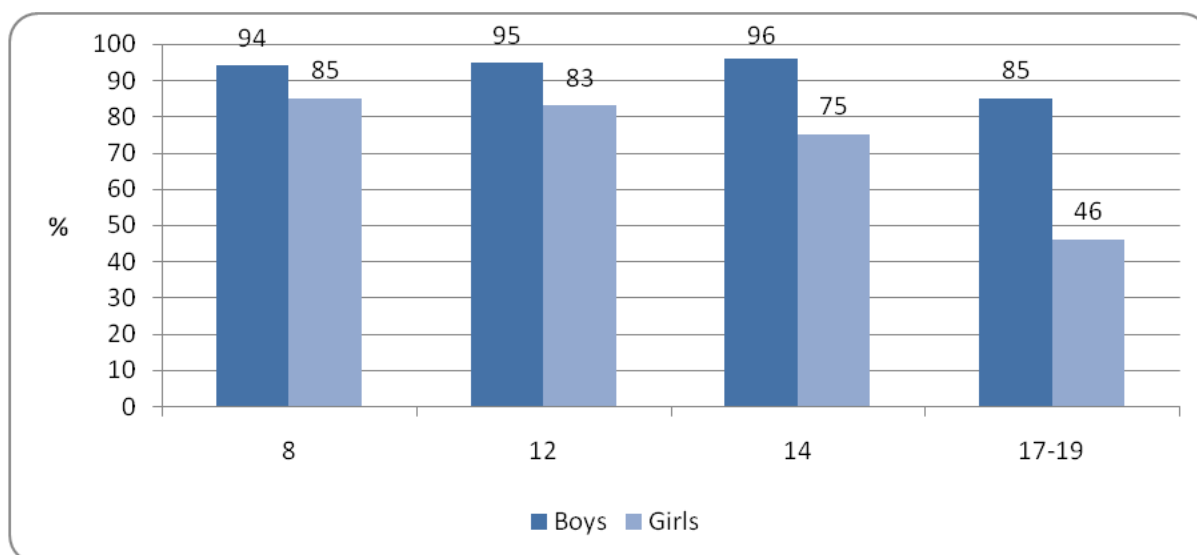
Similar to computer use, there are no significant differences between boys' and girls' use of the internet at any age (Figure 3).



N=1,069 (all participants).

Figure 3: Use of the internet by age and gender (% of respondents)

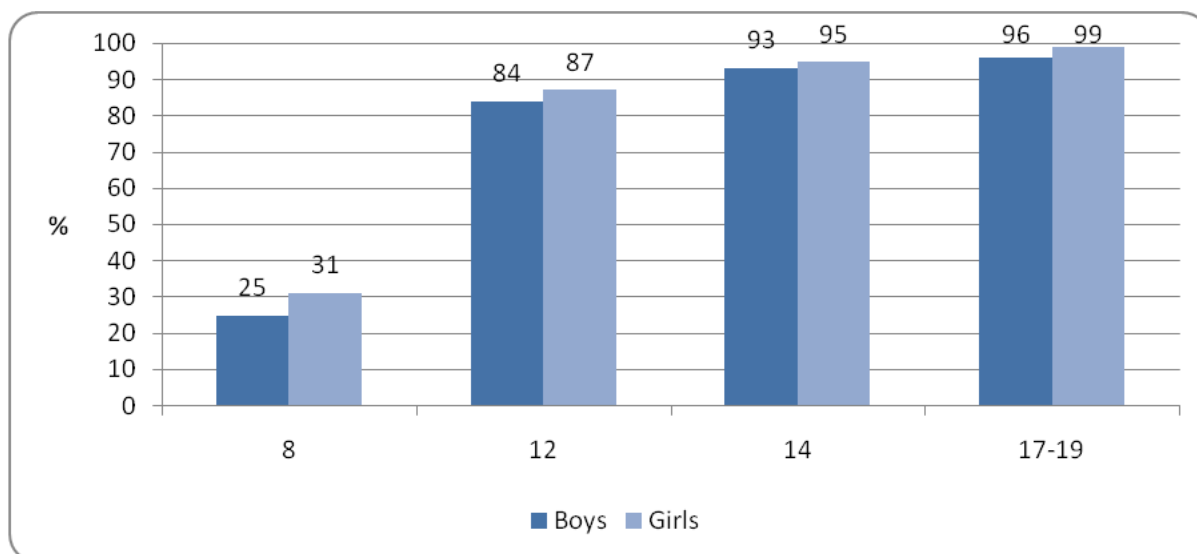
As shown in Figure 4, 17- to 19-year-olds are the least likely to play computer and console games. Also, significantly more boys than girls in each age group play computer games. For example, 94 per cent of 8-year-old boys and 85 per cent of 8-year-old girls play computer and console games, compared with 85 per cent of boys and 46 per cent of girls aged 17–19.



N=1,069 (all participants).

Figure 4: Use of computer and console games by age and gender (% of respondents)

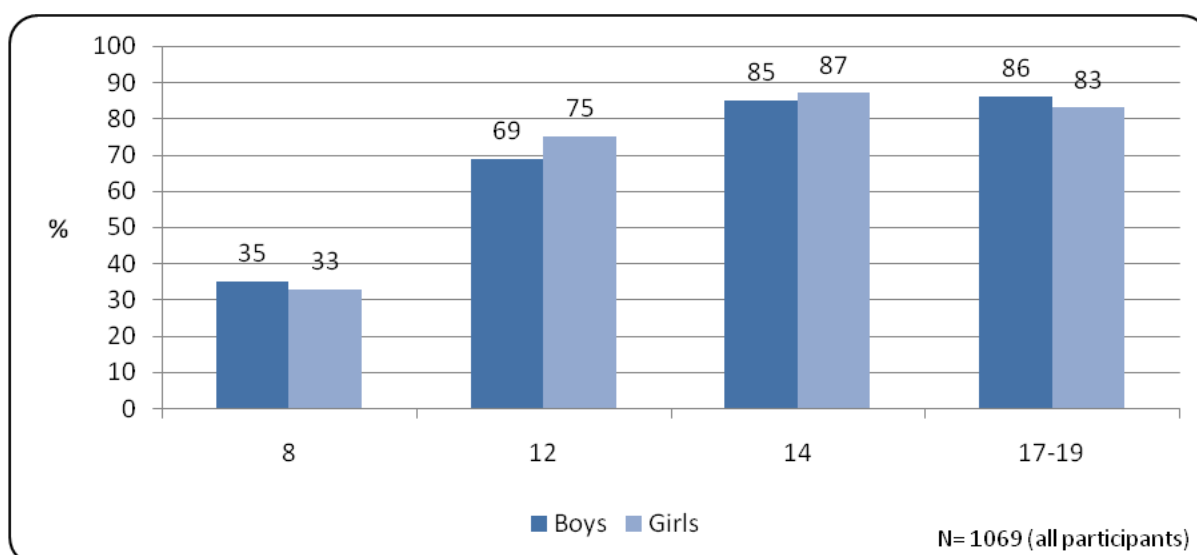
Eight-year olds are significantly less likely to use mobile phones compared with the older age groups, and girls are more likely than boys to be mobile phone users. For example, 25 per cent of boys and 31 per cent of girls aged 8 use a mobile phone, compared with 96 per cent of boys and 99 per cent of girls aged 17–19 (Figure 5).



N=1,069 (all participants).

Figure 5: Use of mobile phones by age and gender (% of respondents)

A higher proportion of 14 and 17- to 19-year-olds compared with 12 and, particularly, 8-year-olds use MP3 players (Figure 6). Thirty-four per cent of 8-year-olds, 72 per cent of 12-year-olds, 86 per cent of 14-year-olds and 85 per cent of 17- to 19-year-olds use an MP3 player.



N= 1069 (all participants)

Figure 6: Use of MP3 players by age and gender (% of respondents)

A higher proportion of 14 and 17- to 19-year-olds compared with 12 and, particularly, 8-year-olds use digital cameras. Twelve-, 14- and 17- to 19-year-old girls are more likely than boys of the same age to use digital cameras. For example, 71 per cent of girls and 60 per cent of boys aged 14, and 73 per cent of girls and 62 per cent of

boys aged 17–19 use a digital camera (Figure 7). It is important to note that 87 per cent of mobile phone users take photos on their mobile phones (see the section on mobile phone use below).

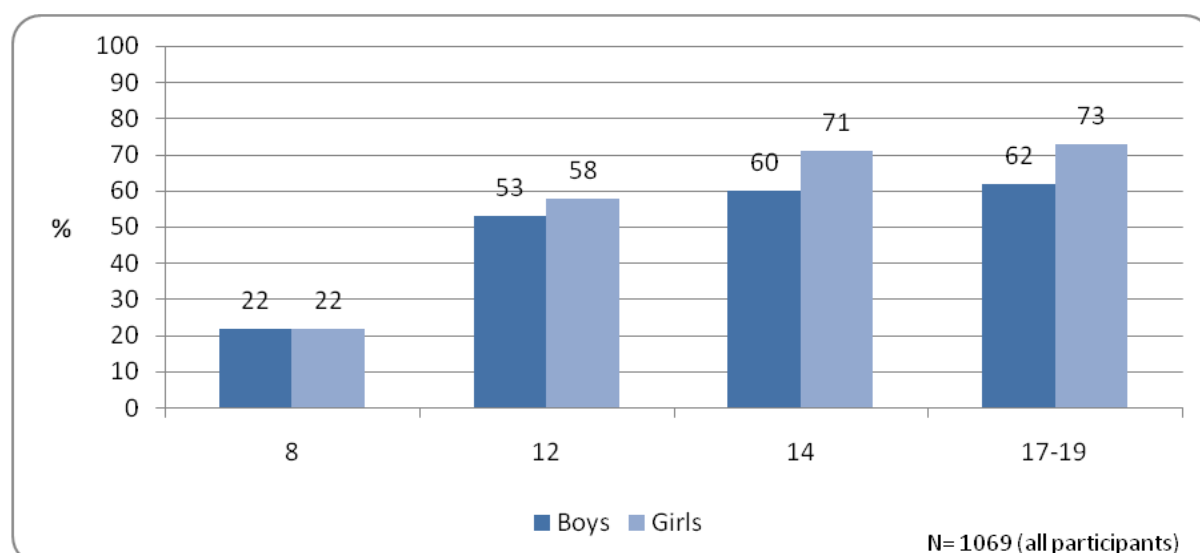


Figure 7: Use of digital cameras by age and gender (% of respondents)

Types of use of technology

Survey participants were asked a range of questions about what activities they carry out using computers, the internet, mobile phones and games devices outside school, college or university lessons, and how often they perform certain activities.² Using factor analysis, a number of different types of activities were identified; the results are summarised in three main sections below.

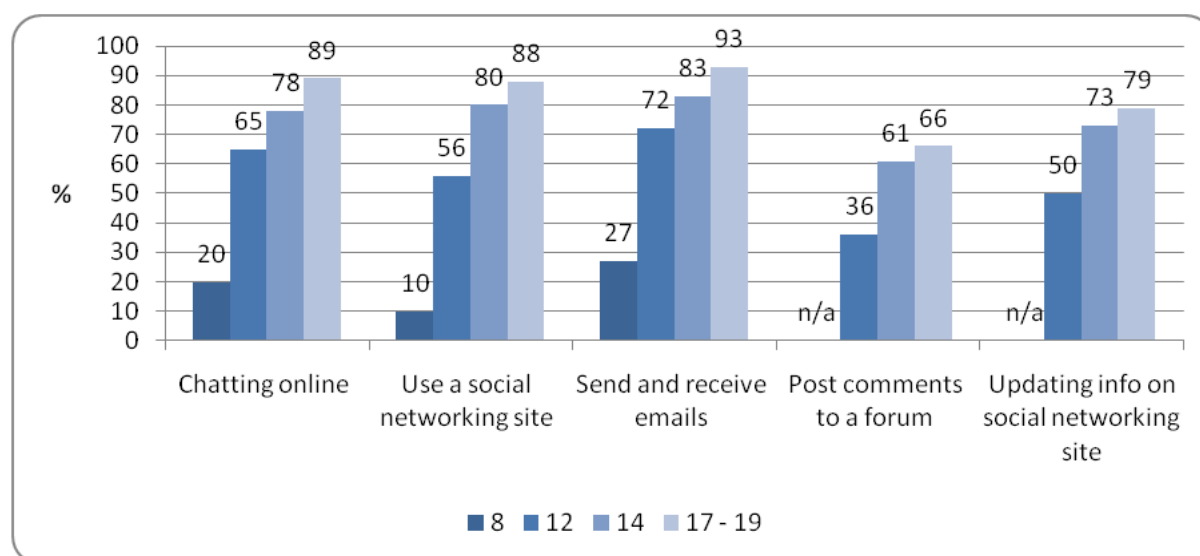
Using the internet and computers

From the factor analysis, five main types of internet and computer use were identified: communicating, information seeking, entertainment, participating and creativity.

The first factor, communicating, contains five activities associated with using the internet to communicate: chatting online; using a social networking site; sending and receiving emails; putting photos on the internet; and posting comments or messages to a forum or updating information on a social networking site.

² Note that the number and nature of the questions were different for 8-year-olds compared with the other ages. Eight-year-olds were asked fewer questions; also the questions required yes/no answers, whereas other participants were asked how often they carry out particular tasks.

Figure 8 summarises the percentage of internet users in each age group who reported carrying out each of the communicative activities at least once every few months. Online communication activities tend to be a relatively popular activity relative to the other four types of internet use. For each item, 8-year-old internet users are the least likely to undertake a communicative activity and 17- to 19-year-olds the most likely. For example, 20 per cent of 8-year-olds, 65 per cent of 12-year-olds, 78 per cent of 14-year-olds and 89 per cent of 17- to 19-year-olds who use the internet chat online at least once every few months.



N=943 (internet users only).

Figure 8: Communicating by age (% of respondents who carry out this activity every few months)

The means of the 'communicating' activities were combined to create a single factor. ANOVA was used to explore the effects of age and gender on the use of the internet for communicating for the three oldest age groups.³ It is important to note, that in the original items, participants were asked how frequently they carry out specific activities on a scale (0 = never, 1 = every few months, 2 = monthly, 3 = weekly, 4 = daily and 5 = a few times a day). The scale on the vertical axis in Figure 9 is based on the construct that was developed from these original items, and thus gives an indication of the frequency of the use of the internet for communicating.

³ This analysis was not possible for the 8-year-old age group because of the dichotomous nature of the questions and the more limited number of questions about use that were included in the 8-year-olds' survey.

There is a significant relationship between age and the use of the internet for communicating by internet users: 17- to 19-year-old internet users use the internet the most often for communicating, and 12-year-old internet users the least often (Figure 9). Overall, female internet users are more frequent users of the internet for communicating than male internet users are. There is no significant interaction effect between the age of internet users and their gender on the use of the internet for communicating.

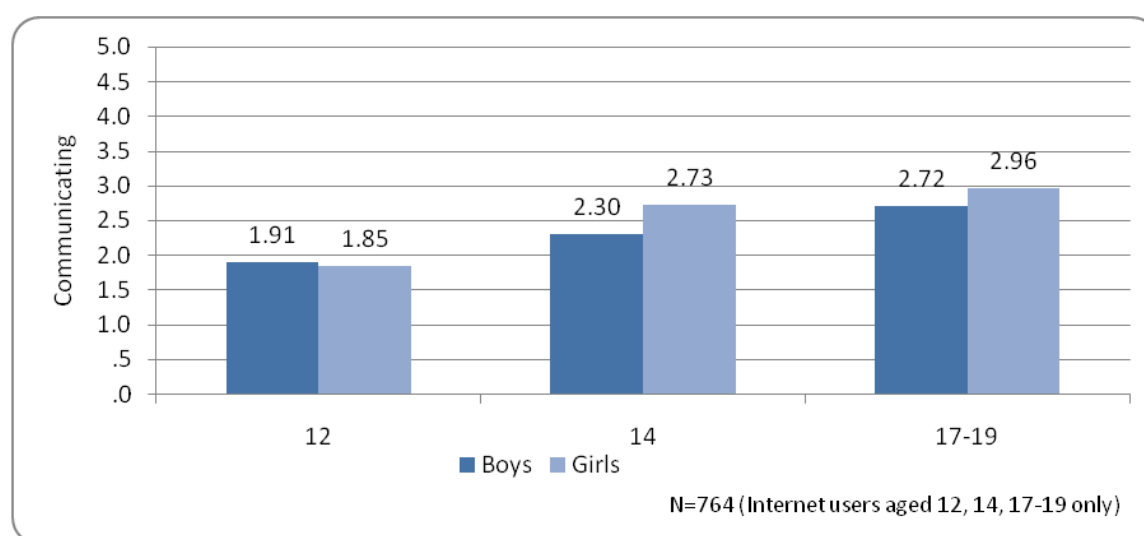


Figure 9: Communicating by age and gender⁴

The second type of use of the internet identified by the factor analysis was information seeking. The five individual 'information seeking' items were: using a computer and the internet to look for information on a topic that interests you; research products you would like to buy or own; keep up with the news; look for information on careers; and buy products online.

⁴ This construct was developed from individual items where participants were asked how frequently they carry out specific activities on a scale (0 = never, 1 = every few months, 2 = monthly, 3 = weekly, 4 = daily and 5 = a few times a day). Thus the scale on the vertical axis gives an indication of the frequency of using the internet for communicating.

The percentage of each age group who carried out each kind of information-seeking activity at least once every few months is summarised in Figure 10. As with communicating activities, age is important: 8-year-old internet users are the least likely to undertake an information-seeking activity, and 17- to 19-year-old internet users the most likely. For example, 63 per cent of 8-year-olds, 80 per cent of 12-year-olds, 85 per cent of 14-year-olds and 88 per cent of 17- to 19-year-old internet users look for information on a topic that interests them at least once every few months.

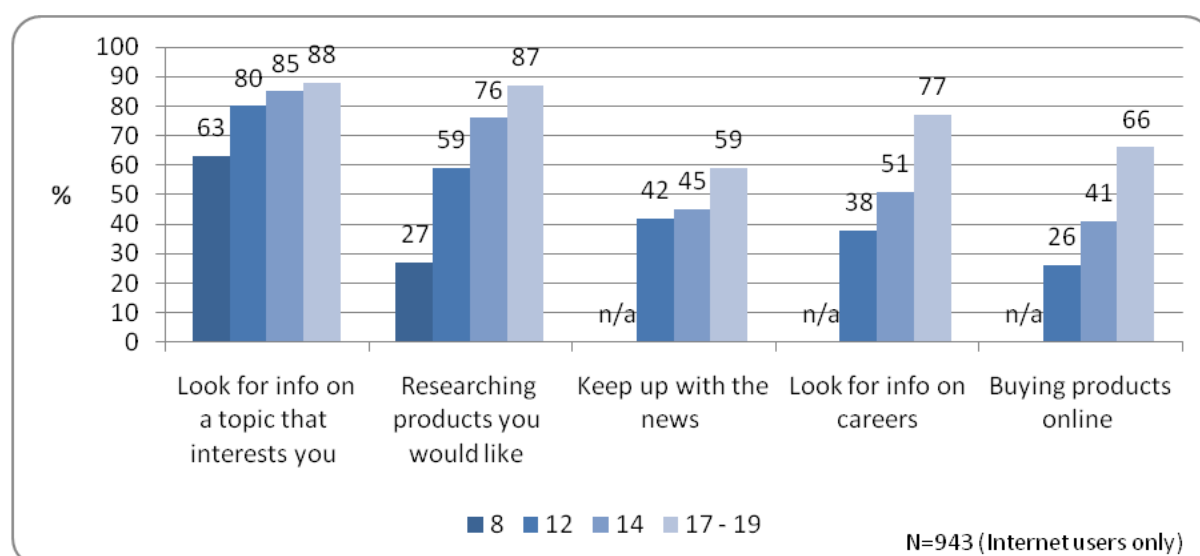


Figure 10: Information seeking by age (% of respondents who carry out this activity every few months)

The means of the 'information seeking' items were combined to create a single factor.

ANOVA was used to explore the effects of age and gender of internet users on the use of the internet for information seeking for the three oldest age groups (Figure 11). There is a significant effect of age on the use of the internet for information seeking: 17- to 19-year-old internet users engage in information seeking online the most often, and 12-year-old internet users the least often. There is a significant interaction effect between the age of young people and their gender on the use of the internet for information seeking. At 12, female internet users are less frequent users of the internet for information seeking than boys are; at 14, girls are more frequent users than boys are, and, at 17–19, girls are again less frequent users than boys are of the internet for information seeking.

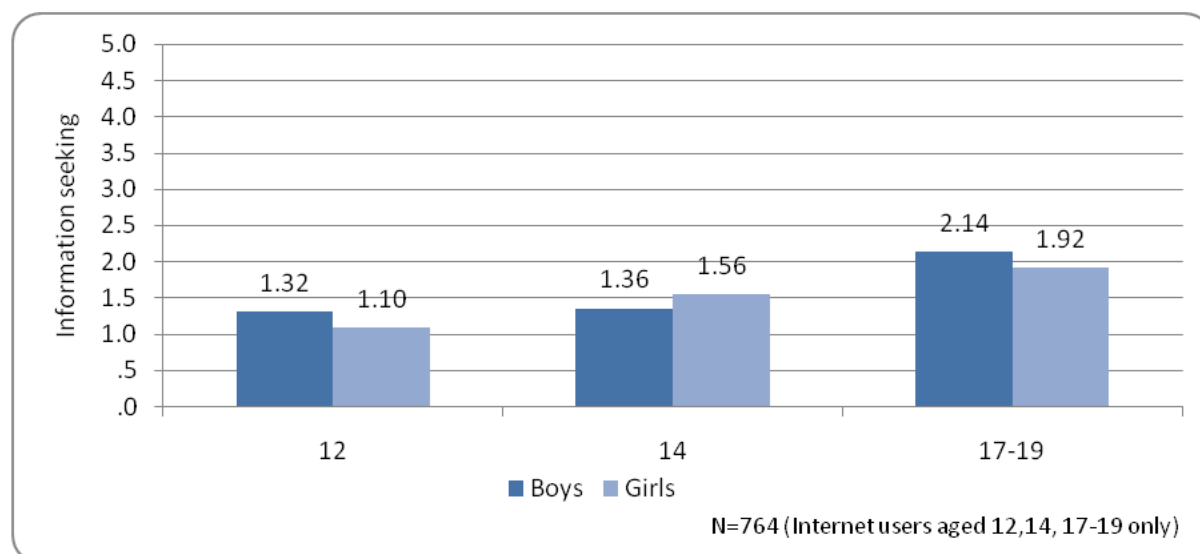


Figure 11: Information seeking by age and gender⁵

The third factor identified by the factor analysis was entertainment. This factor consisted of three ways to use the internet for entertainment: watching TV on demand on a computer; watching videos on a computer; and downloading music (for 8-year-olds) or downloading or streaming music (for 12, 14 and 17- to 19-year-olds).

The percentage of internet users in each age group who reported carrying out each kind of entertainment activity at least once every few months is summarised in Figure 12. Age group is again important: 8-year-old internet users are the least likely to undertake an entertainment activity, and 17- to 19-year-olds the most likely. For example, 40 per cent of 8-year-old, 69 per cent of 12-year-old, 81 per cent of 14-year-old and 82 per cent of 17- to 19-year-old internet users watch videos on a computer at least once every few months.

⁵ This construct was developed from individual items where participants were asked how frequently they carry out specific activities on a scale (0 = never, 1 = every few months, 2 = monthly, 3 = weekly, 4 = daily and 5 = a few times a day). Thus the scale on the vertical axis gives an indication of the frequency of using the internet for information seeking.

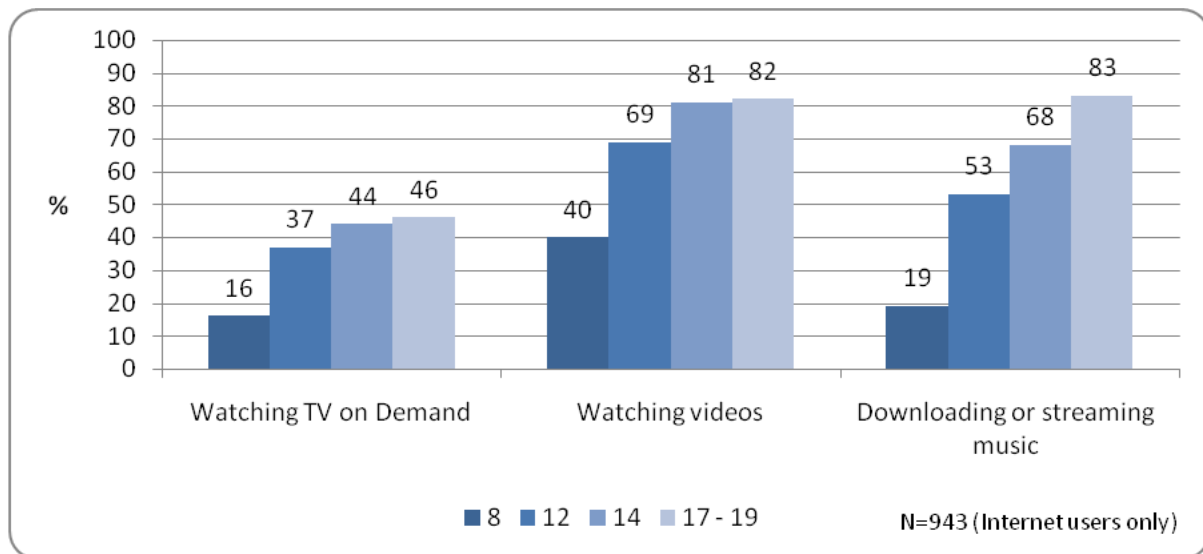


Figure 12: Entertainment by age (% of respondents who carry out this activity every few months)

The means of the 'entertainment' items were combined to create a single factor.

ANOVA was used to explore the effects of age and gender of internet users on the use of the internet and computers for entertainment for the three oldest age groups (Figure 13). There is a significant effect of age on the use of the internet for entertainment: internet users aged 17–19 and 14 use computers and the internet for entertainment significantly more often than 12-year-olds do. Overall, boys use the internet for entertainment more often than girls do. There is no significant interaction effect between the age of internet users and their gender on the use of the internet for entertainment.

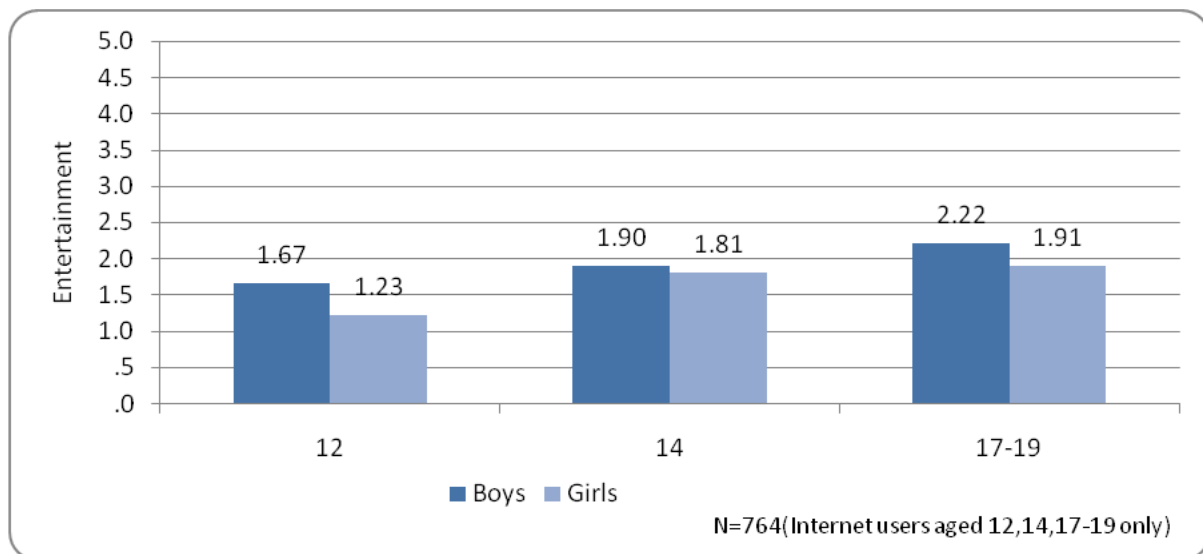


Figure 13: Entertainment by age and gender⁶

The fourth factor, creativity, covered four items that measured more creative uses of computers: creative writing; writing or composing music or lyrics; creative drawing; and improving or editing photos.

The percentage of internet users in each age group who reported carrying out each kind of creative activity at least once every few months is summarised in Figure 14. Activities related to creativity tend not to be as popular as those related to communication, information seeking and entertainment. For three of the four activities, the pattern of use follows an inverted U shape, with 12-year-olds the most likely to undertake some kind of creative activity using the internet. For example, 38 per cent of 8-year-old, 56 per cent of 12-year-old, 48 per cent of 14-year-old and 30 per cent of 17- to 19-year-old internet users use the computer and internet for creative writing at least once every few months.

⁶ This construct was developed from individual items where participants were asked how frequently they carry out specific activities on a scale (0 = never, 1 = every few months, 2 = monthly, 3 = weekly, 4 = daily and 5 = a few times a day). Thus the scale on the vertical axis gives an indication of the frequency of use of the internet for entertainment.

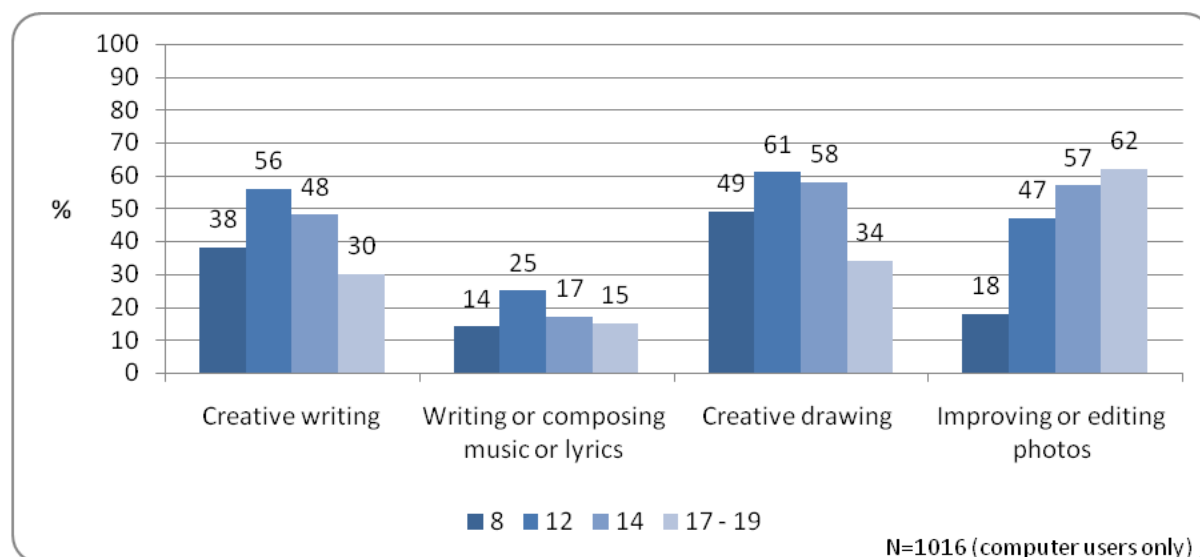


Figure 14: Creativity by age (% of respondents who carry out this activity every few months)

The means of the 'creativity' items were combined to create a single factor..

ANOVA was used to explore the effects of age and gender of internet users on the use of computers and the internet for creativity for the three oldest age groups (Figure 15). There is a significant main effect of age on the use of the internet for creative purposes: 12- and 14-year-old internet users use computers and the internet significantly more often for creative purposes than do 17- to 19-year-old internet users. There are no overall significant differences between boys' and girls' use of the internet for creative purposes, and no significant interaction effect between the age of internet users and their gender on the use of the internet for creative purposes.

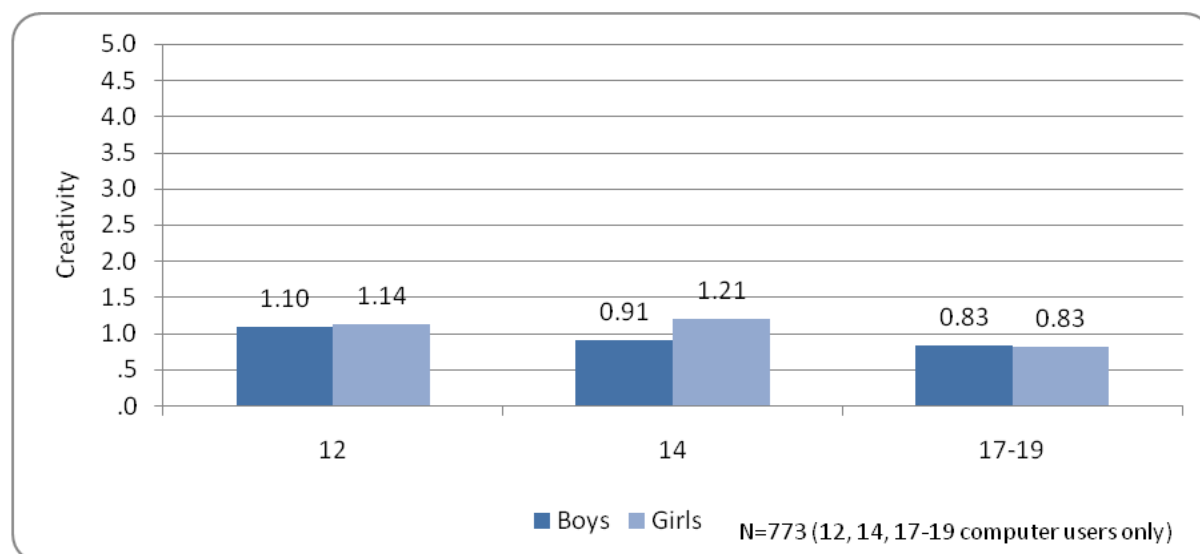


Figure 15: Creativity by age and gender⁷

The fifth factor, participating, covered aspects of internet and computer use that signify participatory uses of computers and the internet. The four individual items were: writing your own blog; adding or changing content in a wiki; putting podcasts, music or videos on the internet; and reading a blog.

The percentage of internet users in each age group who reported carrying out each kind of participative activity at least once every few months is summarised in Figure 16. The most popular activity is a fairly passive one – reading a blog – and the other three activities are less popular than those activities categorised as entertainment, information seeking and communicating. Seventeen- to 19-year-olds and 14-year-olds tend to be more likely than 12-year-olds to undertake participative activities online. For example, 28 per cent of 12-year-olds, 44 per cent of 14-year-olds and 44 per cent of 17- to 19-year-olds write their own blogs at least once every few months.

⁷ This construct was developed from individual items where participants were asked how frequently they carry out specific activities on a scale (0 = never, 1 = every few months, 2 = monthly, 3 = weekly, 4 = daily and 5 = a few times a day). Thus the scale on the vertical axis gives an indication of the frequency of the use of the internet for creativity.

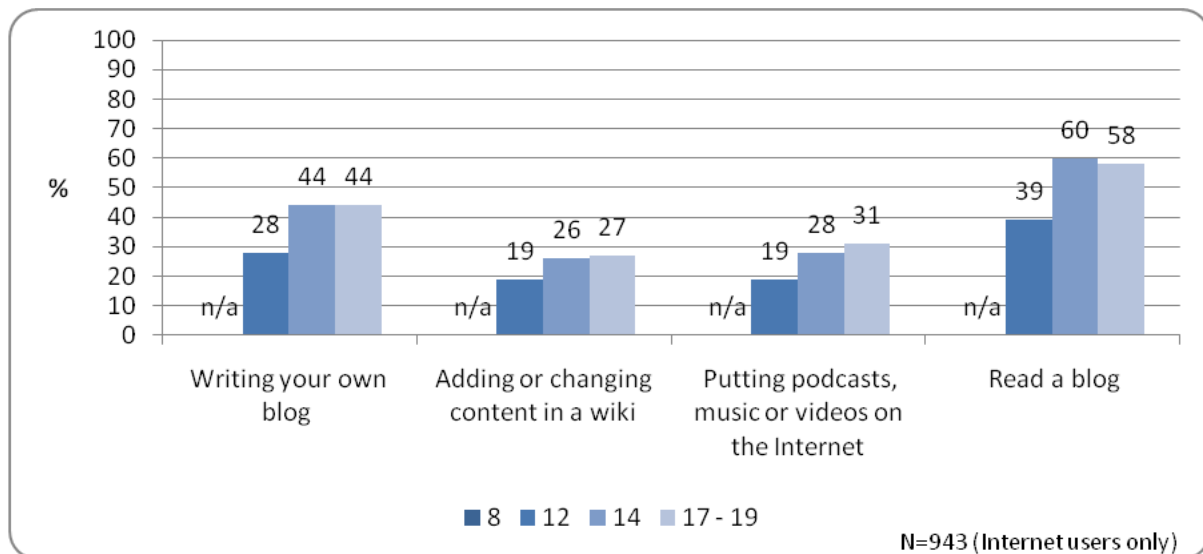


Figure 16: Participating by age (% of respondents who carry out this activity every few months)

The means of the 'participating' items were combined to create a single factor.

ANOVA was used to explore the effects of age and gender of internet users on the use of the internet and computers for participating for the three oldest age groups (Figure 17). There is a significant main effect of age on the use of the internet for participating: internet users aged 17–19 or 14 are significantly more frequent users of the internet for participatory purposes than 12-year-olds are. There are no significant differences between boys' and girls' uses of the internet for participation, or any significant interaction effect between the age of internet users and their gender on the use of the internet for participation.

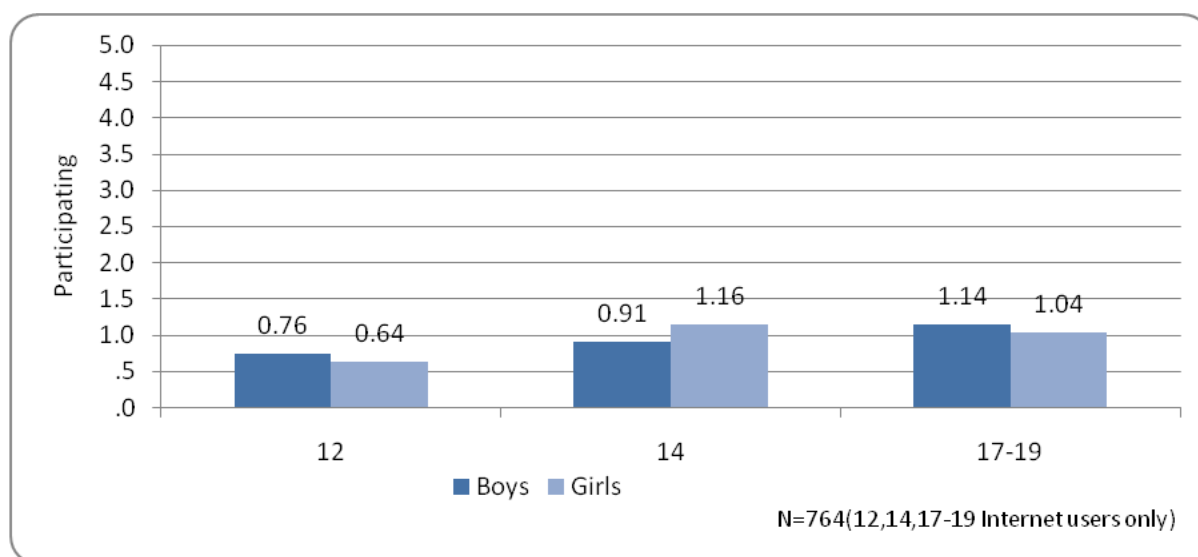


Figure 17: Participating by age and gender⁸

Using computers for homework

Participants who were still in formal education were asked a range of questions about their uses of computers and the internet for homework. From the factor analysis, three main activities emerged: producing homework; researching homework; and using a VLE, which, in schools, is often referred to as an LMS (learning management system).

The first 'using computers for homework' factor, producing homework, was based on four items covering using a computer for creating homework: writing homework on the computer; making a slide presentation; editing images or pictures for a school project; and using a spreadsheet.

The percentage of internet users in each age group who reported carrying out each kind of homework activity at least once every few months is summarised in Figure 18. Internet users aged 17–19 who are still in education tend to be the most likely of the four age groups to use the computer for producing homework. For example, 13 per cent of 8-year-olds, 56 per cent of 12-year-olds, 63 per cent of 14-year-olds and 76 per cent of 17- to 19-year-olds use the computer make a slide presentation for homework at least once every few months.

⁸ This construct was developed from individual items where participants were asked how frequently they carry out specific activities on a scale (0 = never, 1 = every few months, 2 = monthly, 3 = weekly, 4 = daily and 5 = a few times a day). Thus the scale on the vertical axis gives an indication of the frequency of the use of the internet for participation.

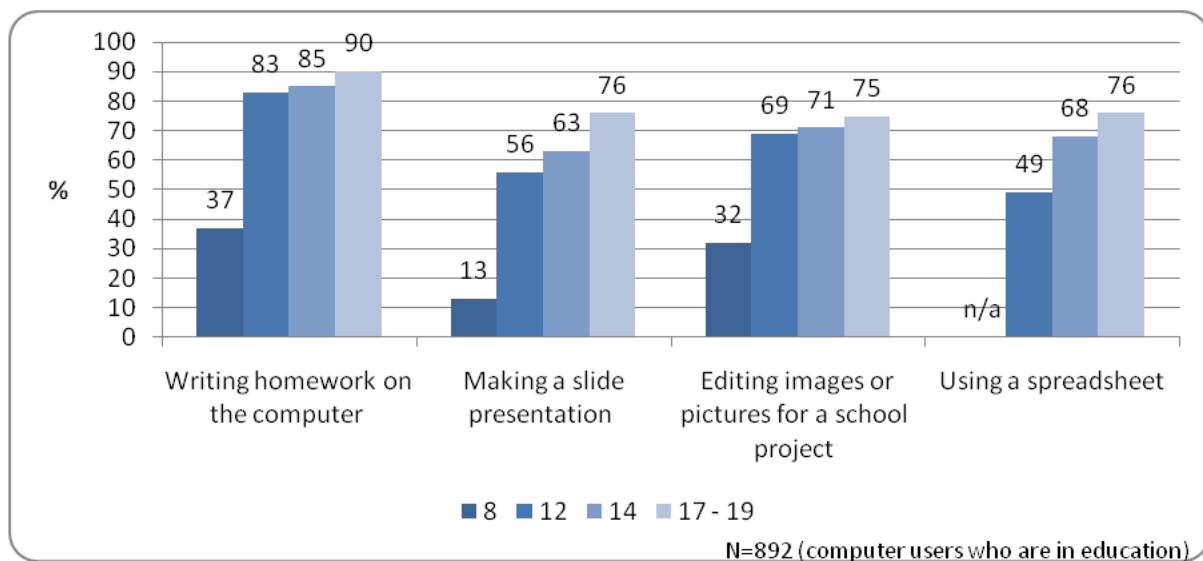


Figure 18: Producing homework by age (% of respondents who carry out this activity every few months)

The means of the 'producing homework' items were combined to create a single factor.

ANOVA was used to explore the effects of age and gender of internet users on the use of computers and the internet for producing homework for the three oldest age groups (Figure 19). There is a significant main effect of age: 17- to 19-year-old internet users who are still in formal education produce homework using computers and the internet significantly more often than internet users aged 12 or 14 do. There are no overall differences between boys' and girls' uses of computers and the internet for producing homework, but there is a significant interaction effect between the age of internet users and their gender: at ages 12 and 17–19, female internet users use a computer to produce homework less frequently than male internet users do; at age 14, female internet users are more frequent users of a computer to produce homework than male internet users are.

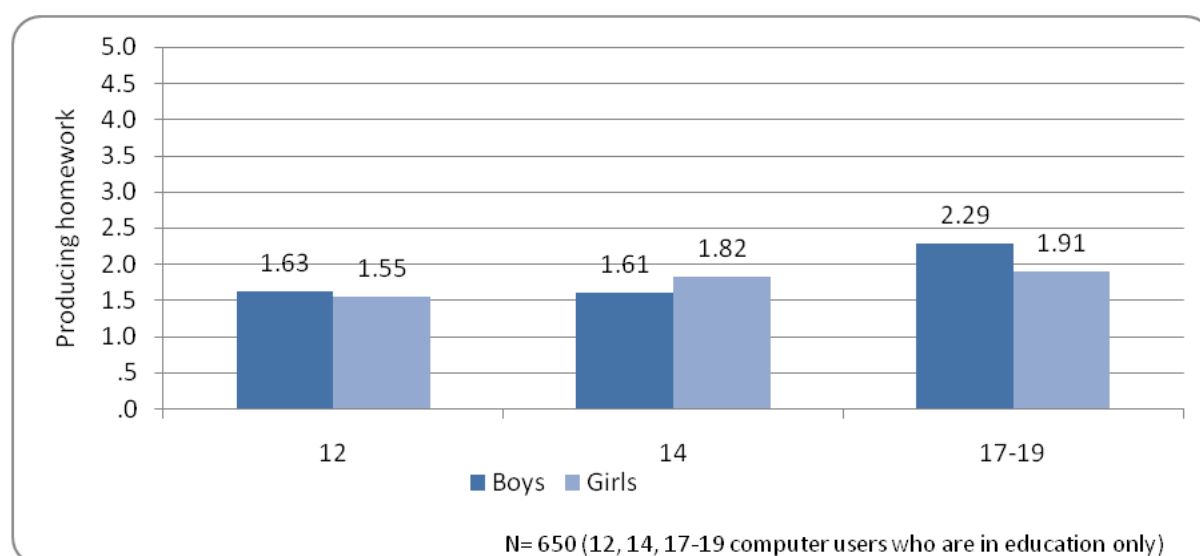
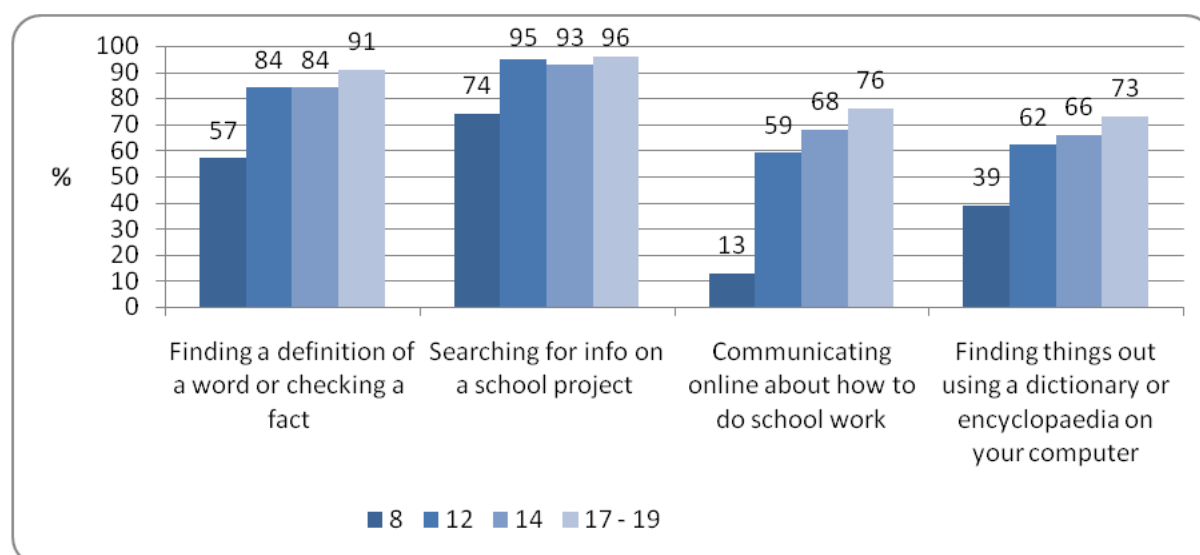


Figure 19: Producing homework by age and gender⁹

⁹ This construct was developed from individual items where participants were asked how frequently they carry out specific activities on a scale (0 = never, 1 = every few months, 2 = monthly, 3 = weekly, 4 = daily and 5 = a few times a day). Thus the scale on the vertical axis gives an indication of the frequency of the use of the internet for producing homework.

The second 'using computers for homework' factor, researching homework, was based on four items: finding a definition of a word or checking a fact; searching for information for a school project; communicating online with friends about how to do school work; and finding things out using a dictionary or encyclopaedia.

The percentage of internet users in each age group who reported carrying out each kind of homework activity at least once every few months is summarised in Figure 20. In general, activities related to researching homework tend to be relatively popular. Seventeen- to 19-year-old internet users who are still in education tend to be the most likely of the four age groups to use a computer for researching homework. For example, 57 per cent of 8-year-old, 84 per cent of 12-year-old, 84 per cent of 14-year-old and 91 per cent of 17- to 19-year-old internet users use a computer for finding a definition of a word or checking a fact at least once every few months.

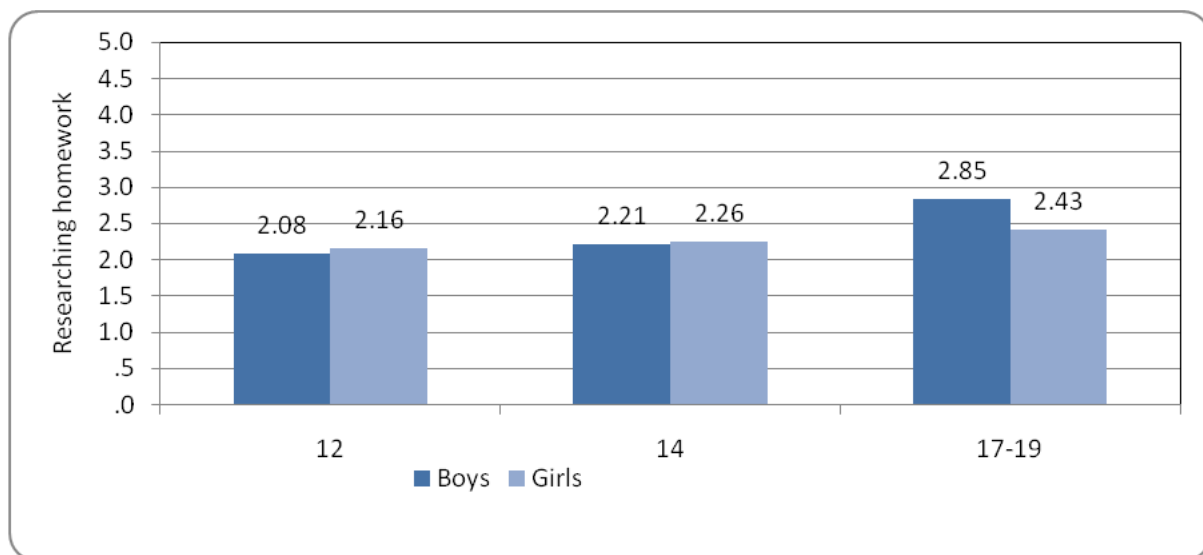


N=822 (internet users who are in education).

Figure 20: Researching homework by age (% of respondents who carry out this activity every few months)

The means of the 'researching homework' items were combined to create a single factor.

ANOVA was used to explore the effects of age and gender of internet users on the use of the internet and computers for researching homework for the three oldest age groups who were still in education (Figure 21). Seventeen- to 19-year-old internet users who are still in formal education research homework using computers and the internet significantly more often than internet users aged 12 or 14 do. There is not a significant main effect of gender, nor is there a significant interaction effect between the age of internet users and their gender on the use of computers and the internet for researching homework.



N=640 (internet users aged 12, 14 and 17–19 who are in education).

Figure 21: Researching homework by age and gender¹⁰

¹⁰ This construct was developed from individual items where participants were asked how frequently they carry out specific activities on a scale (0 = never, 1 = every few months, 2 = monthly, 3 = weekly, 4 = daily and 5 = a few times a day). Thus the scale on the vertical axis gives an indication of the frequency of the use of the internet for researching homework.

The third 'using computers for homework' factor, using a VLE, covered two items: logging on to school, college, or university to find resources and websites; and logging on to school, college or university to find homework information.

Figure 22 summarises the percentage of internet users in each age group who reported carrying out each kind of VLE activity at least once every few months. Internet users aged 17–19 who are still in education tend to be the most likely of the four age groups to use VLEs. For example, 20 per cent of 8-year-old, 58 per cent of 12-year-old, 57 per cent of 14-year-old and 82 per cent of 17- to 19-year-old internet users use a VLE or LMS to find resources and websites at least once every few months.

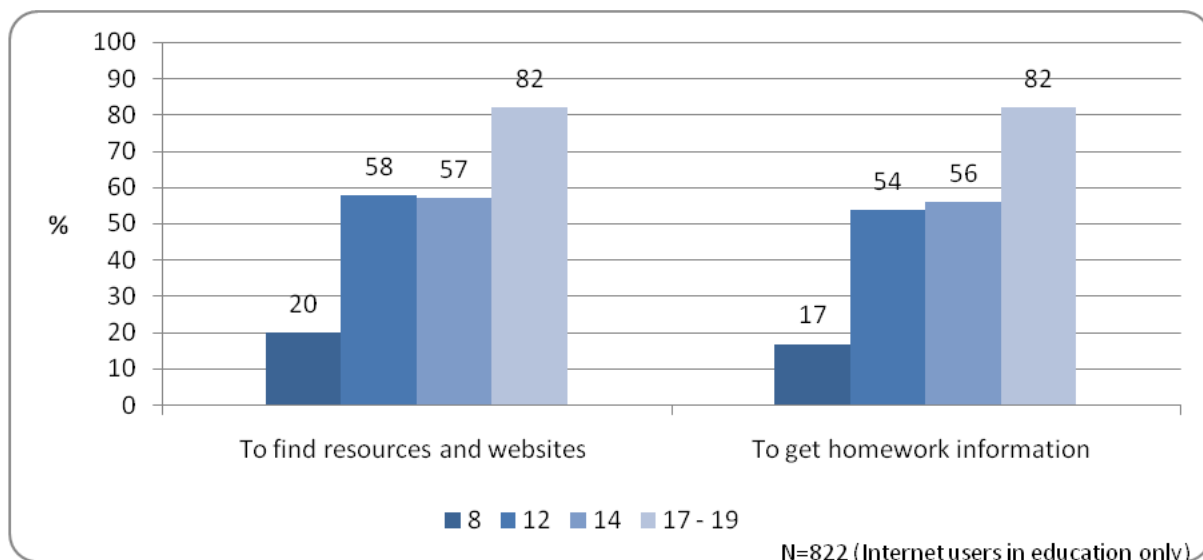


Figure 22: Using a VLE by age (% of respondents who carry out this activity every few months)

The means of the two 'using a VLE' items were then combined to create a single factor.

ANOVA was used to explore the effects of age and gender of internet users on the use of a VLE for the three oldest age groups (Figure 23). There is a significant main effect of age on young people's use of VLEs: 17- to 19-year-old internet users who are still in formal education use a VLE significantly more often than internet users aged 12 or 14 do. There is not a significant main effect of gender on the use of VLEs, nor is there a significant interaction effect between the age of internet users and their gender on the use of a VLE.

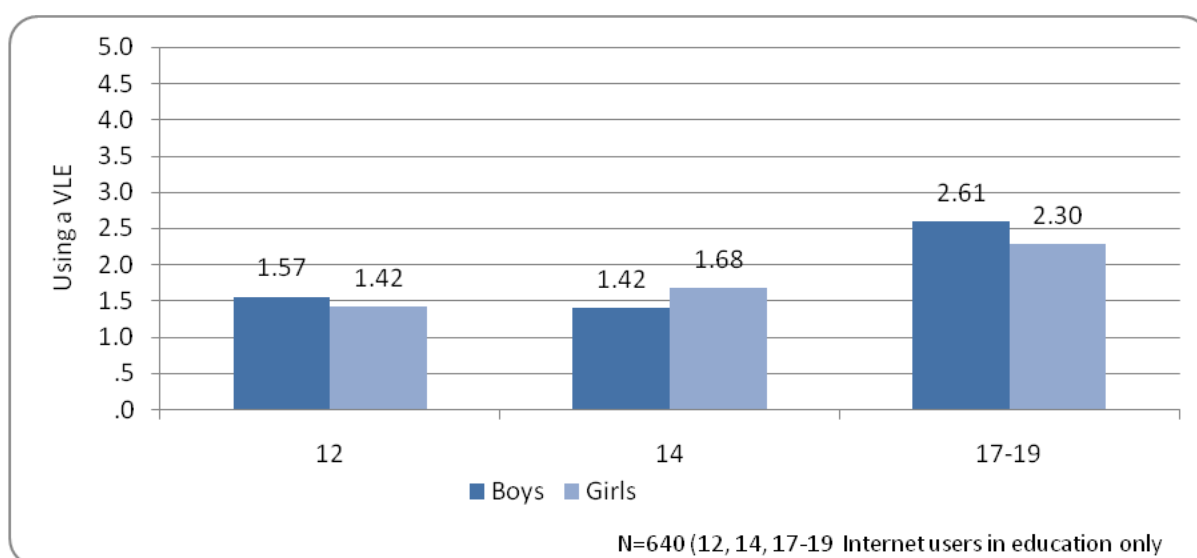


Figure 23: Using a VLE by age and gender¹¹

Multi-tasking while doing homework

Participants were asked how often (never, sometimes, often, always) they had specific applications open on their computer while doing their homework. From the factor analysis, two types of multi-tasking, specifically while doing homework, were identified: constructive multi-tasking and distractive multi-tasking. Constructive multi-tasking was based on three items – using a search engine, having instant messenger open, and playing music – that, from the qualitative aspects of the project, appeared to indicate that young people were setting an environment that tended to be conducive to study.

¹¹ This construct was developed from individual items where participants were asked how frequently they carry out specific activities on a scale (0 = never, 1 = every few months, 2 = monthly, 3 = weekly, 4 = daily and 5 = a few times a day). Thus the scale on the vertical axis gives an indication of the frequency of use of a VLE or an LMS.

The percentages of internet users in each age group who reported having each application open at least sometimes when carrying out each kind of homework activity are summarised in Figure 24. Internet users aged 17–19 who are still in education tend to be the most likely to have one of the 'constructive multi-tasking' applications open when doing homework. For example, 32 per cent of 8-year-old, 65 per cent of 12-year-old, 77 per cent of 14-year-old and 85 per cent of 17- to 19-year-old internet users play music on their computers at least sometimes while doing homework.

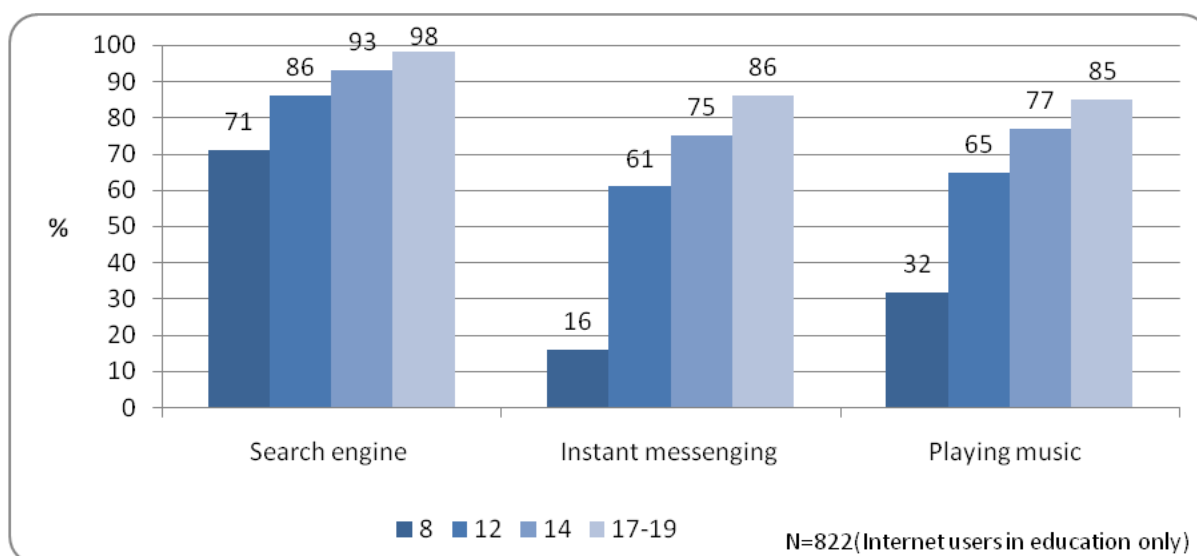


Figure 24: Constructive multi-tasking by age (% of respondents who carry out this activity every few months)

The means of the three 'constructive multi-tasking' items were combined to create a single factor.

ANOVA was used to explore the effects of age and gender of internet users who are still in education on the use of constructive multi-tasking while doing homework (Figure 25). There is a significant main effect of age on constructive multi-tasking while doing homework: 17- to 19-year-old and 14-year-old internet users constructively multi-task significantly more often than internet users aged 8 or 12 do. Gender is not significant. There is no significant interaction effect between the age of internet users and their gender on constructive multi-tasking while doing homework.

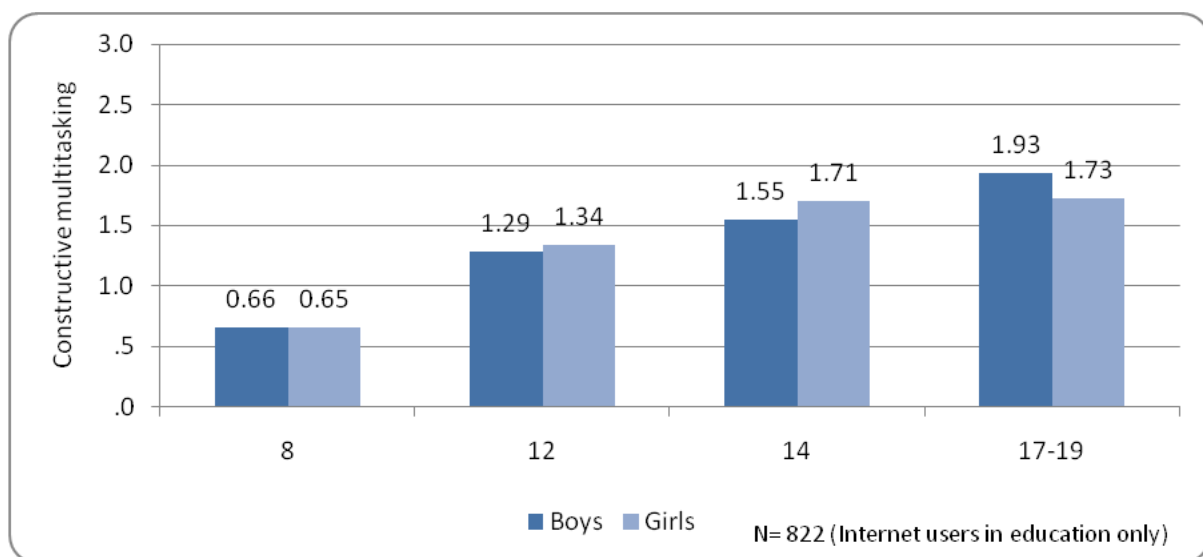


Figure 25: Constructive multi-tasking by age and gender¹²

¹² This construct was developed from individual items where participants were asked how frequently they carry out specific activities on a scale (0 = never, 1 = sometimes, 2 = often, 3 = always). Thus the scale on the vertical axis gives an indication of the frequency of constructive multi-tasking while doing homework.

The second factor, distractive multi-tasking, comprised three items that, based on the qualitative findings from the Learner and their Context study, arguably indicate young people setting an environment that will not be conducive to study: using a computer to watch TV on demand; watching videos on a computer; and playing games on a computer.

Figure 26 summarises the percentage of internet users in each age group who reported having a specific application open at least sometimes when doing homework. The patterns of use by age differ according to the application. For example, 10 per cent of 8-year-old, 29 per cent of 12-year-old, 35 per cent of 14-year-old and 37 per cent of 17- to 19-year-old internet users still in education watch TV on demand on their computers at least sometimes while doing homework. Fifty-six per cent of 8-year-old, 63 per cent of 12-year-old, 57 per cent of 14-year-old and 41 per cent of 17- to 19-year-old internet users still in education play games on their computers at least sometimes while doing homework.

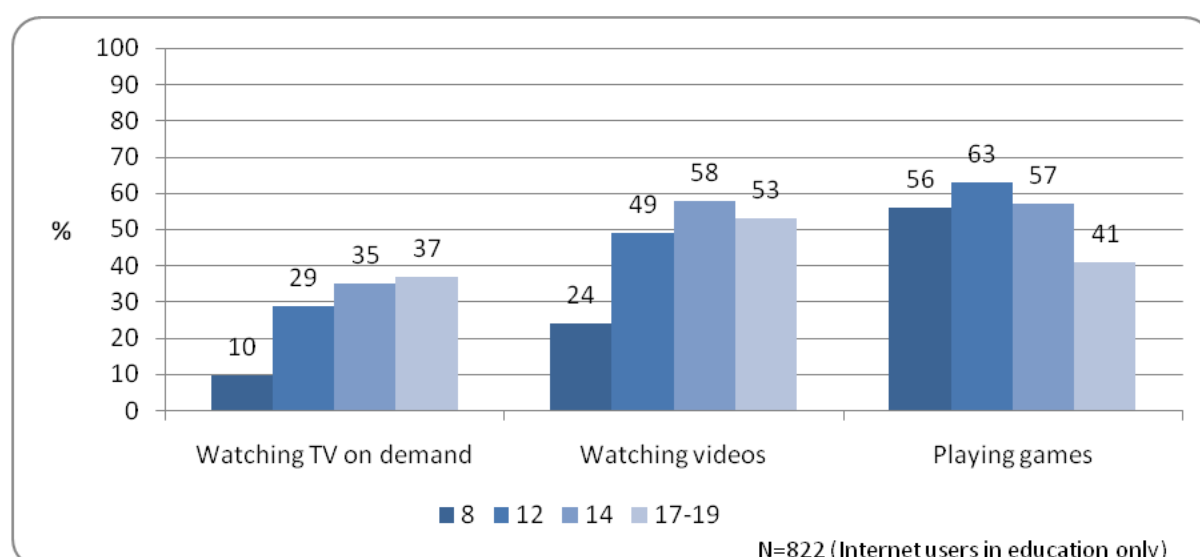


Figure 26: Distractive multi-tasking by age (% of respondents who carry out this activity every few months)

The means of the three 'distractive multi-tasking' items were combined to create the single factor.

ANOVA was used to explore the effects of age and gender of internet users still in education on the use of distractive multi-tasking while doing homework (Figure 27). There is a significant main effect of age on distractive multi-tasking while doing homework: internet users aged 14 or 12 significantly more often distractively multi-task while doing homework than internet users aged 8 do. Female internet users are significantly less likely than male internet users to engage in distractive multi-tasking while doing homework. There is no significant interaction effect between the age of internet users and their gender on distractive multi-tasking while doing homework.

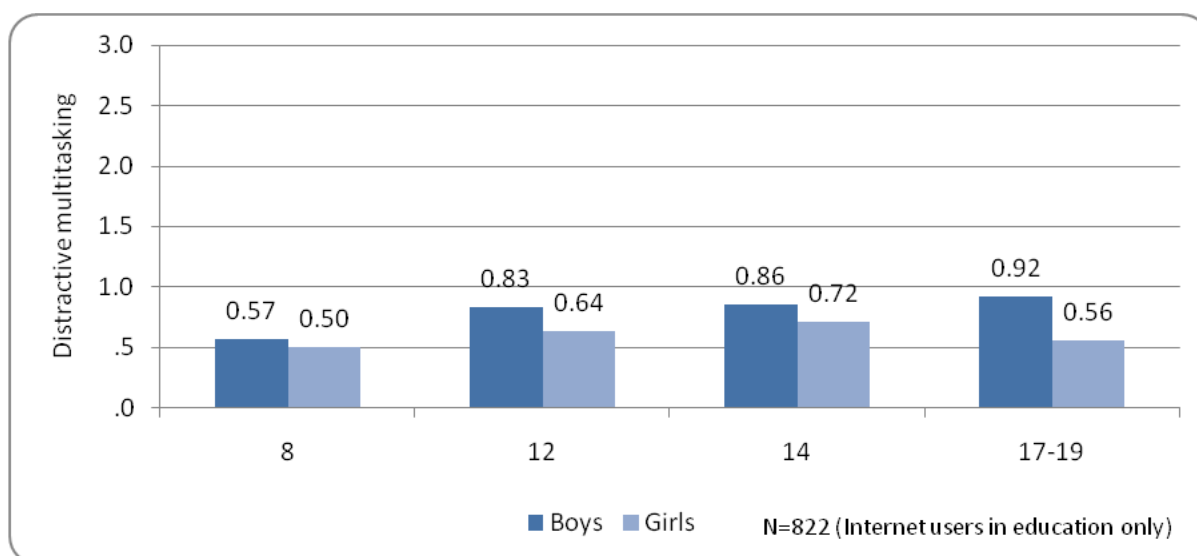


Figure 27: Distractive multi-tasking by age and gender¹³

Playing games

The survey participants who played computer and console games were asked whether and how often they played certain types of games outside lessons or lectures. From a factor analysis of these items, two types of game playing were identified: strategy and action games, and society and environment games.

¹³ This construct was developed from individual items where participants were asked how frequently they carry out specific activities on a scale (0 = never, 1 = sometimes, 2 = often, 3 = always). Thus the scale on the vertical axis gives an indication of the frequency of distractive multi-tasking while doing homework.

The first 'playing games' factor, strategy and action games, was based on five items: action and adventure games; role playing, tactical, massively multiplayer games; strategy games; vehicle simulation games; and sports management games.

The percentage of game players in each age group who played each of the types of games at least every few months is summarised in Figure 28. In general, the pattern of use suggests that eight-year-olds are less likely than other age groups to play strategy and action games. For example, 54 per cent of 8-year-old, 67 per cent of 12-year-old, 65 per cent of 14-year-old and 74 per cent of 17- to 19-year-old game players play sports management games at least every few months.

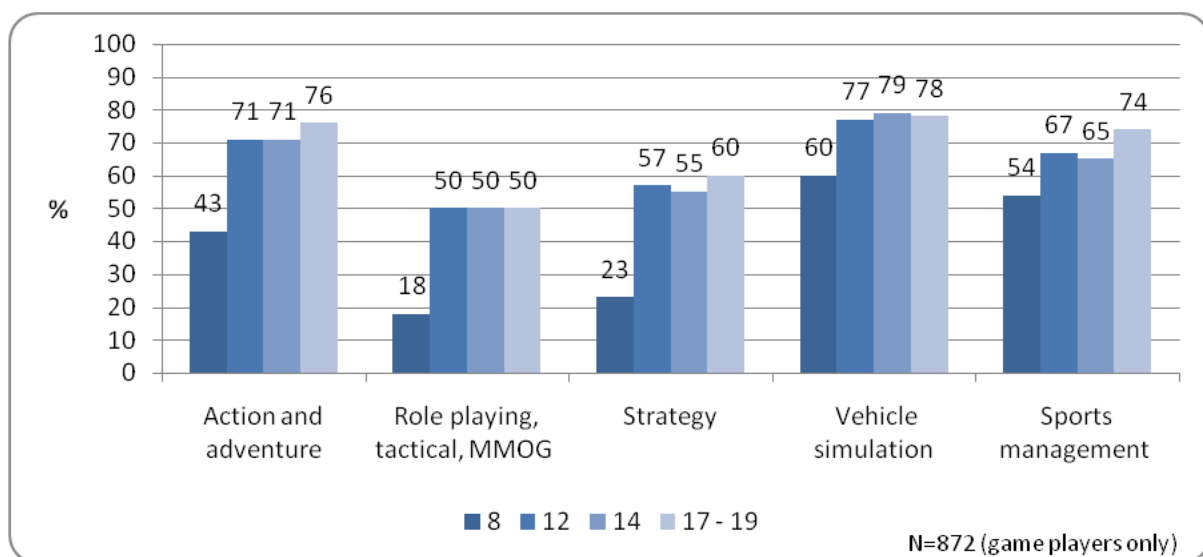


Figure 28: Strategy and action games by age (% of respondents who carry out this activity every few months)

The means of the five 'strategy and action games' items were combined to create a single factor called

ANOVA was used to explore the effects of age and gender of game players on playing strategy and action games for the three oldest age groups (Figure 29). There is no significant effect of the age of game players on playing action and strategy games. There is a significant main effect of gender: male game players play more strategy and action games than female game players do. There is no significant interaction effect between the age of game players and their gender on playing action and strategy games.

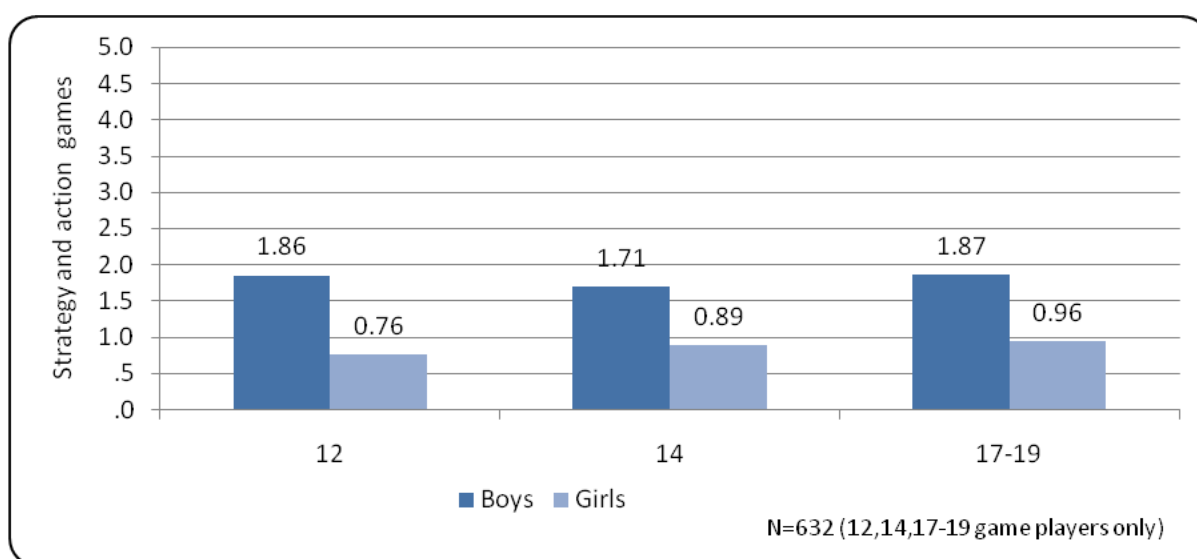


Figure 29: Strategy and action games by age and gender¹⁴

¹⁴ In the original items, participants were asked how frequently they play specific types of games on a scale (0 = never, 1 = every few months, 2 = monthly, 3 = weekly, 4 = daily and 5 = a few times a day). Thus the scale on the vertical axis gives an indication of the frequency of playing strategy and action games.

The second 'playing games' factor identified, society and environment games, was based on three items: building and management simulation; social simulation; and pet-raising simulation.

The percentage of game players in each age group who played each of the types of games at least every few months is summarised in Figure 30. Interestingly, game players aged 8 are the least likely to play building and management and social simulation games but are the most likely to play pet simulation games: 67 per cent of 8-year-old, 64 per cent of 12-year-old, 57 per cent of 14-year-old and 37 per cent of 17- to 19-year-old game players play pet-raising simulation games at least every few months.

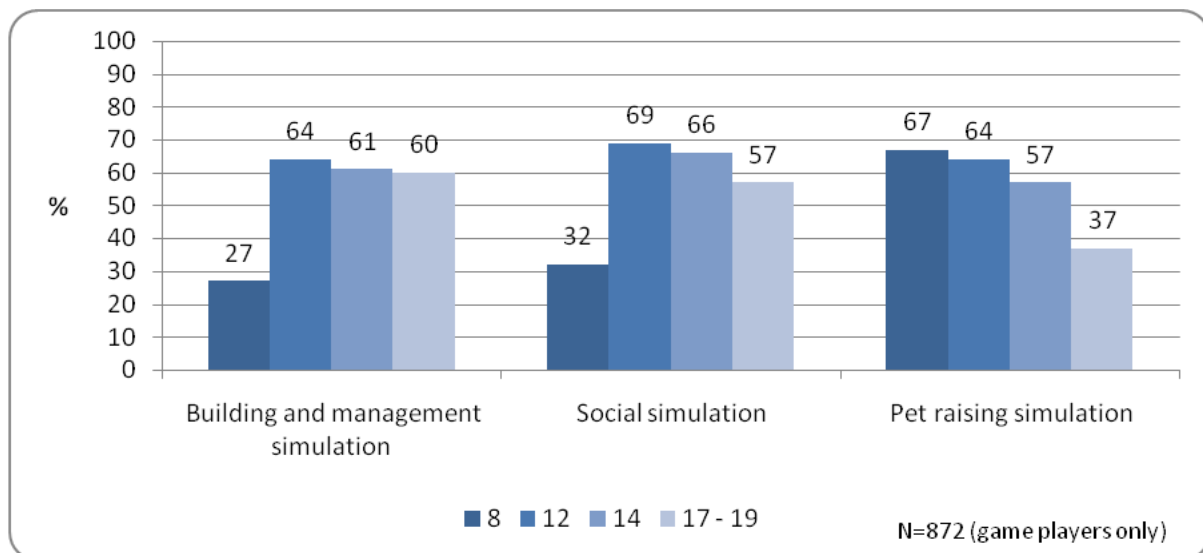


Figure 30: Society and environment games (% of respondents who carry out this activity every few months)

The means of the three 'society and environment games' items were combined to create a single factor.

ANOVA was used to explore the effects of age and gender of game players on playing society and environment games for the three oldest age groups (Figure 31). There is a non-significant main effect of the age of the game player on playing society and environment games. Girl game players play society and environment games more often than boy game players do. There is no significant interaction effect between the age of the game players and their gender on playing society and environment games.

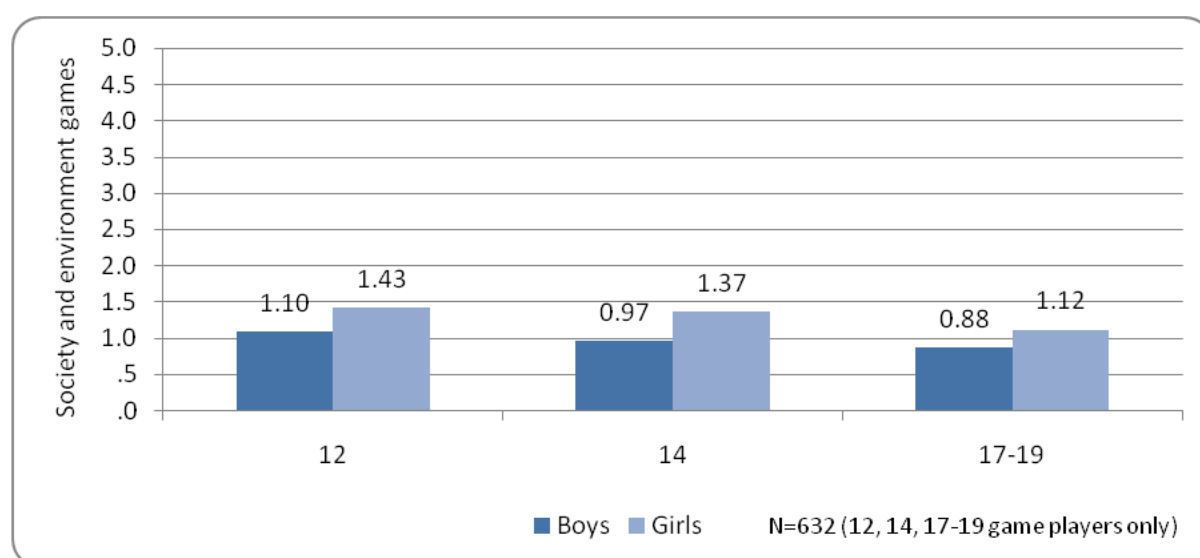


Figure 31: Society and environment games by age and gender¹⁵

Using mobile phones

The survey participants who used a mobile phone were asked a range of questions about whether and how often they used their mobile phones for a range of purposes outside formal lessons or lectures. From the factor analysis, three types of mobile phone use were identified: texting and calling; multimedia; and accessing the internet.

¹⁵ This construct was developed from individual items where participants were asked how frequently they play specific types of games on a scale (0 = never, 1 = every few months, 2 = monthly, 3 = weekly, 4 = daily and 5 = a few times a day). Thus the scale on the vertical axis gives an indication of the frequency of the playing of society and environment games.

Texting and calling was based on two items: making calls and sending text messages. Unsurprisingly, texting and calling are popular uses of a mobile phone. There was a significant difference in the proportion of eight-year-olds who use a mobile phone for making calls and sending text messages in comparison with mobile phone users from the older age groups. For example, 78 per cent of 8-year-old, 97 per cent of 12-year-old, 96 per cent of 14-year-old and 99 per cent of 17- to 19-year-old mobile phone users make calls on their mobiles at least every few months (Figure 32).

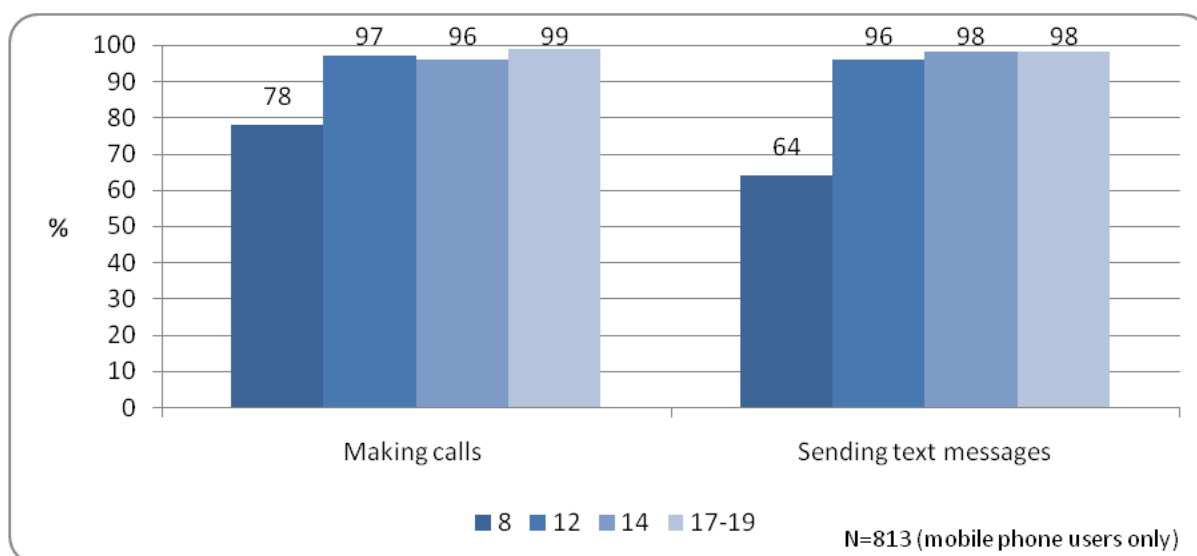


Figure 32: Texting and calling by age (% of respondents who carry out this activity every few months)

The means of the two 'texting and calling' items were combined to create a single factor.

ANOVA was used to explore the effects of age and gender of mobile phone users on using a mobile phone for texting and calling for the three oldest age groups (Figure 33). There is a significant main effect of age: 17- to 19-year-old mobile phone users use mobile phones for texting and calling significantly more often than mobile phone users aged 12 or 14 do. Overall, female mobile phone users use a mobile phone for texting and calling more often than male mobile phone users do. There is no significant interaction effect between the age of young people and their gender on frequency of using a mobile phone for texting and calling.

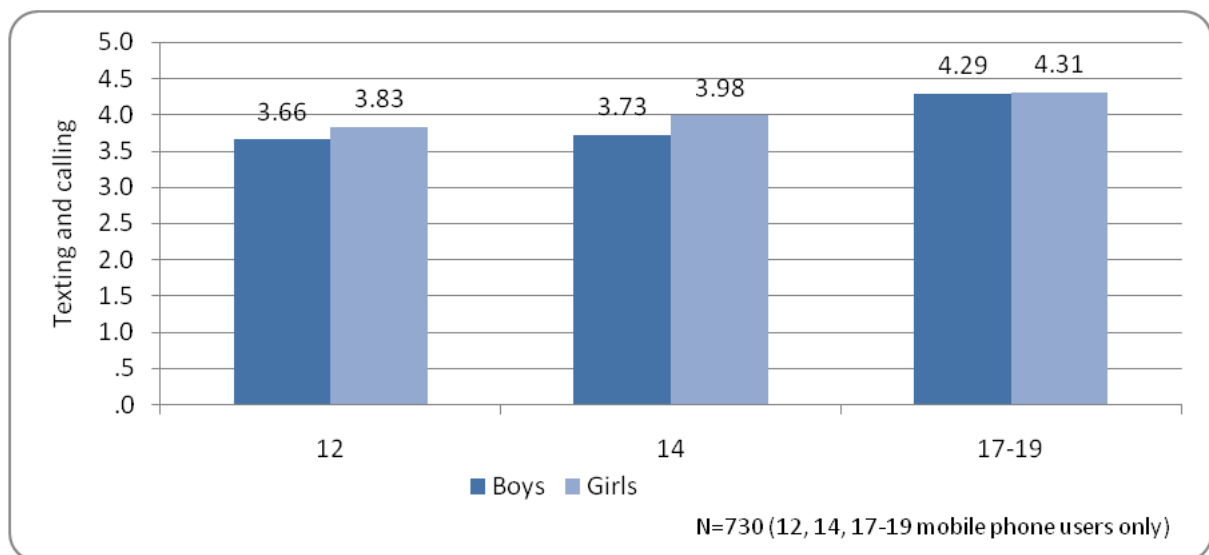
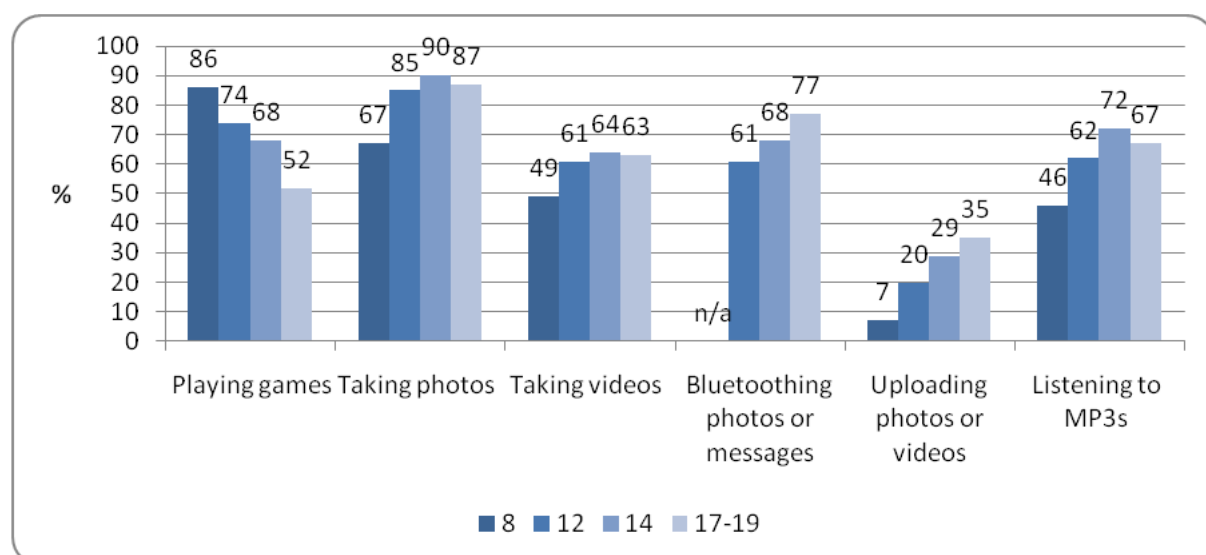


Figure 33: Texting and calling by age and gender¹⁶

¹⁶ This construct was developed from individual items where participants were asked how frequently they carry out specific activities on their phone on a scale (0 = never, 1 = every few months, 2 = monthly, 3 = weekly, 4 = daily and 5 = a few times a day). Thus the scale on the vertical axis gives an indication of the frequency of using a mobile phone for texting and calling.

The second 'using mobile phones' factor, multimedia, was based on six items that cover multimedia uses of mobile phones: playing games, taking photos, taking videos, sending photos or messages using Bluetooth, uploading photos or videos to the internet, and listening to MP3s.

The patterns of use by age of mobile phone users vary according to the individual item but, overall, with the exception of games, mobile phone users from the older age groups tend to be more likely to use their mobile phones for multimedia purposes at least every few months. As shown in Figure 34, 67 per cent of 8-year-old, 85 per cent of 12-year-old, 90 per cent of 14-year-old and 87 per cent of 17- to 19-year-old mobile phone users take photos on their mobiles at least every few months. Eighty-six per cent of 8-year-old, 74 per cent of 12-year-old, 68 per cent of 14-year-old and 52 per cent of 17- to 19-year-old mobile phone users play games on their mobiles at least every few months.



N=813 (mobile phone users only).

Figure 34: Multimedia mobile phone use by age (% of respondents who carry out this activity every few months)

The means of the six 'multimedia' items were then combined to create a single factor.

ANOVA was used to explore the effects of age and gender of mobile phone users on using a mobile phone for multimedia purposes for the three oldest age groups (Figure 35). There is no significant main effect of age or gender and no significant interaction effect between the age of mobile phone users and their gender on multimedia mobile phone use.

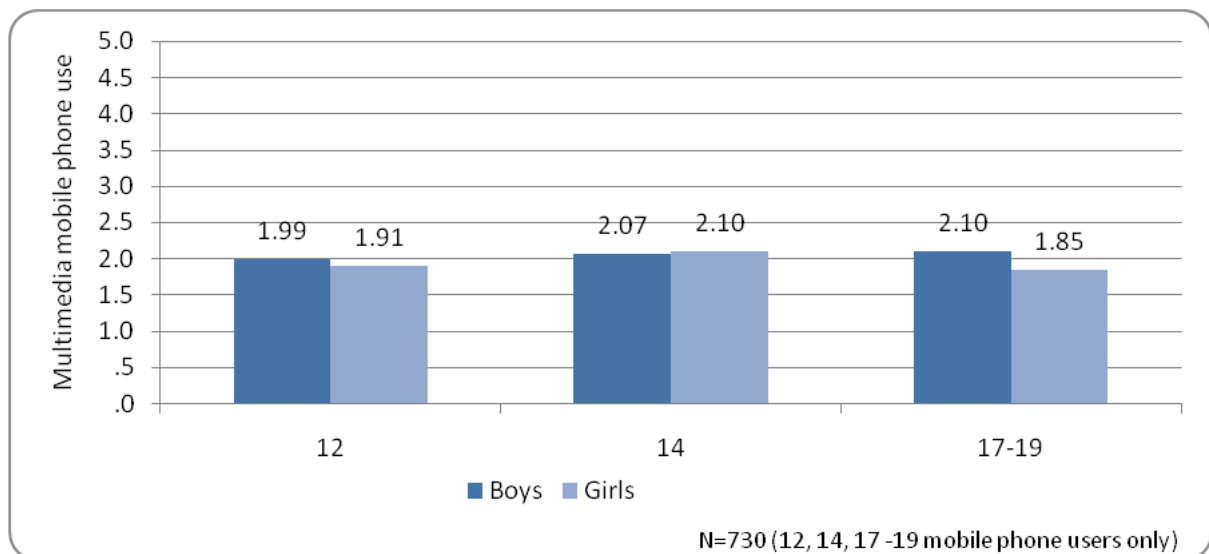


Figure 35: Multimedia mobile phone use by age and gender¹⁷

¹⁷ This construct was developed from individual items where participants were asked how frequently they carry out specific activities on their mobile phones on a scale (0 = never, 1 = every few months, 2 = monthly, 3 = weekly, 4 = daily and 5 = a few times a day). Thus the scale on the vertical axis gives an indication of the frequency of using a mobile phone for multi-media purposes.

The third 'using mobile phones' factor, accessing the internet, was based on two items: using a mobile phone to access email, and using a mobile phone to access the internet.

In general, the amount that mobile phone users access the internet is quite low in comparison with other activities. Mobile phone users from the older age groups tend to be more likely than mobile phone users aged eight to use their mobile phones to access the internet and email. For example, 3 per cent of 8-year-old, 13 per cent of 12-year-old, 13 per cent of 14-year-old and 20 per cent of 17- to 19-year-old mobile phone users access email on their mobile phones at least every few months (Figure 36).

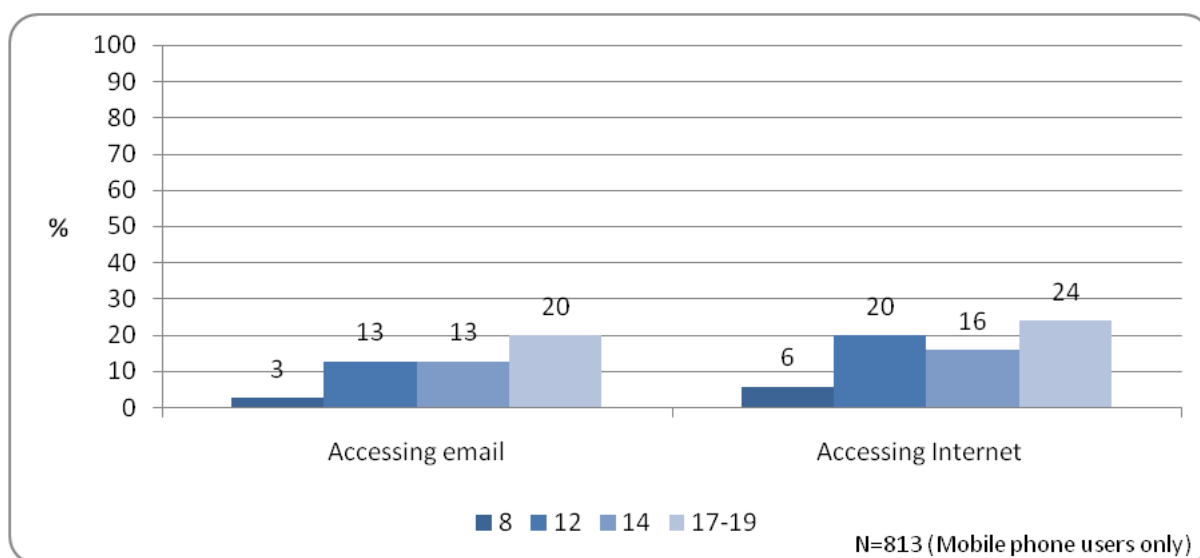


Figure 36: Accessing the internet on a mobile phone by age (% of respondents who carry out this activity every few months)

The means of the two 'accessing the internet' items were combined to create a single factor.

ANOVA was used to explore the effects of age and gender of mobile phone users on using a mobile phone for accessing the internet for the three oldest age groups (Figure 37). There is a significant main effect of age on accessing the internet on a mobile phone: 17- to 19-year-old mobile phone users are more frequent users than mobile phone users aged 14 of their mobile phones to access email and the internet. There is no significant gender difference and there is a non-significant interaction effect between the age of mobile phone users and their gender on accessing the internet on a mobile phone.

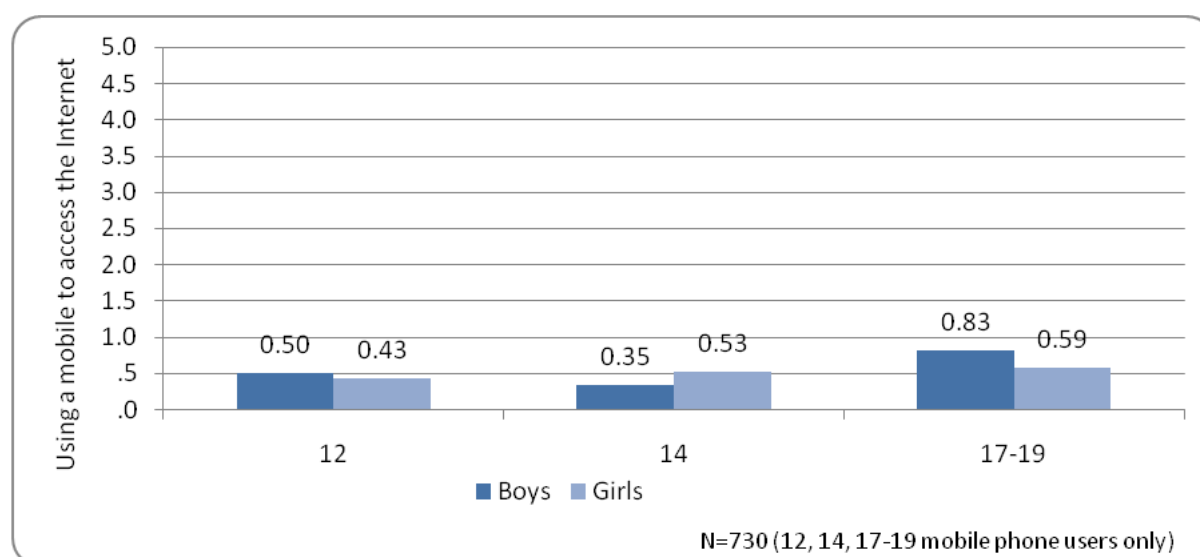


Figure 37: Accessing the internet on a mobile by age and gender¹⁸

Summary: uses of technology by young people

Young people tend to be relatively high users of technology, particularly in terms of computer and internet access. Indeed, at the ages of 12 and 14, the use of a computer and the internet is almost universal. Age and gender are both important in understanding use and non use of technologies. With the exception of playing computer and console games, 8-year-olds tend to be significantly lower users of all technologies compared with older age groups. Gender is also important: more girls than boys use mobile phones and digital cameras, and boys tend to use computer and console games more frequently than girls do.

¹⁸ This construct was developed from individual items where participants were asked how frequently they carry out specific activities on their mobile phones on a scale (0 = never, 1 = every few months, 2 = monthly, 3 = weekly, 4 = daily and 5 = a few times a day). Thus the scale on the vertical axis gives an indication of the frequency of accessing the internet on a mobile phone.

Of course, it is important not just to know whether someone uses a technology, but also how they use it. Young people use computers and the internet for communicating, information seeking, entertainment, creativity and participating. Communicating tends to be the most popular activity; creativity and participation activities the least popular.

Age is an important factor in understanding the frequency with which young people undertake certain activities online. In general, older internet users tend to use computers and the internet more often for communicating, information seeking, entertainment and participating. Younger internet users tend to use computers and the internet more often for creative purposes.

Gender is also key: female internet users are more frequent users of the internet for communicating; male internet users use computers and the internet more frequently for entertainment.

When focusing on using computers and the internet for homework, three main types of activities were identified: using a computer and the internet for producing homework; researching homework; and using a VLE or LMS. Of the three activities, researching homework is the most frequent activity and using a VLE or LMS the least frequent.

Age is again an important factor: 17- to 19-year-old internet users who are still in formal education research homework, produce homework and use a VLE or LMS significantly more often than internet users aged 12 or 14 do.

While doing homework, a significant proportion of young people tend to multi-task, which can be constructive or distractive. Interestingly, constructive multi-tasking is more common than distractive multi-tasking, and age and gender are again important. Seventeen- to 19-year-old and 14-year-old internet users constructively multi-task significantly more often than internet users aged 8 or 12 do. In addition, female internet users are significantly less likely than male internet users to engage in distractive multi-tasking while doing homework.

From analysis of the survey data, two broad types of game playing were identified: strategy and action games, and society and environment games.

Gender is an important factor in understanding who plays which games: girl game players tend to play society and environment games more frequently; boy game players tend to play action and strategy games more frequently.

Age is also important in understanding who plays which games: eight-year-olds are less likely than other age groups to play action and strategy games or society and

environment games. However, eight-year-olds are the most likely to play pet simulation games, which fall into the society and environment games category.

In terms of mobile phone use, three types of activities were identified: texting and calling, multimedia, and accessing the internet. Texting and calling are the most frequent activities, and accessing the internet is the least frequent.

Older mobile phone users are more likely to use the internet for texting and calling and accessing the internet, and, with the exception of games, mobile phone users from the older age groups also tend to be more likely to use their mobile phones for multimedia purposes.

Gender is also an important factor in understanding the use of mobile phones. Female mobile phone users tend to use a mobile phone for texting and calling more frequently than male mobile phone users do.

These findings are important for informing debates around both:

- what kinds of technological activities we would like to support young people to do (for example, should we try to encourage creativity online?)
- which technologies and uses of technologies we can expect young people to be engaged in when thinking about using technology for learning and education.

Meeting people online

Respondents were asked whether they had got to know someone online whom they had not met in person; 27 per cent of young people who used the internet reported they had. Internet users aged 17–19 were most likely to have got to know someone online, and 8-year-olds the least likely (Figure 38).

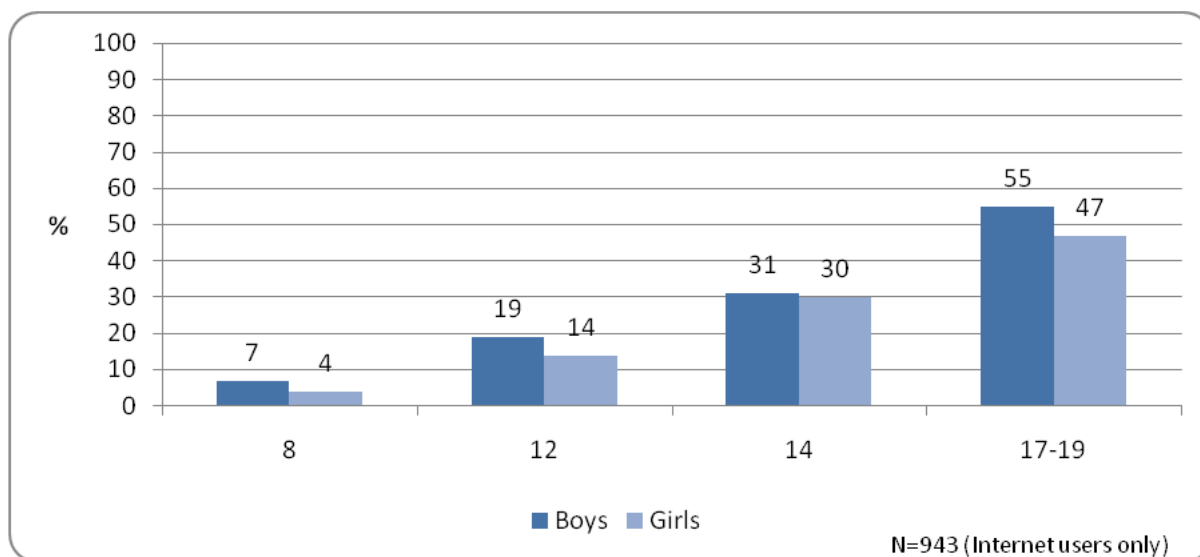


Figure 38: Meeting people online by age and gender (% of respondents)

Those aged 12 and over were asked where they met people online. Social networking sites are the most popular location for all age groups; 73 per cent of 12-year-olds, 91 per cent of 14-year-olds and 90 per cent of 17- to 19-year-olds who had got to know someone online had met the person on a social networking site (Figure 39).

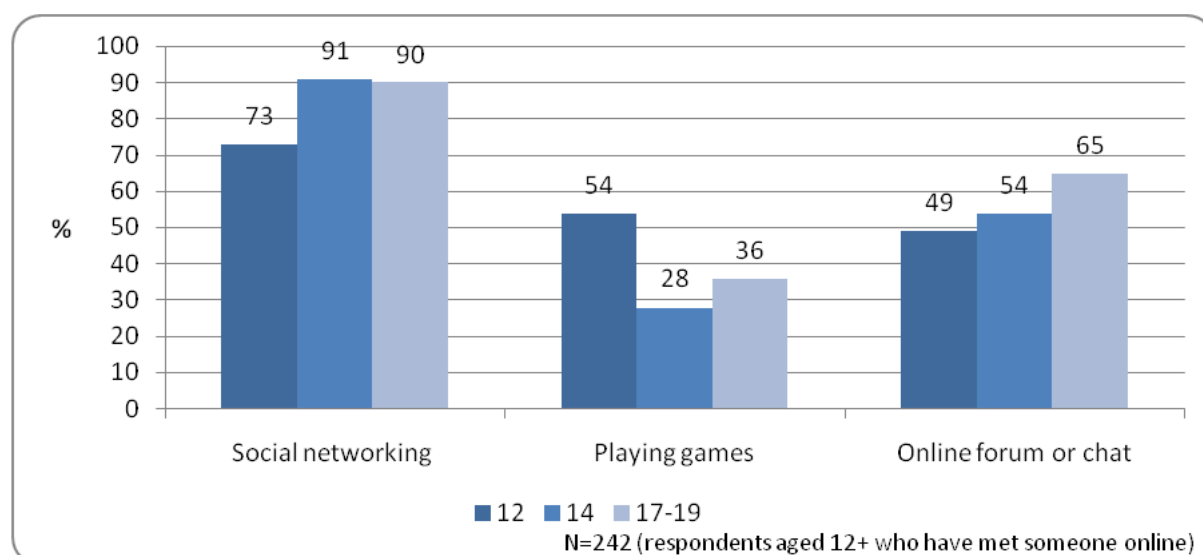


Figure 39: Place of meeting people online by age (% of respondents who carry out this activity every few months)

Of the group who had communicated with someone online whom they did not know in person, 28 per cent went on to meet the person face to face. It is important to stress that the number in each age group is very small, but generally those from older age groups are more likely to go on to meet people face to face: 15 per cent of 8-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 met up.

Summary: meeting people online

Around a quarter of internet users aged 8, 12, 14, and 17–19 have got to know someone online that they did not know in person. This activity is related to age: those from older age groups are more likely to engage in this activity.

Perhaps unsurprisingly social networking sites are the most popular location for all age groups to meet people, followed by online forums or chat.

Around a quarter of this group then go on to meet the individuals they get to know online in person. While the numbers are very small, this activity is positively related

to age, with those from older age groups more likely to meet up in person with the individuals they get to know online.

Safe use of technology

Giving out personal information

While meeting people online is not necessarily a safety issue, there are aspects of these situations that could potentially cause concern. One consideration is the extent to which young internet users may give out personal information to the people they meet online. Internet users who met people online whom they did not know in person were asked what information they gave out (participants could select all personal details that applied). As can be seen from Table 1, interests and hobbies (78 per cent), age (71 per cent) and email address (65 per cent) were the most frequent details given out.

Table 1: Personal details given out to people met online

Personal details	Per cent who had given out those details
Interests or hobbies	78
Age	71
Email address	65
Full name	47
A photo of yourself	45
Name of your school, college or university	32
Birthday	29
Your phone number	21
Where you live	16
Parents', brothers' or sisters' names	7

N = 252 (internet users who have met people online only)

While young internet users give out information intentionally, they may also be providing personal information online unintentionally. One of the most likely examples of this scenario is when a user of a social networking website determines the level of control over who can see their information. Fifty-five per cent of internet users aged 8, 12, 14 and 17–19 have a profile on a social networking site. Having a profile on a social networking website is significantly related to age: 17- to 19-year-olds are the most likely to have a social networking site. Of the 55 per cent who have a profile, 74 per cent allow only certain people to see their pages, 23 per cent let anyone see them, and 3 per cent do not know who can see them. Thus, most internet users in these age groups do seem to understand, at least to a certain extent, the potential implications of giving out personal information online.

Cyber-bullying

There has been a great deal of concern about the potential negative experiences under the broad category of cyber-bullying that young people may have when using technology. While not a key focus of this study, all survey participants were asked whether they had either been sent or someone had posted an upsetting message about them or picture of them on a computer or mobile phone. Interestingly, a relatively low proportion of the respondents – only 10 per cent – reported such an experience. In general, girls were more likely to report this kind of negative experience; 2 per cent of 8-year-old, 13 per cent of 12-year-old, 15 per cent of 14-year-old and 17 per cent of 17- to 19-year-old girls had either been sent or someone had posted an upsetting message about them or picture of them on a computer or mobile phone (Figure 40).

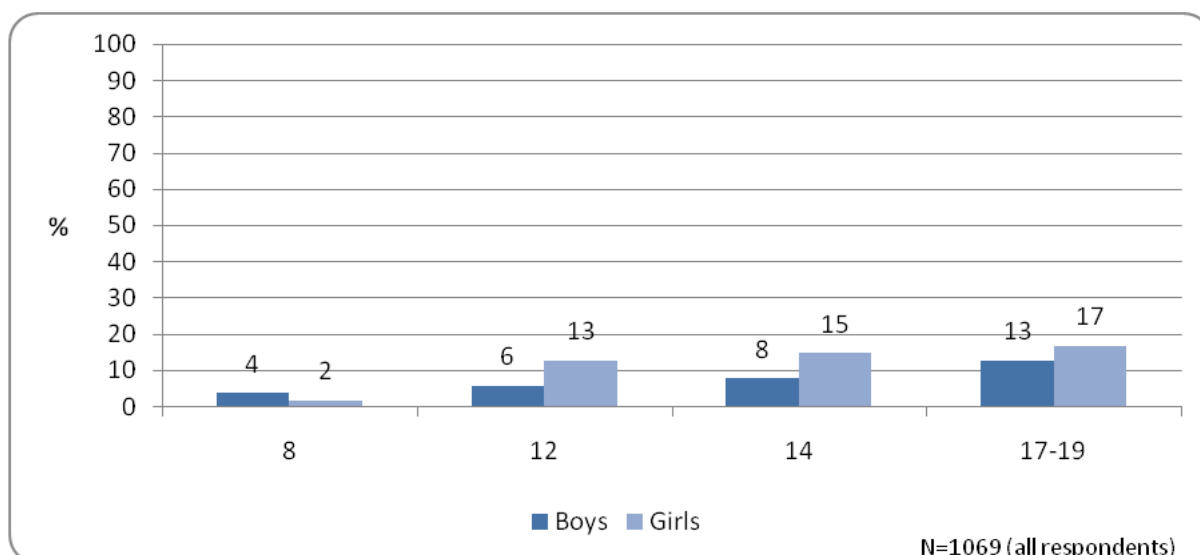


Figure 40: Upsetting messages and/or pictures by age and gender (% of respondents)

Those young people who reported receiving an upsetting message were asked what they did afterwards. Figure 41 shows what the participants did by age (participants could select multiple strategies). In general, the majority told someone in their family or told a friend; few did nothing. However, it is important to note that the numbers in each group are very small and thus should be interpreted with caution.

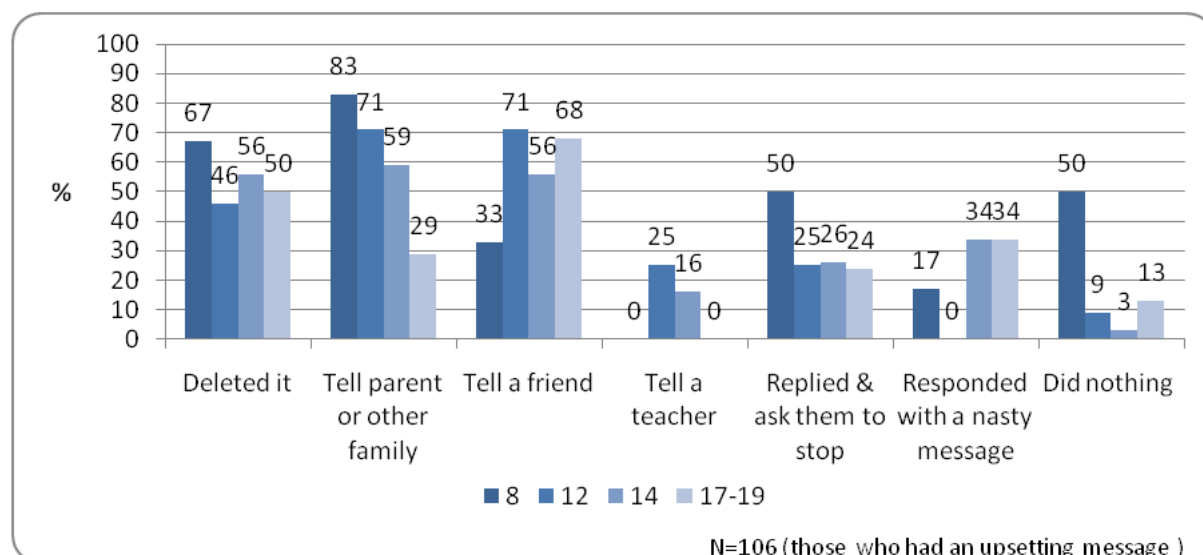


Figure 41: Dealing with an upsetting message by age (% of respondents who have received an upsetting message)

Online safety concerns

Internet users were asked to rate how worried they were about a range of potentially negative experiences on a scale from 0 = not at all, 1 = a little, 2 = a lot. The percentage of internet users who worried (either a little or a lot) about negative experiences is summarised by age in Figure 42. Interestingly, a computer virus is likely to be the biggest concern for internet users; 48 per cent of 8-year-old, 63 per cent of 12-year-old, 61 per cent of 14-year-old and 64 per cent of 17- to 19-year-old internet users were at least a little concerned about their computers getting a virus.

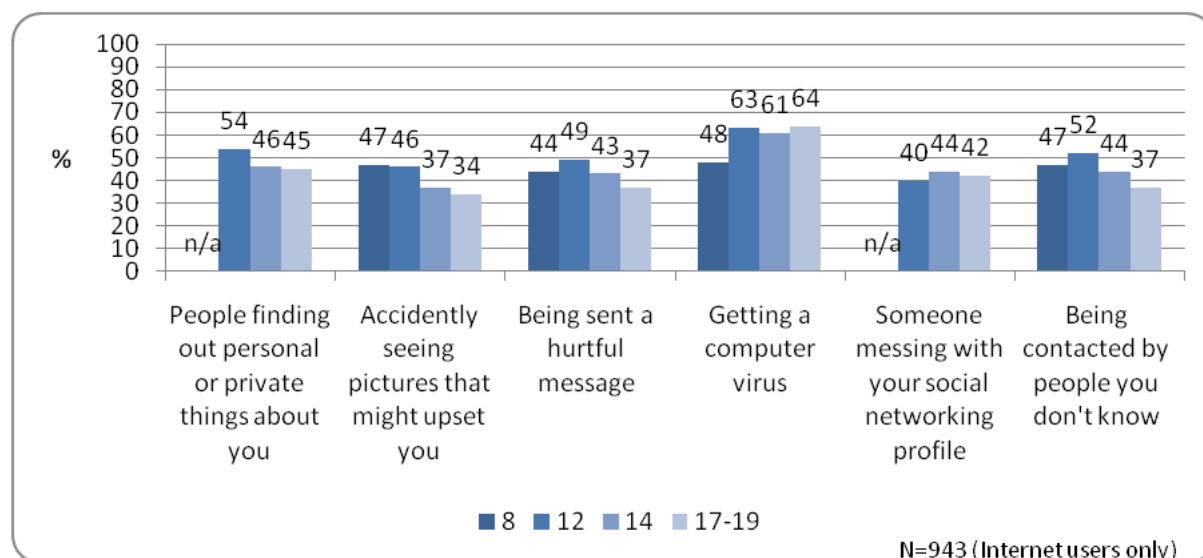


Figure 42: Safety concerns when going online by age (% of respondents who use the internet)

From a factor analysis of the six items, one factor was identified that reflected general concerns about online safety. The means of the six 'online safety concerns' items were combined to create a single factor.

ANOVA was used to explore the effects of age and gender of internet users on online safety concerns (Figure 43). There is no significant main effect of age on online safety concerns. Female internet users tend to have greater concerns than male internet users about online safety. There is no significant interaction effect between the age of internet users and their gender on online safety concerns.

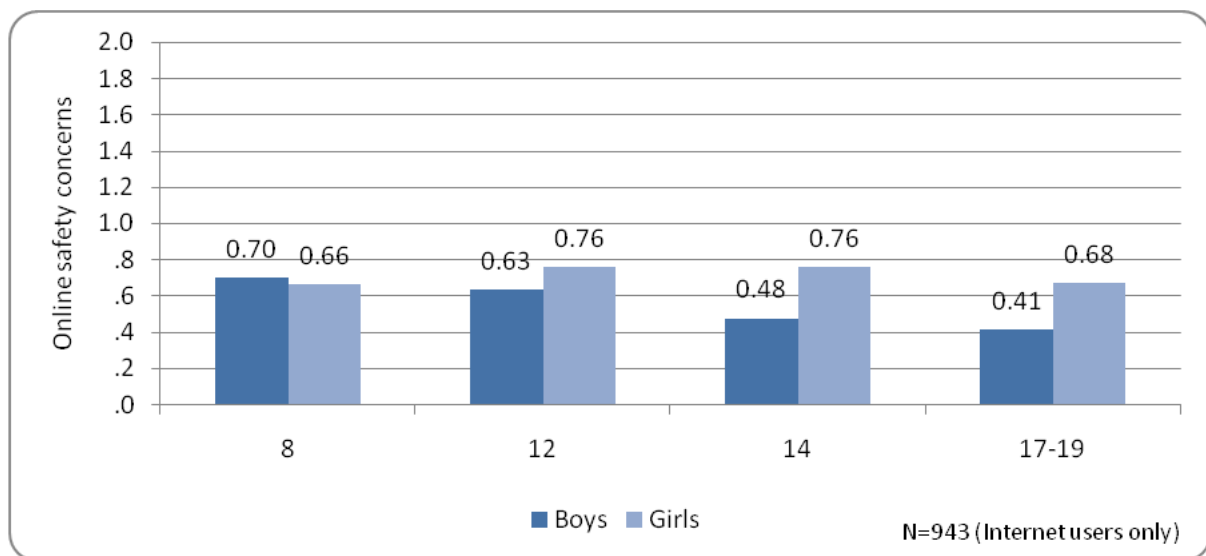


Figure 43: Online safety concerns by age and gender¹⁹

¹⁹ This construct was developed from individual items where participants were asked how worried they are about a range of potentially negative experiences on a scale (0 = not at all, 1 = a little, 2 = a lot). Thus the scale on the vertical axis gives an indication of the level of concern about online safety.

Confidence in keeping safe online

Internet users were asked to rate how confident they were in keeping safe on the internet. As can be seen in Figure 44, age is important: internet users aged 8 are the least confident whereas 17- to 19-year-olds are the most confident.

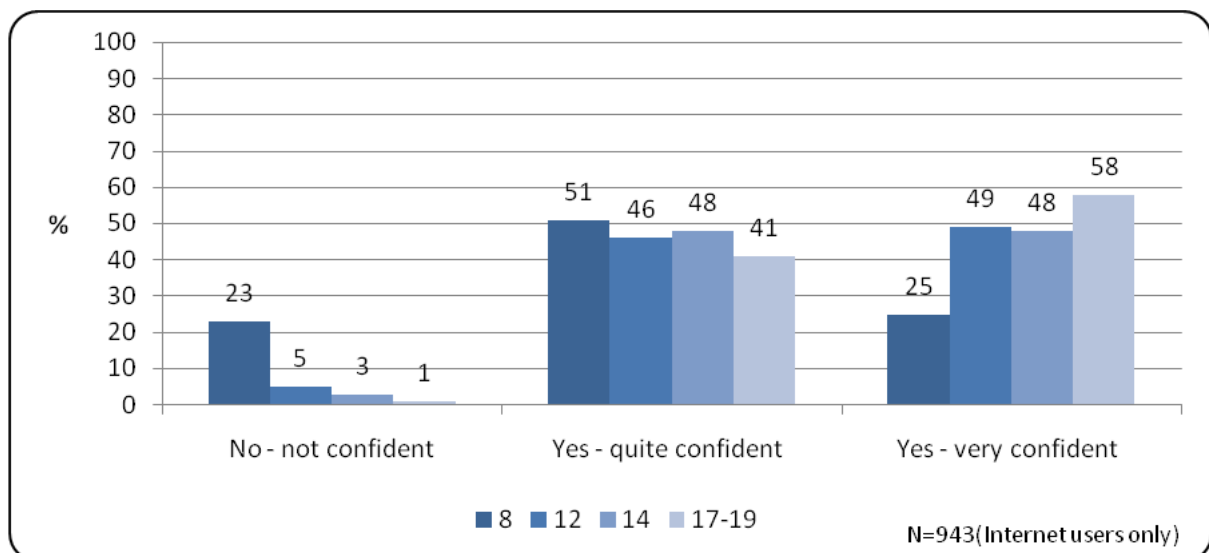


Figure 44: Confidence in keeping safe on the internet by age (% of respondents)

As demonstrated in Figure 45, the majority of young people have support in staying safe online. In addition to young people being relatively self-reliant, adults such as teachers (identified by 80 per cent of respondents) and parents (76 per cent) help young people stay safe online.

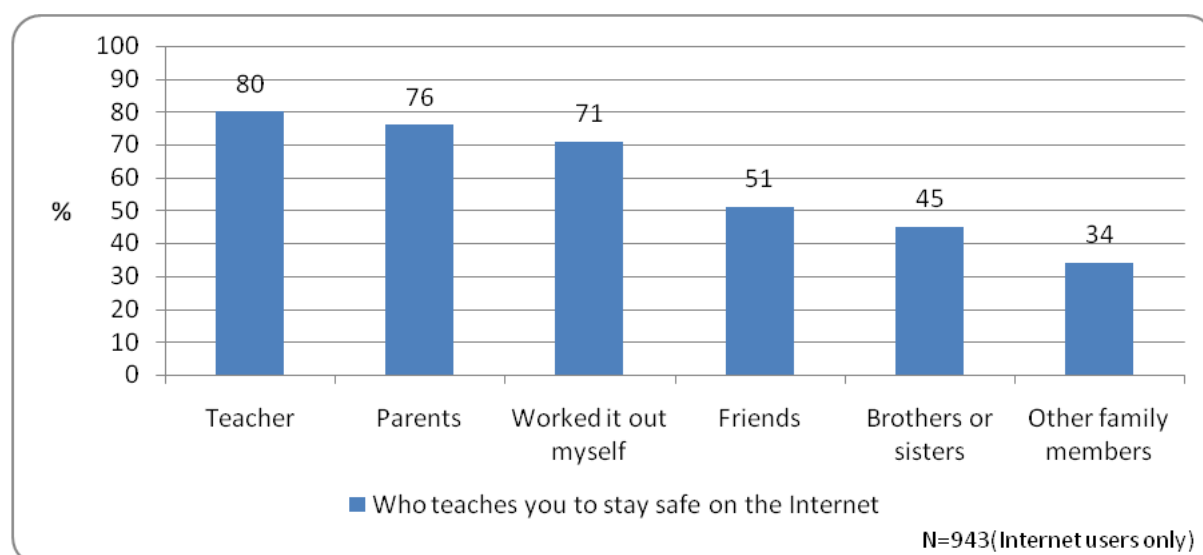


Figure 45: Who teaches you to stay safe on the internet? (% of respondents)

Summary: safe use of technology

The findings reported in this section provide a relatively positive picture of young people using technology safely.

Young people appear to be relatively careful about the information they give out online – both through what they tell people they meet online whom they did not know before and the control they place on who can see their social networking sites.

Young people are aware of the risks online. Getting a computer virus is the biggest safety concern for internet users, suggesting that everyday risks are of more immediate concern to young people. Indeed, although any cyber-bullying is significant, only 10 per cent of respondents reported that they had either been sent or someone had posted an upsetting message about them or picture of them on a computer or mobile phone, and this group did tend to talk to someone about it.

In general, young people are relatively confident about keeping themselves safe online, although eight-year-olds tend to be more concerned than older age groups are. While young people often work out how to stay safe on the internet by themselves, teachers and parents are also important sources of support. Indeed, given that confidence to be safe and ability to be safe are not necessarily the same thing, support from adults may be particularly important.

Attitudes and perceived skills

Survey participants were asked a range of questions to explore their attitudes towards technology, their perceived skills in using technology and their attitudes and beliefs about learning. The findings from these items are summarised in the three sections below.

Technological attitudes

In the survey, participants were asked a range of questions to obtain a picture of the general attitudes that young people have towards technology, and their attitudes towards the importance of technology for learning new things.

General attitudes towards technology

In general, the majority of young people hold positive attitudes towards technology. All survey respondents were asked to indicate on a scale their agreement or disagreement with a number of statements about technology on a scale from 1 = strongly disagree to 5 = strongly agree. Of all young people, 85 per cent agreed or agreed strongly with the statement 'technology stops you being bored', 93 per cent with 'you enjoy using technology', 92 per cent with 'technology helps you to learn new things', and 83 per cent with 'technology is important in your life'.

From a factor analysis of the four items, one factor was identified that reflects general attitudes towards technology. The means of the four 'general attitudes towards technology' items were combined to create a single factor.

ANOVA was used to explore the effects of age and gender on young people's attitudes towards technology (Figure 46). There is a significant main effect of age: 8-year-olds hold less positive attitudes towards technology than 12-, 14- and 17- to 19-year-olds do. Girls have significantly less positive attitudes than boys do about technology. There is no significant interaction effect between the age of young people and their gender on attitudes towards technology.

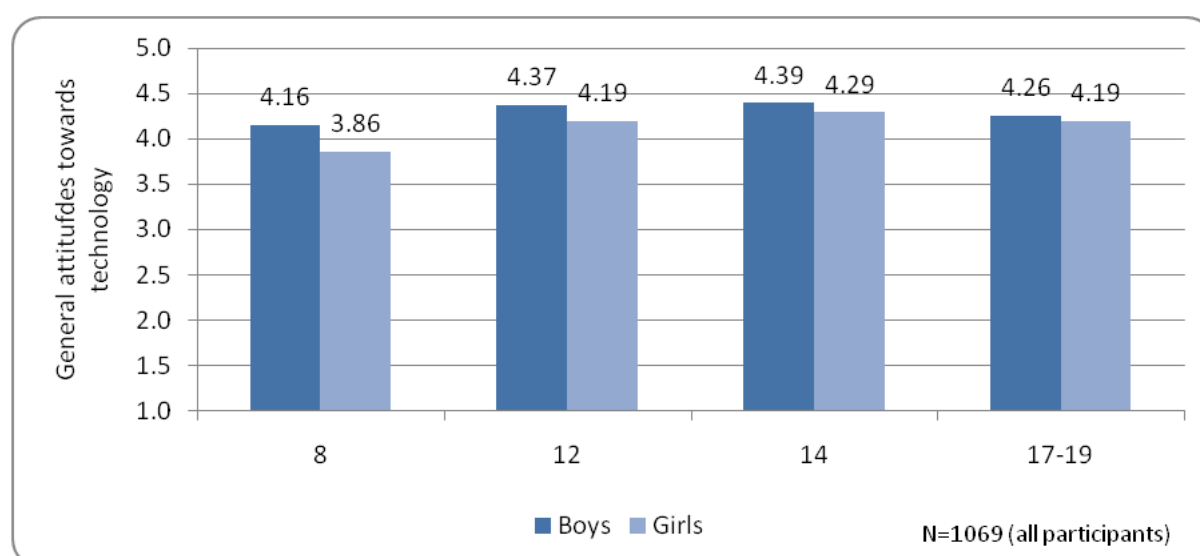


Figure 46: General attitudes towards technology by age and gender²⁰

Importance of technology for learning

Respondents were asked about how important they thought a range of technologies were for finding out or learning new things on a scale from 1= not important to 3 = very important. From a factor analysis of the data, three groups or types of technologies were identified: visual and auditory tools, computer and the internet, and print media.

The first factor, visual and auditory tools, contained five items associated with visual and auditory technologies: television, mobile, computer games, MP3 players and video cameras.

²⁰ This construct was developed from individual items where respondents were asked to indicate their agreement or disagreement with a number of statements about technology on a scale from 1 = strongly disagree to 5 = strongly agree. Thus the scale on the vertical axis gives an indication of the level of positive or negative attitudes towards technology.

The percentages of young people who viewed the different visual and auditory technologies as quite or very important for learning are shown in Figure 47. For all age groups, television is viewed as the most important auditory and visual tool, and video cameras the least. Eight-year-olds favour computer games, whereas 17- to 19-year-olds tend to favour mobile phones and MP3 players. Sixty-three per cent of 8-year-olds, 57 per cent of 12-year-olds, 46 per cent of 14-year-olds and 40 per cent of 17- to 19-year-olds think computer games are at least somewhat important for finding out or learning new things.

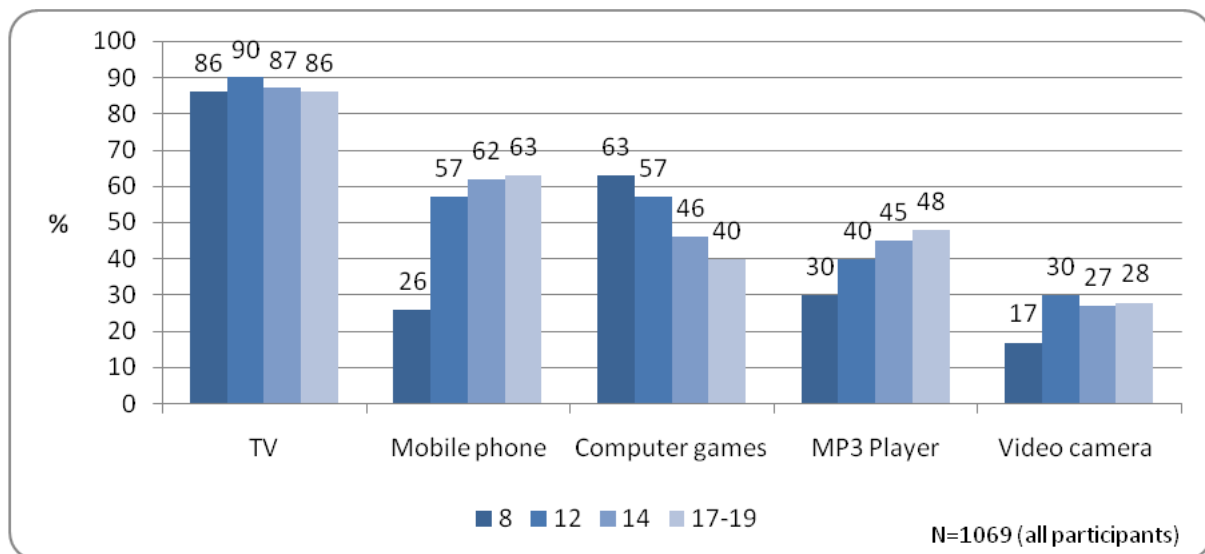
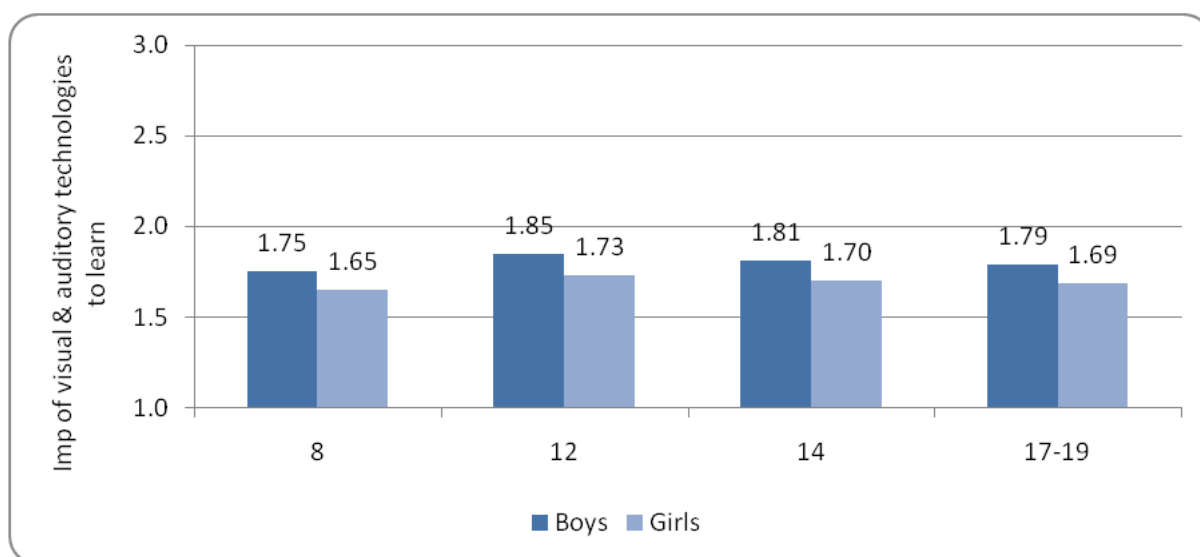


Figure 47: Importance of visual and auditory technologies to learn new things by age (% of respondents)

The means of the five 'importance of visual and auditory technologies to learn' items were combined to create a single factor.

ANOVA was used to explore the effects of age and gender on young people's views of the importance of visual and auditory technologies to learn new things (Figure 48). There is no significant main effect of age. Girls are less positive than boys are about the importance of visual and auditory technologies for learning. There is no significant interaction effect between the age of young people and their gender on attitudes towards visual and auditory technologies for learning.



N=1,069 (all participants).

Figure 48: Importance of visual and auditory technologies to learn new things by age and gender²¹

²¹ This construct was developed from individual items where participants were asked how important they thought a range of technologies are for finding out or learning new things on a scale from 1 = not important to 3 = very important. Thus the scale on the vertical axis gives an indication of the perception of importance of visual and auditory technologies for learning.

The second 'importance of technology for learning' factor, computers and the internet, contained two items: computer or laptop, and the internet.

In general, computers and the internet are seen by the majority of young people as important for learning. Twelve- and 14-year-olds are more likely than 8- and 17- to 19-year-olds to view computers and the internet as important for learning and finding out new things. For example, 76 per cent of 8-year-olds, 95 per cent of 12-year-olds, 96 per cent of 14-year-olds and 91 per cent of 17- to 19-year-olds think the internet is at least somewhat important for learning (Figure 49).

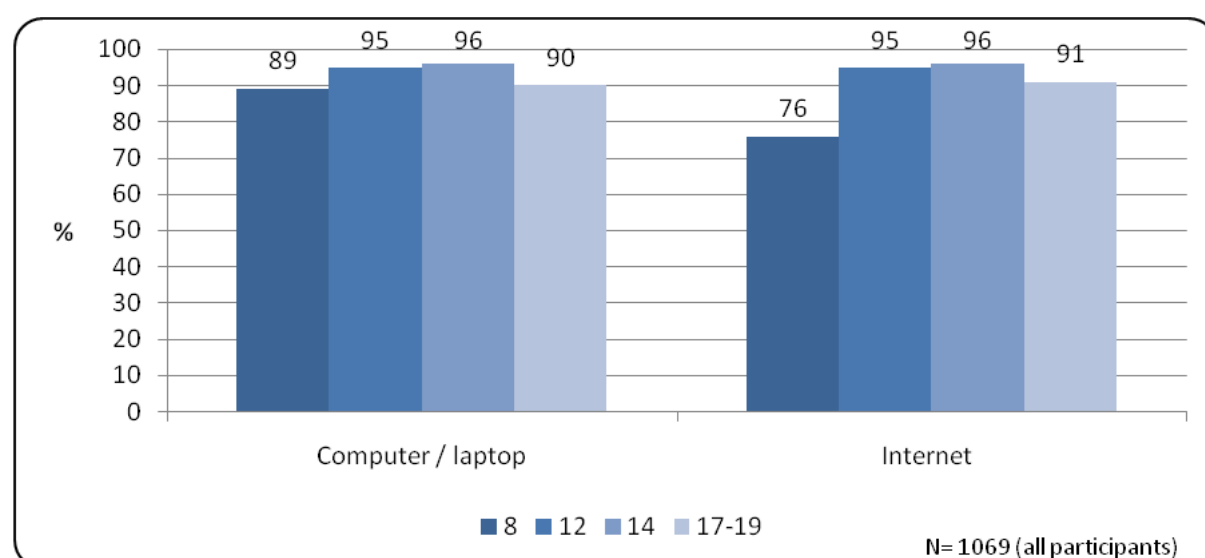


Figure 49: Importance of computers and the internet to learn by age (% of respondents)

The means of the two 'importance of computers and the internet to learn' items were combined to create a single factor. .

ANOVA was used to explore the effects of age and gender on young people's attitudes towards computers and the internet to learn new things (Figure 50). Eight-year-olds rate computers and the internet as less important for learning new things than 12-, 14- and 17-19 year olds do. Gender is not significant. There is no significant interaction effect between the age of young people and their gender on ratings of the importance of computers and the internet for learning new things.

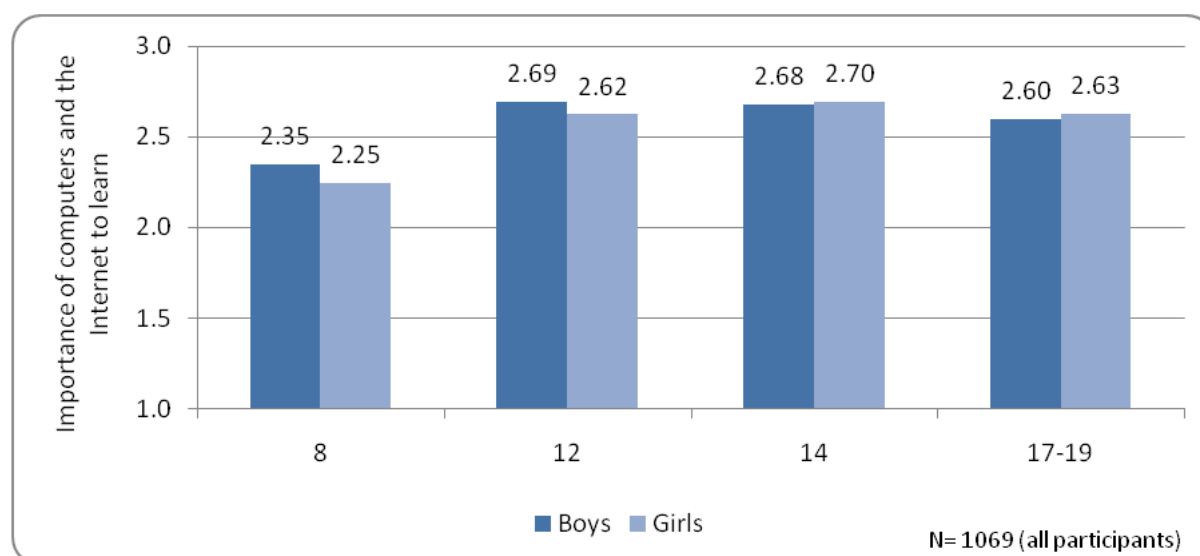


Figure 50: Importance of computers and the internet to learn by age and gender²²

²² This construct was developed from individual items where participants were asked how important they think a range of technologies are for finding out or learning new things on a scale from 1 = not important to 3 = very important. Thus the scale on the vertical axis gives an indication of the how important computers and the internet are for learning.

The third 'importance of technology for learning' factor, print media, contained two items: books, and newspapers and magazines.

In general, the majority of young people see print media as important for learning. Books are seen as more important by 8-year-olds than by other age groups, whereas 17- to 19-year-olds are more likely than other age groups to see newspapers and magazines as useful for learning new things. For example, 93 per cent of 8-year-olds, 87 per cent of 12-year-olds, 84 per cent of 14-year-olds and 79 per cent of 17- to 19-year-olds think books are at least somewhat important for learning (Figure 51).

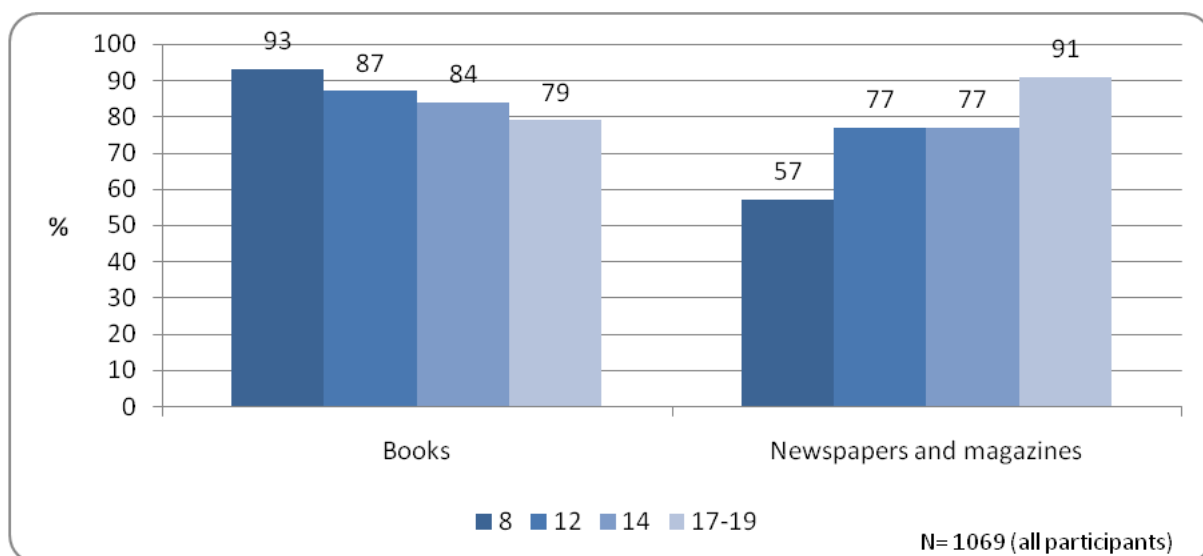


Figure 51: Importance of print media to learn by age (% of respondents)

The means of the two 'importance of print media to learn' items were combined to create a single factor.

ANOVA was used to explore the effects of age and gender on young people's attitudes towards print media to learn new things (Figure 52). There is no significant main effect of age on attitudes towards print media for learning. Girls tend to rate the importance of print media more highly than boys do. There is no significant interaction effect between the age of young people and their gender on attitudes towards print media for learning.

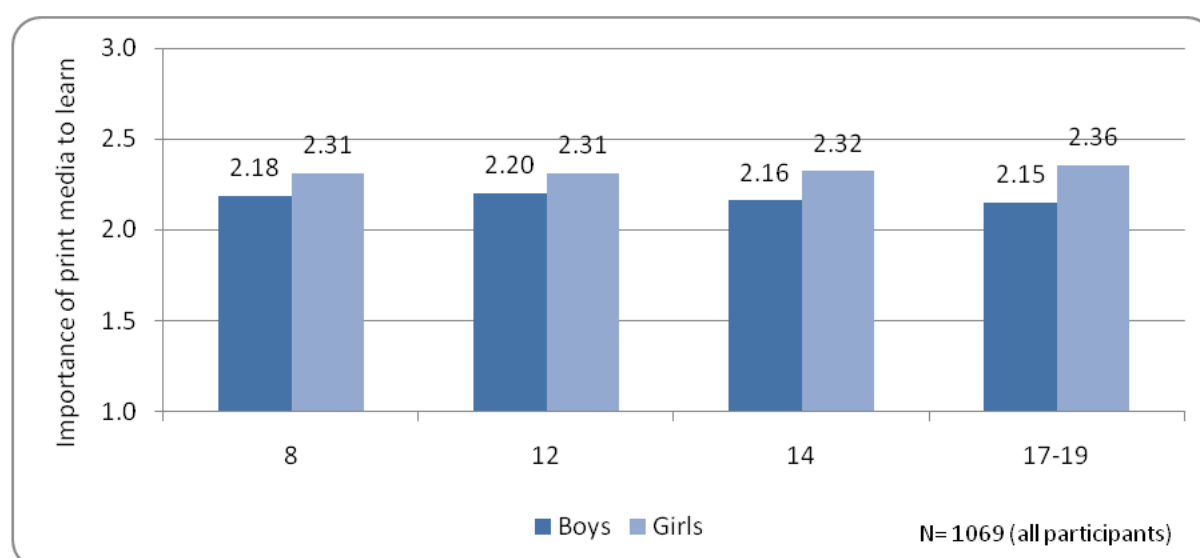


Figure 52: Importance of print media to learning by age and gender²³

Perceived skills in using technology

While a survey cannot accurately measure specific skills, it can measure perceived skills. Perceived skills are important because they relate to the kinds of activities people use technology for. In this survey, participants were asked a range of questions to measure perceptions about general technical skills, skills to use the internet and online information skills, and the extent to which they engage in a problem-solving approach to using technology. Each of these is discussed below.

²³ This construct was developed from individual items where participants were asked how important they think a range of technologies are for finding out or learning new things on a scale from 1 = not important to 3 = very important. Thus the scale on the vertical axis gives an indication of the importance of print media for learning.

General technical skills

Survey respondents were asked, if they use a specific technology, to rate on a scale how good they are at using it on a scale from 1 = bad to 4 = excellent. Figure 53 summarises by age the percentage of young people who rate themselves as good or excellent at using different technologies.

In general, young people rate themselves quite highly in their ability to use technologies, although there are some differences within age groups. For example, 8-year-olds tend to rate themselves less highly, particularly for computers, internet and mobile phone use, than other age groups do, but rate themselves more highly than those aged 17–19 do on using computer or console games. Fifty-two per cent of 8-year-olds, 83 per cent of 12-year-olds, 89 per cent of 14-year-olds and 85 per cent of 17- to 19-year-olds who use computers say they are good or excellent at using computers. In contrast, 80 per cent of 8-year-olds, 81 per cent of 12-year-olds, 83 per cent of 14-year-olds and 66 per cent of 17- to 19-year-olds who use computer or console games say they are good or excellent at using them.

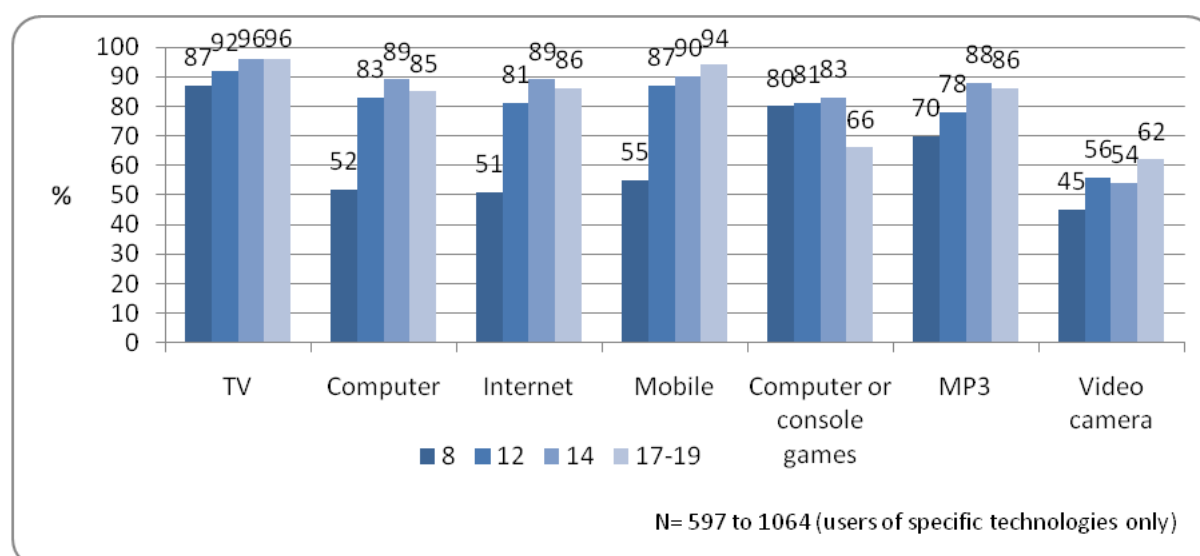


Figure 53: Self-rated competence in using technologies by age (% of respondents who rate their skills as good or excellent)

Skills to use the internet

Internet users were asked, if they had carried out specific activities, to rate on a scale their skills on four items relating to their perceived ability to use the internet. The percentage of internet users who rate themselves as good or excellent at carrying out the four specific online tasks is summarised in Figure 54.

In general, 8-year-old internet users tend to rate themselves less highly at carrying out the four specific online tasks than other age groups do, and 17- to 19-year-olds rate themselves the most highly on these tasks. For example, 38 per cent of 8-year-old, 76 per cent of 12-year-old, 83 per cent of 14-year-old and 90 per cent of 17- to 19-year-old internet users rate their ability to send an instant message as good or excellent.

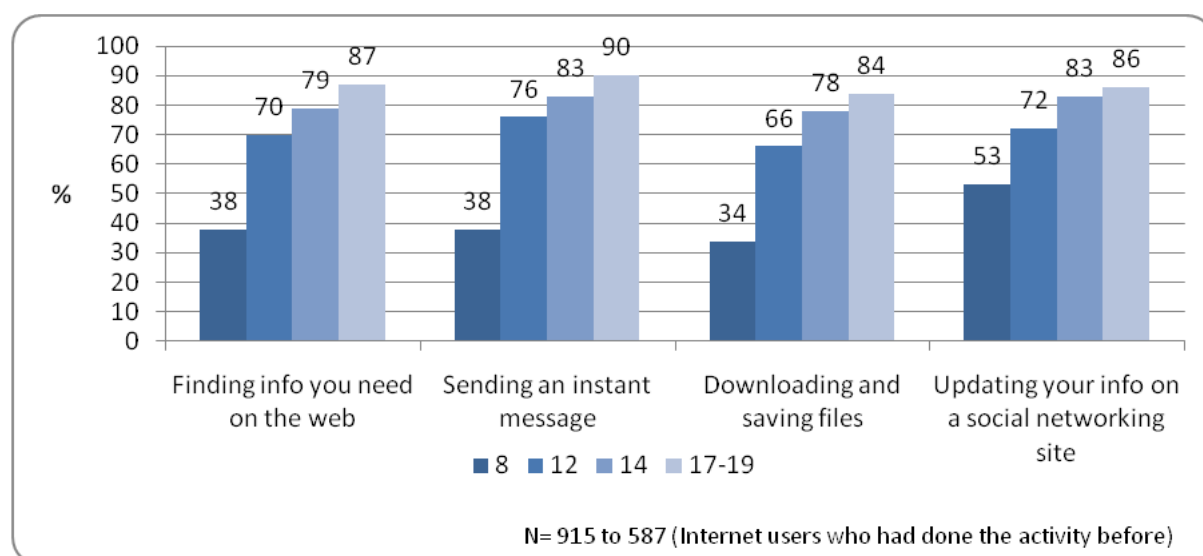


Figure 54: Perceived ability to use the internet by age (% of respondents who rate their skills as good or excellent)

As a result of the factor analysis, the means of the four 'perceived ability to use the internet' items were combined to create a single factor.

ANOVA was used to explore the effects of age and gender of internet users on their perceived ability to use the internet (Figure 55). There is a significant main effect of age: 8-year-olds rate themselves as having the least internet ability and 17- to 19-year-olds the most. Gender is also significant: overall, male internet users rate their ability to use the internet significantly more highly than female internet users do. There is no significant interaction effect between the age of internet users and their gender on perceived ability to use the internet.

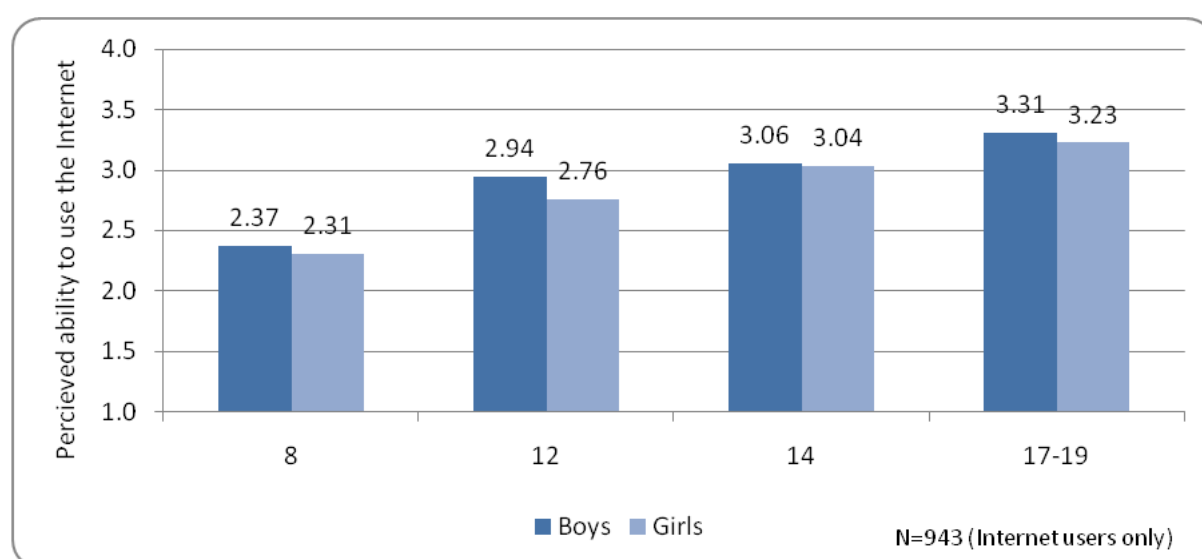


Figure 55: Perceived ability to use the internet by age and gender²⁴

Online information-seeking skills

Internet users aged 12, 14 and 17–19 were asked to rate on a scale their agreement with four items about finding information online. Of this group, 88 per cent agree or agree strongly with the statement 'you can find things quickly', 87 per cent with 'you can find things easily', 71 per cent with 'you can find things you can trust', and 90 per cent with 'the information you find online is useful'.

²⁴ This construct was developed from individual items where young people were asked to rate their skills on a scale from 1 = poor to 4 = excellent, and a construct called 'perceived ability to use the internet' was developed from these individual items. Thus the vertical axis gives an indication of perceived level of ability to use the internet.

After conducting factor analysis, the means of the four 'perceived online information-seeking ability' items were combined to create a single factor

ANOVA was used to explore the effects of age and gender on young people's perceived online information-seeking ability for the three oldest age groups (Figure 56). There is a significant main effect of age on perceived skills to find information online: 12-year-olds rate their online information-seeking ability significantly lower than those aged 17–19 do. Gender is also significant: male internet users rate their ability to find information online significantly higher than female internet users do. There is no significant interaction effect between the age of internet users and their gender on perceived online information-seeking ability.

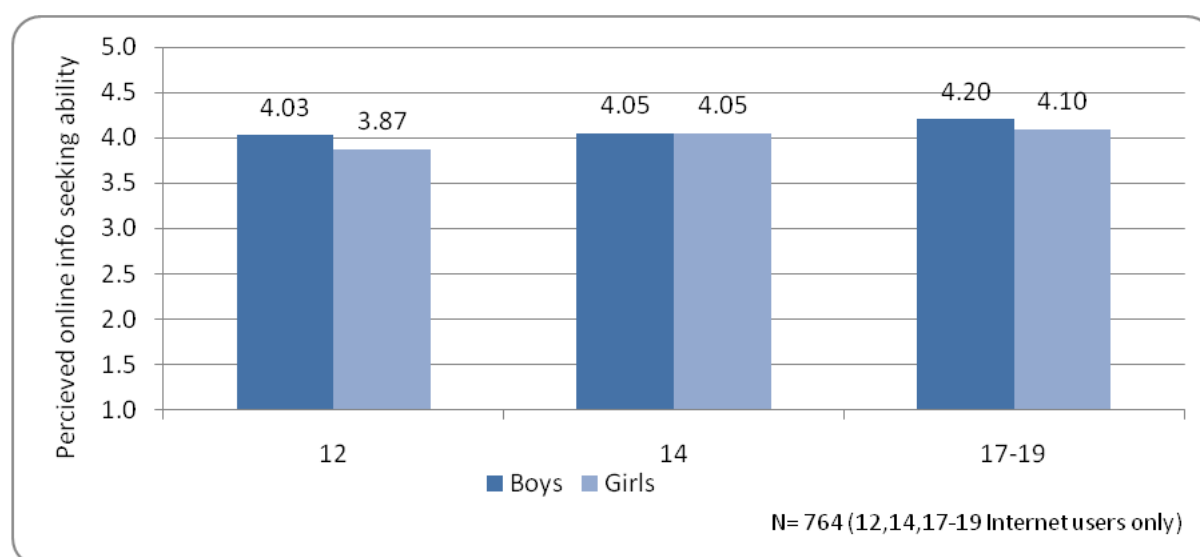


Figure 56: Perceived online information-seeking ability by age and gender²⁵

Using a problem-solving approach to technology

The survey asked all participants to rate on a scale their agreement with five statements about what they do when trying to understand how to use a computer or some other electronic technology or do something new on the computer or some other electronic technology on a scale from 1 = disagree strongly to 5 = agree strongly. The questions were designed to measure the extent to which young people have a problem-solving approach to technology or rely on others for help. Of all young people, 74 per cent agree or agree strongly with the statement 'you try to figure it out for yourself', 78 per cent with 'you ask someone for help', 61 per cent

²⁵ On the original items that make up this construct, participants were to rate their agreement on a scale from 1 = disagree strongly to 5 = agree strongly. Thus the scale on the vertical axis gives an indication of learners' perceived online-information-seeking ability.

with 'you often get frustrated', 37 per cent with 'you look on the internet or in a manual for help', and 70 per cent with 'you try lots of things to see what works'.

After conducting factor analysis of the five statements, two – 'you ask someone for help' and 'you often get frustrated' – were removed from the analysis. The means of the remaining three 'problem-solving approach to using technology' items were combined to create a single factor.

ANOVA was used to explore the effects of age and gender on young people's problem-solving approach to technology (Figure 57). There is a significant main effect of age: 8-year-olds are the least likely to apply a problem-solving approach to technology, and 17- to 19-year-olds the most likely. Boys are significantly more likely than girls to exhibit a greater problem-solving approach. There is no significant interaction effect between the age of young people and their gender on taking a problem-solving approach to technology.

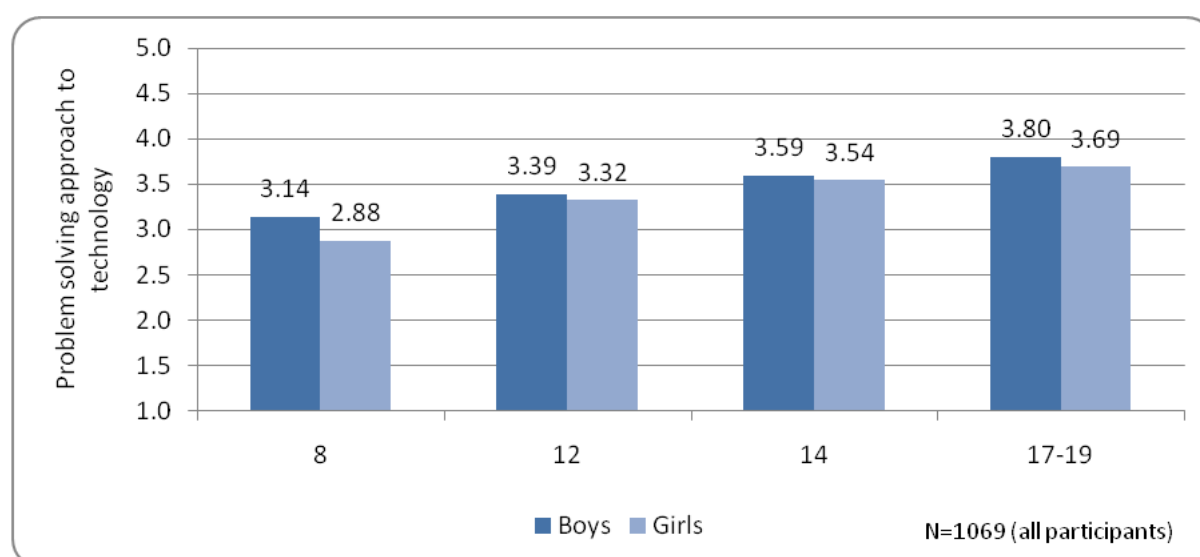


Figure 57: Problem-solving approach to technology by age and gender²⁶

Attitudes and beliefs about learning

When investigating the use of technologies for learning outside school, it is also useful to explore a person's attitude to learning. In the survey, this was measured in two main ways: enjoyment of learning and beliefs in ability to do well in school.

²⁶ On the original items that make up this construct, participants were to rate their agreement on a scale from 1 = disagree strongly to 5 = agree strongly. Thus the scale on the vertical axis gives an indication of the extent to which learners employ a problem-solving approach to technology.

Enjoyment of learning

Survey participants aged 12, 14 and 17–19 were asked to rate on a scale their agreement or disagreement with five statements about their enjoyment of learning on a scale from 1= disagree strongly to 5=agree strongly. Most of the young people in the three age groups are positive about learning new things; 81 per cent agreed or agreed strongly with the statement 'you learn new things on your own just because you want to', 87 per cent with 'you enjoy learning new things', 84 per cent with 'you like the opportunity to discover something new', 80 per cent with 'you are good at learning new things', and 73 per cent with 'you find it easy to understand new things'.

As a result of the factor analysis, the means of the five 'enjoyment of learning' items were combined to create a single factor.

ANOVA was used to explore the effects of age and gender of young people on their enjoyment of learning (Figure 58). There is no significant main effect of age or gender. There is also no significant interaction effect between the age of young people and their gender on enjoyment of learning.

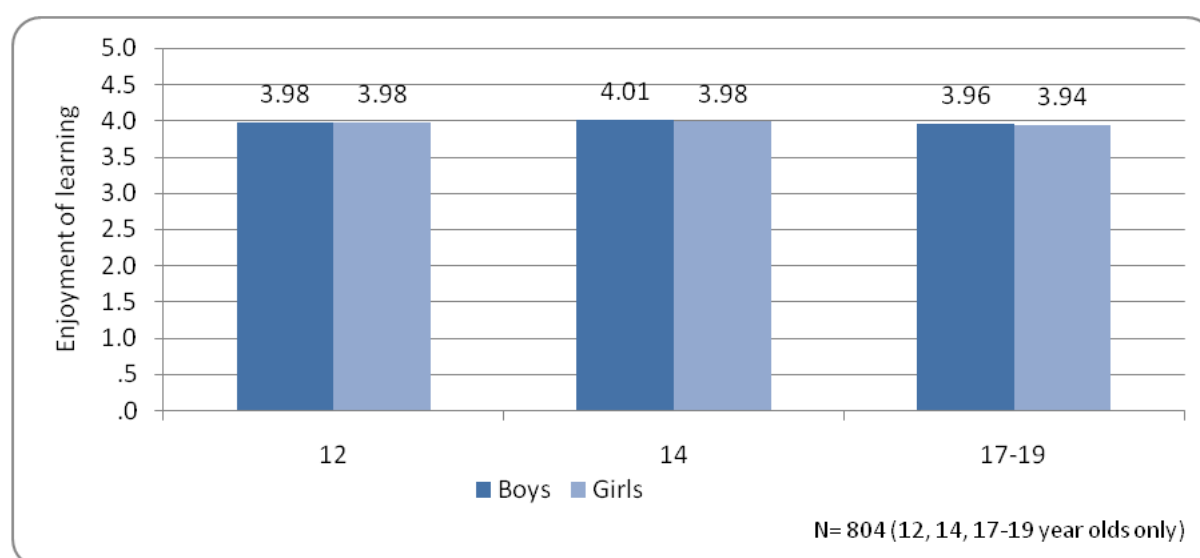


Figure 58: Enjoyment of learning by age and gender²⁷

Ability to do well in school

All participants who were still in formal education were asked to rate on a scale their agreement with four statements to measure their views about their ability to do well at school or college on a scale from 1 = disagree strongly to 5 = agree strongly.

²⁷ On the original items that make up this construct, participants were to rate their agreement on a scale from 1 = disagree strongly to 5 = agree strongly. Thus the scale on the vertical axis gives an indication of learners' level of enjoyment of learning.

Overall, the results were positive: 90 per cent agree or agree strongly with the statement 'you expect to do well in school, college or university this year', 96 per cent with 'if you try hard you believe you can do good work', 94 per cent with 'it is important to you that you do well in school, college or university', and 84 per cent with 'when you are taught something that doesn't make sense you spend time trying to understand it'.

As a result of the factor analysis, the means of the four 'belief in ability to do well at school, college or university' items were combined to create a single factor.

ANOVA was used to explore the effects of age and gender on young people's beliefs about doing well at school (Figure 59). Seventeen- to 19-year-olds' confidence about doing well at school is significantly higher than 8-, 12- and 14-year-olds' confidence; this probably reflects differences between those in compulsory and post-compulsory education. Gender is not significant. There is also no significant interaction effect between the age of young people and their gender on belief in ability to do well.

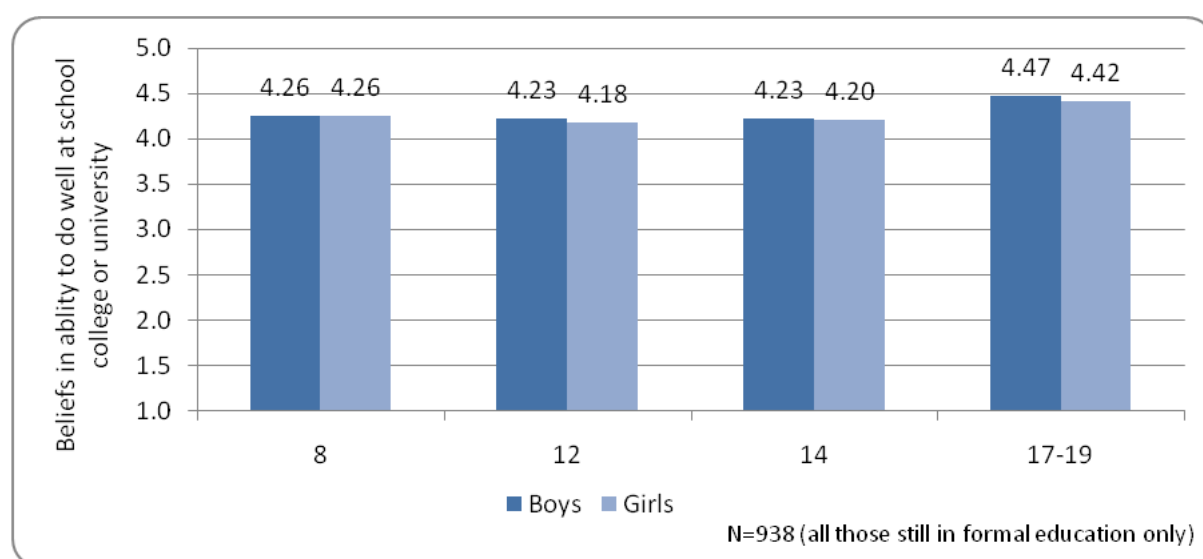


Figure 59: Belief in ability to do well at school, college or university by age and gender²⁸

Summary: attitudes and perceived skills

In general, young people hold positive attitudes about technology and tend to view the internet, books and magazines, and visual and auditory tools as important for learning.

²⁸ On the original items that make up this construct, participants were to rate their agreement on a scale from 1 = disagree strongly to 5 = agree strongly. Thus the scale on the vertical axis gives an indication of learners' level of belief in their ability to do well at school.

Age and gender are important in understanding young people's attitudes towards technology. For example, girls tend to see print media as more important for learning than boys do, and 8-year-olds rate computers and the internet as less important for learning new things than 12-, 14- and 17- to 19-year-olds do.

Young people rate themselves quite highly in their ability to use technologies, although there are gender and age differences. With the exception of using computer and console games, those from the younger age groups rate themselves less highly in their ability to use technologies than other age groups do. Boys are also more likely to rate their internet skills more highly than girls do. However, the extent to which boys are, in fact, more skilled or just more confident remains an open question. An important aspect of belief about the ability to use technologies is the extent to which someone employs a problem-solving approach; again, boys and those belonging to the older age groups are more likely to employ a problem-solving approach to technology.

When thinking about engaging learners, their attitudes towards learning, and their confidence as learners are important. The results from the survey are positive: it seems that 12-, 14- and 17- to 19-year-olds do tend to enjoy learning new things, and the majority, in particular 17- to 19-year-olds, believe they can do well in school, college and university.

In terms of their attitudes and perceived skills, young people, particularly those aged 14 and 17–19, are well placed to take advantage of technology to enhance learning. Indeed, attitudes and perceived skills do influence use of technologies (see the section on individuals and networks below). However, the extent to which young people have the skills to use technology is addressed within the qualitative aspects of this research.

Quality of access to technology

Three aspects of quality of access to technology were explored: places of internet access, the quality of access to technologies within the home environment, and personal ownership of technologies.

Internet users were asked where they had accessed the internet in the past month; participants could select as many places as applied. The location of accessing the internet is summarised by age group in Figure 60. Home, another person's home, and school or college are the most popular places for access. In the month preceding the survey, 94 per cent of 8-year-old, 97 per cent of 12-year-old, 97 per cent of 14-year-old and 56 per cent of 17- to 19-year-old internet users accessed the internet from school, college or university. The significant drop in the 17- to 19-year-old age group is because 53 per cent of internet users in that age group are no longer in formal education.

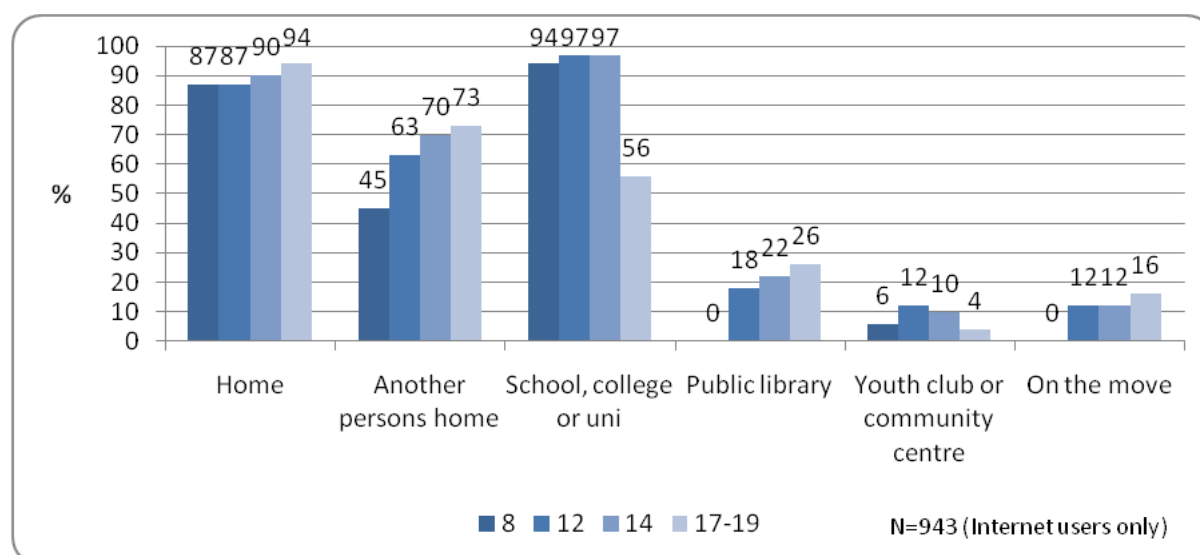


Figure 60: Places of internet access by age (% of respondents)

Participants were asked a number of questions about the technologies they have access to at home (computer and internet access is addressed separately below). In general, young people are likely to have a number of different technologies in their homes; television (97 per cent of respondents), DVD players (97 per cent) and radio (95 per cent) are the most popular technologies in the home, whereas camcorders (59 per cent) and webcams (49 per cent) are the least popular (Table 2).

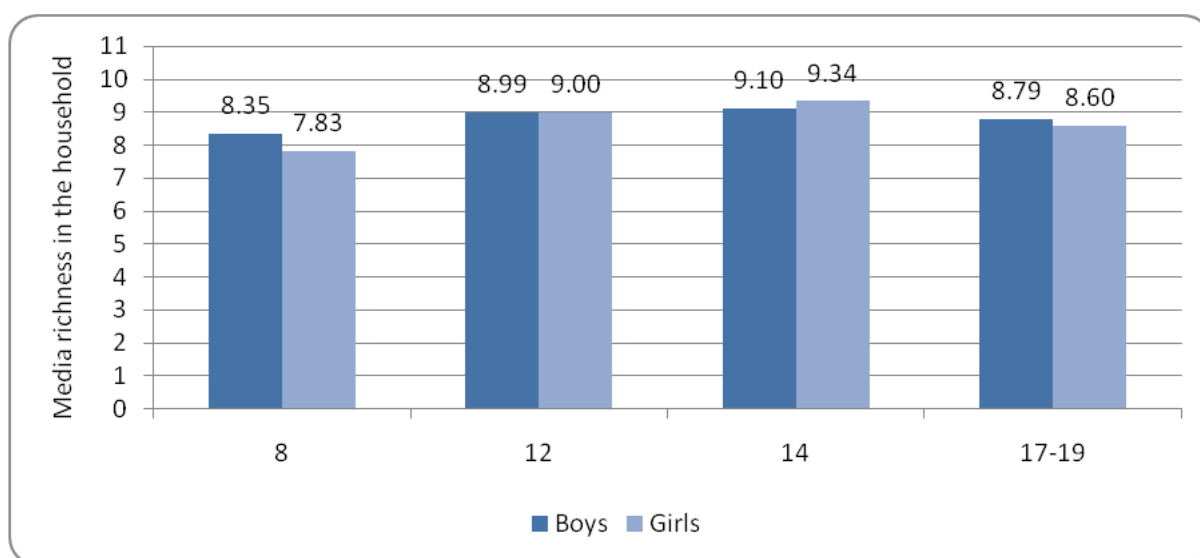
Table 2: Technologies in the homes of young people

Technology in home	Per cent who have this technology in their homes
Television	97
DVD player	97
Radio	95
Games console	86
Portable gaming device	83
Digital camera	83
Printer for computer	79
Way of recording TV	77
MP3 player	75
Camcorder or video camera	59
Webcam for computer	49

N= 1,069 (all users)

A measure of media richness in the household was created by summing the responses to the items shown in Table 2.

ANOVA was conducted to explore the effects of age and gender on media richness in the household (Figure 61). There is a significant main effect of age: 8-year-olds tend to have a lower measure of media richness in the household than 12-, 14- and 17- to 19-year-olds do; 14-year-olds have significantly higher levels of media richness in the home than 17- to 19-year-olds do. Gender is not significant. There is also no significant interaction effect between the age of young people and their gender on media richness in the household.



N=1,069 (all participants).

Figure 61: Media richness in the home by age and gender²⁹

²⁹ This measure has been created by summing up the eleven items shown in Table 2. Thus, the vertical access in Figure 61 gives us an indication of the amount of technology in the home (media richness).

When asked about working computers in the home, 87 per cent of young people have at least one computer. Figure 62 shows the numbers of computers in households by age of participant. Forty-two per cent of all survey participants have one working computer in the home, 26 per cent have two, 10 per cent have three, 4 per cent have four and 3 per cent have five or more. Age is important; for example, eight-year-olds are the most likely not to have a computer at home.

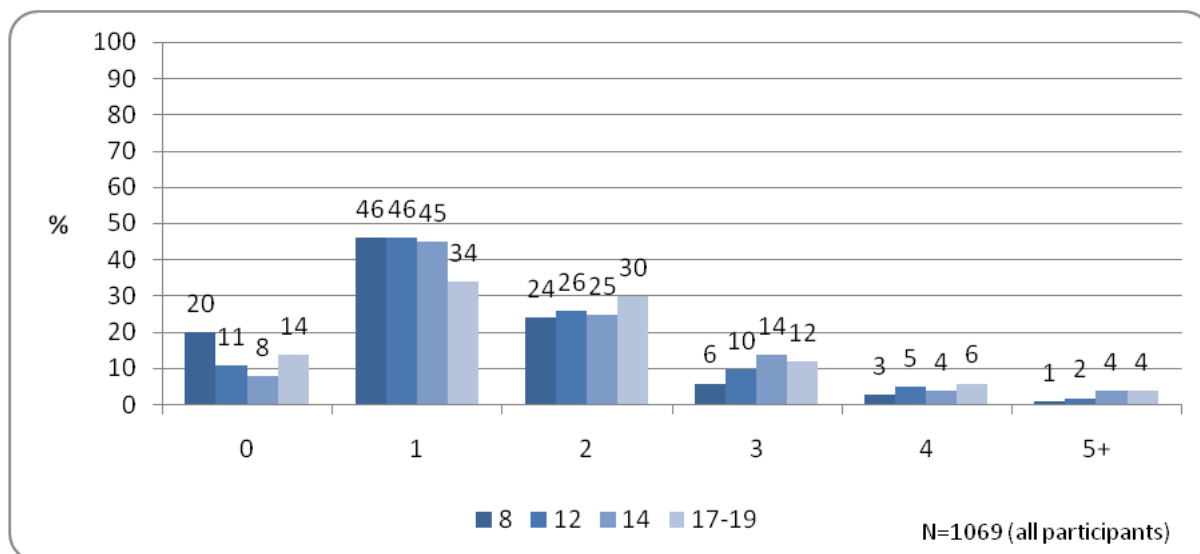


Figure 62: Number of computers in household by age (% of respondents)

Because a high proportion of young people do have computer access at home, the question of the quality of that access becomes more important. Participants who have computer access were therefore asked how often, when they want to use a computer, someone else is using it. In general, younger age groups seem to need to negotiate access to a home computer more often than those aged 17–19 do. Among participants with computer access at home, 86 per cent of 8-year-old, 79 per cent of 12-year-old, 74 per cent of 14-year-old and 57 per cent of 17- to 19-year-old computer users at least sometimes want to use a computer when someone else is using it (Figure 63).

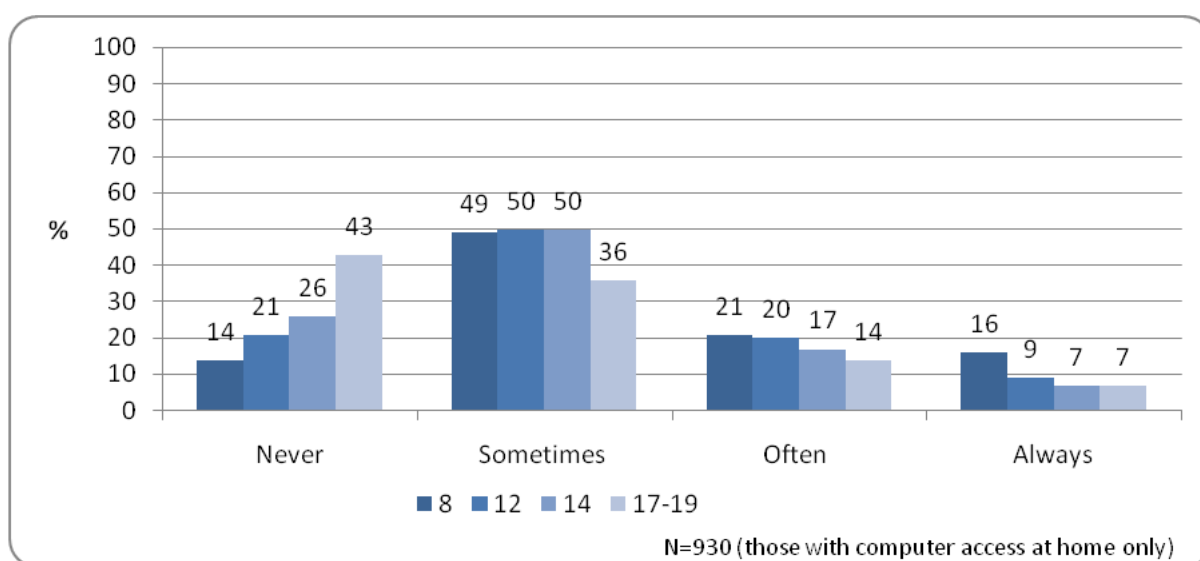


Figure 63: How often someone else is using a computer when you want to use it by age (% of respondents)

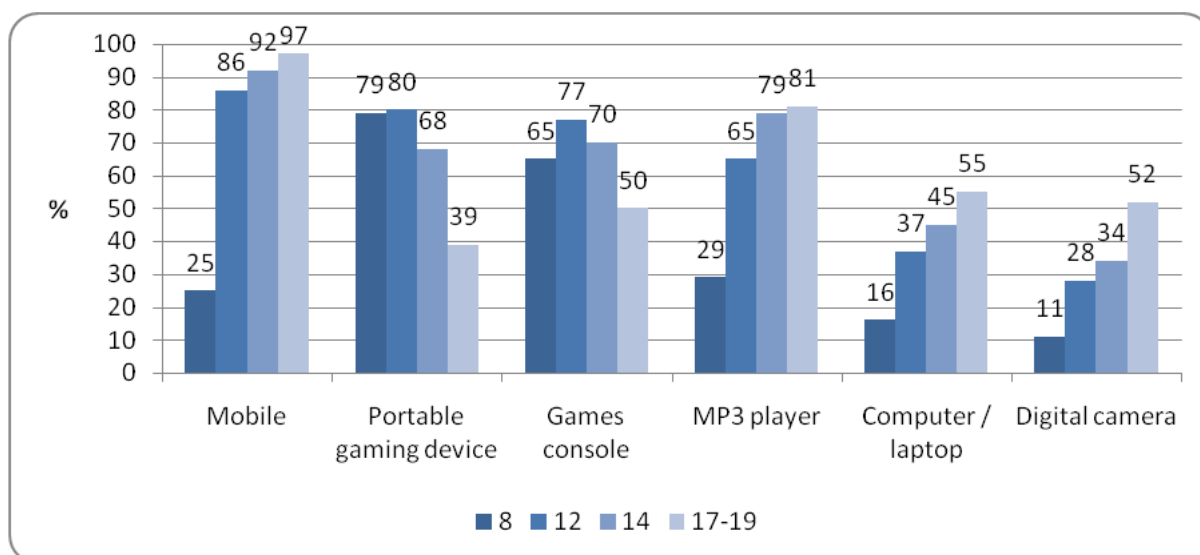
Of all users, 82 per cent have access to the internet at home. Thus the vast majority (95 per cent) of those with access to a computer at home also have internet access. Of the young people who have internet access at home, 38 per cent can go online in their bedrooms. Whether young people can use the internet in their bedrooms is related to age; for example, 13 per cent of 8-year-old, 40 per cent of 12-year-old, 34 per cent of 14-year-old and 64 per cent of 17- to 19-year-old boys who have internet access at home can go online in their bedrooms (Figure 64).



Figure 64: internet access in bedroom by age and gender (% of respondents)

Another related issue is personal ownership of different technologies by young people. All participants were asked what technologies they had personal access to. Among all respondents, 75 per cent have access to their own mobile phones, 66 per cent to their own portable gaming devices, 65 per cent to their own games consoles, 64 per cent to their own MP3 players, 39 per cent to their own computers or laptops, and 31 per cent to their own digital cameras.

Age is very important. For all technologies apart from gaming devices and consoles, those from the younger age groups are less likely than those from the older age groups to own a particular technology. For example, 16 per cent of 8-year-olds, 37 per cent of 12-year-olds, 45 per cent of 14-year-olds and 55 per cent of 17- to 19-year-olds have access to their own computers (Figure 65).



N=1,069 (all participants).

Figure 65: Personal ownership of technologies by age (% of respondents)

Summary: quality of access to technology

The majority of young people tend to have relatively good access to a range of technologies in their homes, including computers and internet access. Interestingly, once we look beyond simple access, for example whether someone has a computer in the home, there is significant diversity in the quality of home access. This diversity can be seen, for example, in terms of the number of computers in the home, personalised access to technologies, internet access in bedrooms, and the amount of negotiation required for a young person to use a computer.

Age is a significant factor in quality of access to technology; for example, eight-year-olds are the least likely to have a computer at home, tend to need to negotiate access to a home computer more often, are less likely to be able to go online in their bedrooms, and are less likely to have personal access to specific technologies.

As will be seen in the section on individuals and networks, quality of access is related to the frequency with which young people use technologies for a range of purposes, and therefore is very important. The level of home access to technologies is important in understanding use of technologies, but so is the quality of that home access.

Family, peer, school and work networks

An important aspect of understanding young people's uses of technology is to understand the young people's immediate context – specifically in terms of their parents, friends, school and (for some 17- to 19-year-olds) their work. Survey participants were asked a number of questions about their family, peer, school and work networks, and the results are presented in the sections below.

Parents

Participants were asked a range of items designed to measure parental styles in general and in relation to technology and learning. To measure parental style in general and in relation to technology, participants were asked to rate on a scale how often their parents did certain things on a scale from 0 = never, 1 = sometimes, 2 = often and 3 = always. Factor analysis on the 'parental style' items led to four factors: two of which centre on parental styles in general (parental support and parental control) and two that focus on control over technologies (control over online content and control over time spent using technologies).

Parental styles

As noted above, two factors were identified that reflect general parenting styles: parental control and parental support.

Parental control was made up of the means of four items about parental styles; participants were asked 'how often do your parents: give you clear rules; tell you exactly what you can and cannot do; let you know exactly what they expect; and keep you in line?' Of those who still live with their parents, 70 per cent said their parents give them clear rules often or always, 70 per cent that their parents tell them exactly what they can or cannot do, 75 per cent that their parents let them know exactly what they expect of them and 77 per cent that their parents keep them in line.

The means of the 'parental control' items were combined to create a single factor.

ANOVA was conducted to explore the relationship between age and gender of young people and parental control (Figure 66). There is a significant main effect of age: those from younger age groups are significantly more likely than older age groups to rate their parents as exerting control more often. Gender is not significant and there is no significant interaction effect between the age of young people and their gender on parental control.

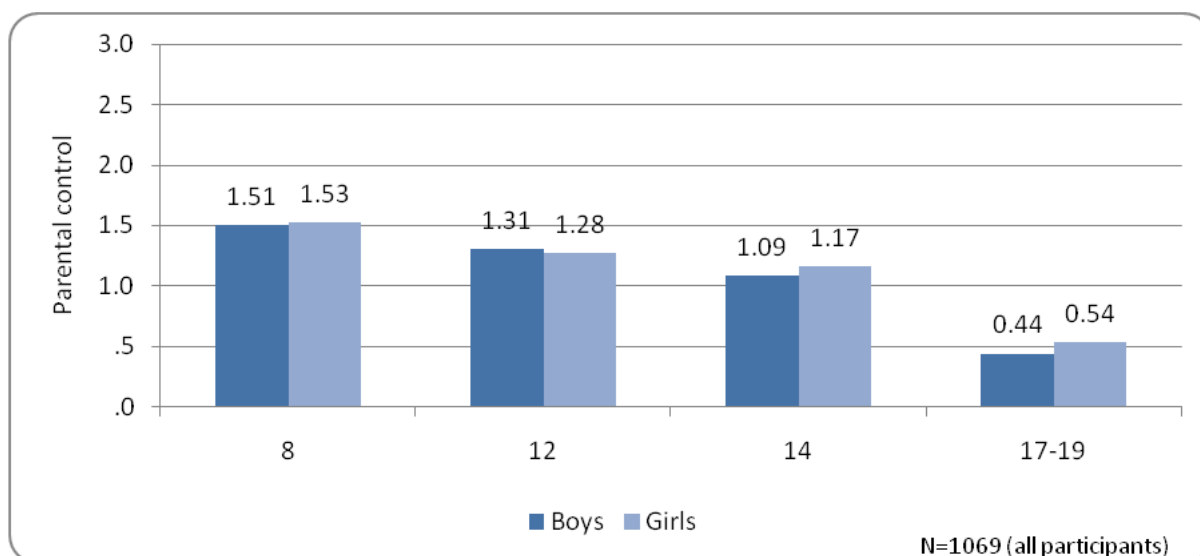


Figure 66: Parental control by age and gender³⁰

The second factor reflecting general parenting styles, parental support, was made up of four items; participants were asked 'how often do your parents listen to you or listen to your ideas, ask for your opinion, help if you have a problem, and understand you well?'

Sixty-four per cent of respondents stated their parents listen to them or to their ideas often or always, 53 per cent that their parents ask them for their opinions often or always, 84 per cent that their parents help them often or always if they have a problem, and 76 per cent that their parents understand them well often or always.

The means of the 'parental support' items were combined to create a single factor.

ANOVA was conducted to explore the relationship between age and gender of young people and parental support (Figure 67). There is a significant main effect of

³⁰ As noted above, participants were asked to rate the frequency with which their parents did certain things on a scale from 0= never to 3= always. The vertical access in Figure 66 gives us an indication of the level of parental control (from the perspective of the child).

age on parental support: 8-year-olds and 12-year-olds are significantly more likely than those aged 14 and 17–19 to rate their parents as supportive. Girls are more likely than boys to view their parents as supportive. There is no significant interaction effect between the age of young people and their gender on parental support.

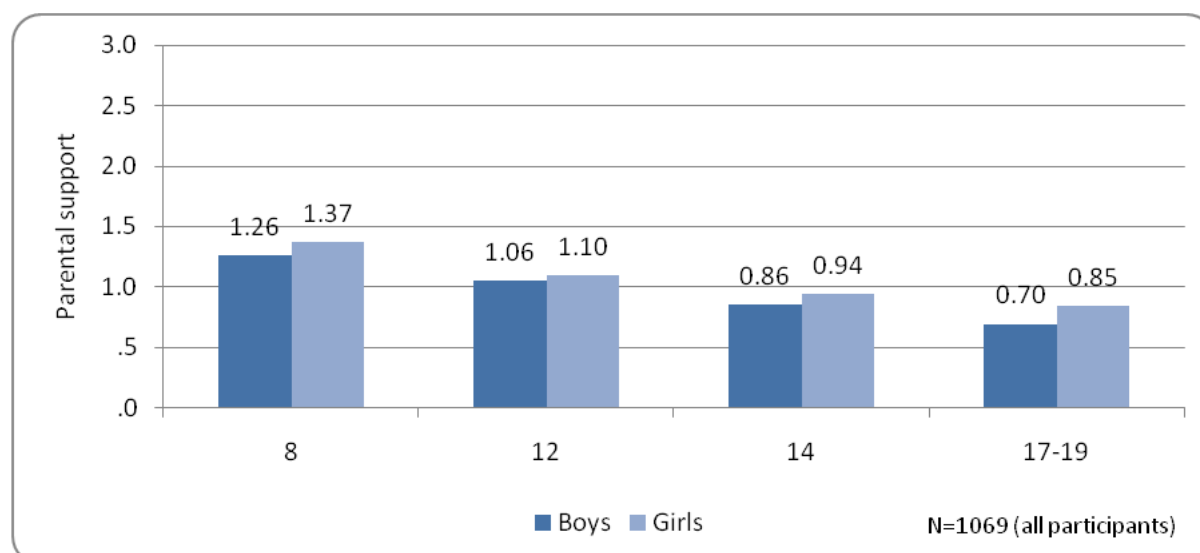


Figure 67: Parental support by age and gender³¹

Parental control over technology

As noted above, two factors were identified that reflect parents' control over their children's use of technology: control over time spent using technologies, and control over online content.

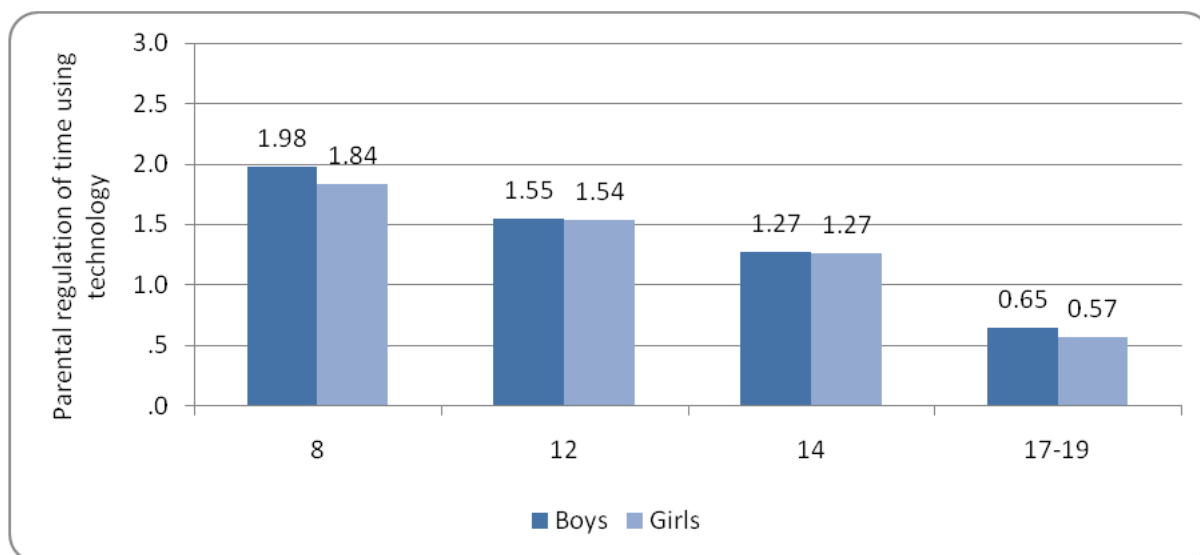
Parental regulation of time using technology was made up of six items. Participants were asked 'how often do your parents set rules about the following: how much time you spend on the phone, how much time you spend watching television, how much time you spend on the computer, the kinds of videos or television programmes you watch, the kinds of computer games you play, and how much time you spend playing computer games?' Sixty per cent of participants reported that their parents set rules at least sometimes about how much time they spend on the phone, 72 per cent about how much time they spend watching television, 74 per cent about how much time they spend on the computer, 73 per cent about the kinds of videos or television programmes they may watch, 63 per cent about the kinds of computer games they

³¹ This construct was developed from items where participants were asked to rate the frequency with which their parents did certain things on a scale from 0 = never to 3 = always. Thus the vertical access gives an indication of the frequency with which parents support their child in their learning, from the perspective of the child.

may play, and 70 per cent about how much time they spend playing computer games.

The means of the 'parental regulation of time using technology' items were combined to create a single factor.

ANOVA was conducted to explore the relationship between age and gender of young people and parental regulation of time using technology (Figure 68). There is a significant main effect of age on the frequency of parental regulation of time using technology. Younger age groups are significantly more likely than older age groups to report that their parents regulate their use of technology more often. Gender is not significant and there is no significant interaction effect between the age of young people and their gender on parental regulation of time using technology.



N=1,037 (all participants who live with parents).

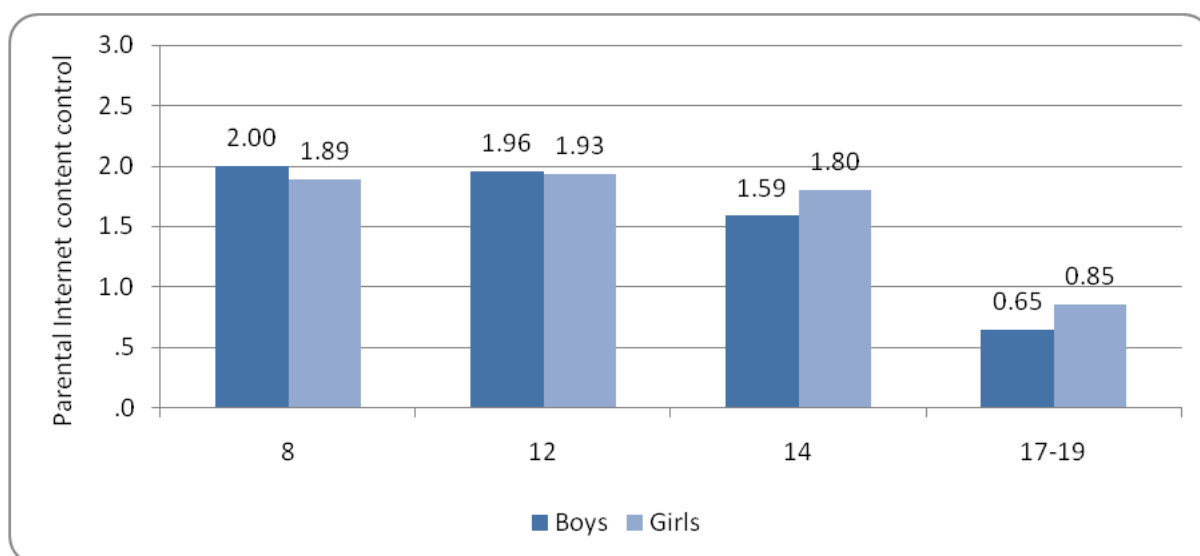
Figure 68: Parental regulation of time using technology³²

The other factor reflecting parents' control over their children's use of technology was parental internet content control, which was made up of three items about the use of the internet. Of respondents, 71 per cent stated their parents set rules at least sometimes about websites they may and may not visit, 73 per cent about the information they may give out online, and 69 per cent about communicating with people online.

³² This construct is based on individual items where participants were asked to rate the frequency with which their parents regulate the amount of time they spend using particular technologies on a scale from 0 = never to 3 = always. Thus the vertical axis gives an indication (from the perspective of the child) of the frequency with which parents regulate the amount of time learners spend using technologies.

The means of the 'parental internet content control' items were combined to create a single factor.

ANOVA was conducted to explore the relationship between age and gender of young people and parental internet content control (Figure 69). There is a significant main effect of age: younger age groups are significantly more likely than older age groups to report that their parents regulate their internet use more often. There is no significant effect of gender. There is no significant interaction effect between the age of young people and their gender on parental internet content control.



N=1,037 (all participants who live with parents).

Figure 69: Parental internet content control by age and gender³³

Parental support for learning

As noted in the introduction to the section on parents, young people were asked a range of questions to measure their parents' support for learning, both in general with technology, and in terms of support for learning. Using factor analysis, two factors were identified: parents' support for learning and parents' internet support.

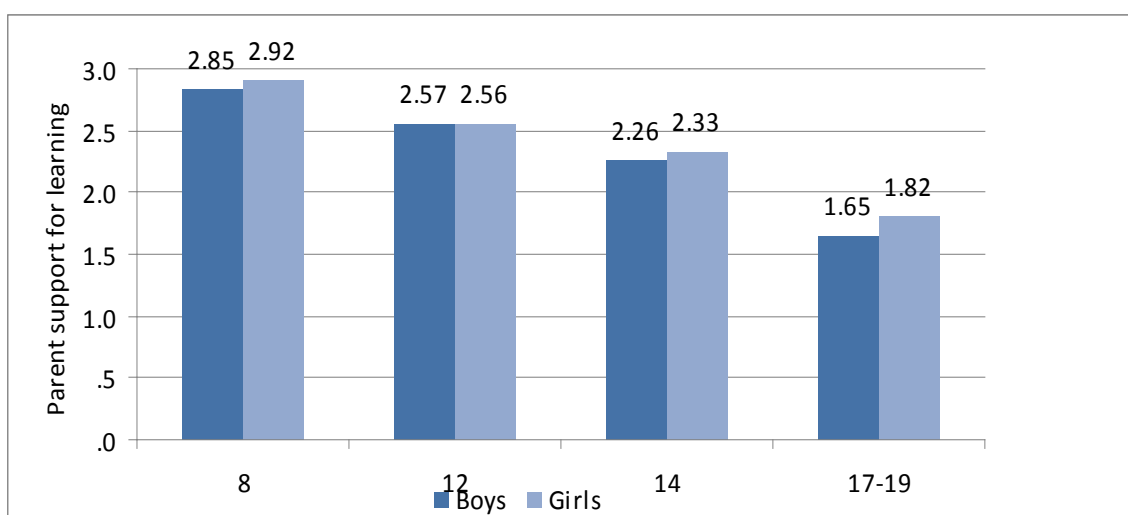
Parents' support for learning was made up of two items that asked participants how often their male or female parents, step-parents or guardians help them with school work or other interests. Overall, female carers seem to offer more support than male carers do, but both offer a relatively high level of support: 83 per cent of participants

³³ This construct was developed from individual items where participants were asked to rate the frequency with which their parents regulate their internet use on a scale from 0 = never to 3 = always. Thus the vertical access gives an indication (from the perspective of the child) of the frequency with which parents do this.

stated that their mothers, step-mothers or female guardians help them at least sometimes with school work or other interests, and 70 per cent stated that their fathers, step-fathers or male guardians help them at least sometimes with school work or other interests.

The means of the two 'parents' support for learning' items were combined to create a single factor.

ANOVA was conducted to explore the relationship between age and gender of young people and parental support for learning (Figure 70). There is a significant main effect of age: the youngest age groups rate their parents' support as significantly higher than older age groups do. Gender is not significant and there is no significant interaction effect between the age of young people and their gender on parental support for learning.



N=1,037 (all participants who live with parents).

Figure 70: Parents' support for learning by age and gender³⁴

The second factor, parents' internet support, was made up of three items designed to measure parents' support of online learning.

Overall, it seems that parents do provide some kind of support while young people are using the internet: 65 per cent of young people who still live with their parents stated that their parents sit with them at least sometimes and use the computer or laptop, 59 per cent that their parents suggest interesting websites for them to visit,

³⁴ Participants were asked to rate the frequency with which their parents do certain tasks on a scale from 0 = never to 3 = always. Thus the vertical axis gives an indication (from the perspective of the child) of the frequency with which parents support their learning.

and 67 per cent that their parents help them when they are on the computer or laptop.

The means of the three 'parents' internet support' items were combined to create a single factor.

ANOVA was conducted to explore the relationship between age and gender and parents' internet support. Figure 71 shows the results of this analysis. There is a significant main effect of age: the youngest age groups rate their parents' internet support significantly higher than older age groups do. Gender is not significant and there is no significant interaction effect between the age of young people and their gender and parental internet support.

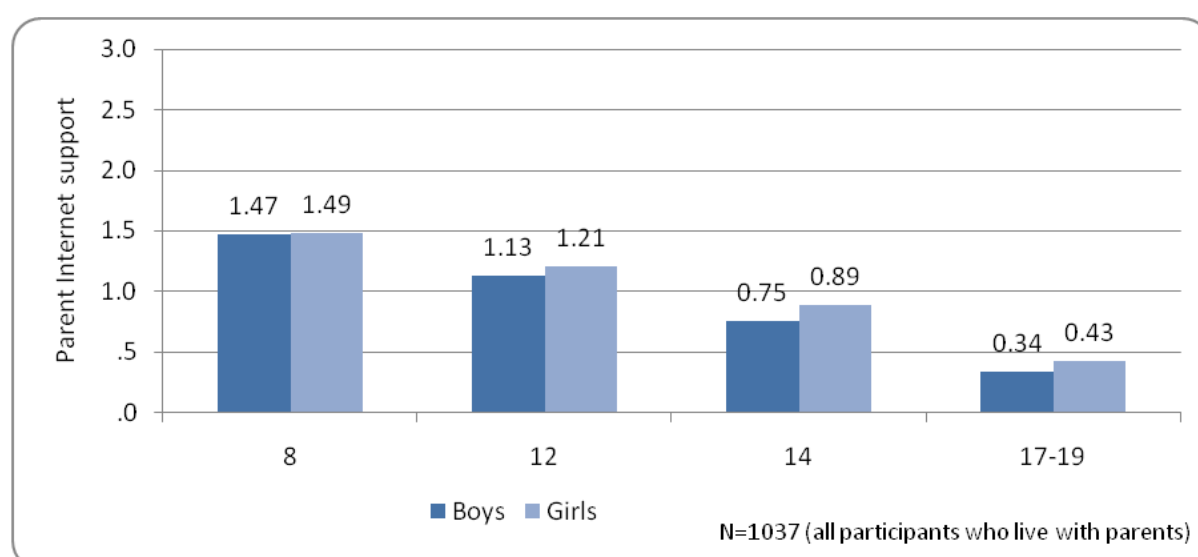


Figure 71: Parents' internet support by age and gender³⁵

Friends

Friends are another important part of a young person's network. All participants were asked to rate on a scale their agreement or disagreement with three statements about their friends and technology use on a scale from 1 = strongly disagree to 5 = strongly agree. Of the participants, 94 per cent agreed or agreed strongly with the statement 'your friends like to use technology', 74 per cent with 'you talk about technology with your friends', and 82 per cent with 'you use technology with your friends'.

³⁵ This construct was developed from individual items where participants were asked to rate the frequency with which their parents do certain things on a scale from 0 = never to 3 = always. Thus the vertical access gives an indication (from the perspective of the child) of the frequency with which parents provide learners with support to use the internet.

From the factor analysis, one factor was identified that consists of these three items. The means of the three items were combined to create a factor called friends' engagement with technology.



Figure 72: Friends' engagement with technology by age and gender³⁶

ANOVA was conducted to explore the relationship between age and gender of young people and friends' engagement with technology. There is a significant main effect of age on friends' engagement with technology (Figure 72): 8-year-olds were significantly less likely than 12-, 14- and 17- to 19-year-olds to rate their friends as engaging highly with technology. Boys tend to rate their friends' engagement with technology more highly than girls do. There is also a significant interaction effect between the age of young people and their gender. In contrast to the other three age groups, 14-year-old girls and boys rate to the same extent their friends' engagement with technology.

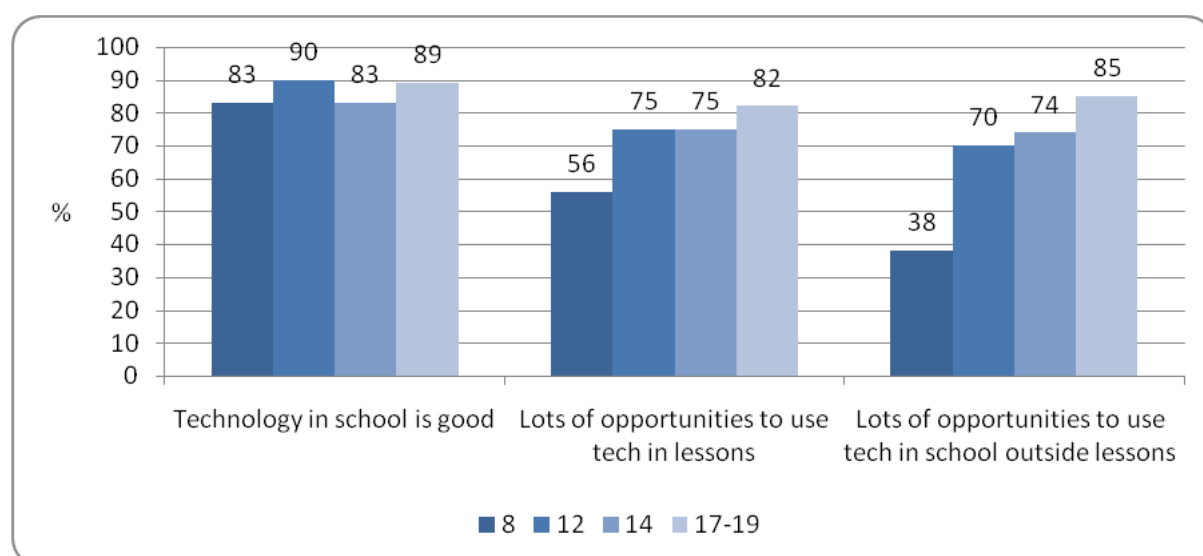
Formal education

Participants who were still in formal education were asked to rate on a scale their agreement or disagreement with five questions about the use of technology in their schools, colleges or universities on a scale from 1 = disagree strongly to 5 = agree strongly. Overall, young people are relatively positive about school provision and use of technologies: 86 per cent agreed or agreed strongly with the statement 'the technology in your school, college or university is very good', 71 per cent with 'you have lots of opportunity to use technology during lessons or lectures', 65 per cent

³⁶ This construct was developed from individual items where participants were asked to rate their agreement with the statement on a scale from 1 = strongly disagree to 5 = strongly agree. Thus the scale on the vertical access gives an indication of the level of friends' engagement with technology.

with 'you have lots of opportunity to use technology outside lessons or lectures', 71 per cent with 'you are expected to use technology for your homework', and 73 per cent with 'you use more technology at home than you do at school college or university'.

From the factor analysis, one factor measuring school use of technology was identified. The factor consisted of three of the items above: 'the technology in your school, college or university is very good', 'you have lots of opportunity to use technology during lessons or lectures' and 'you have lots of opportunity to use technology outside lessons or lectures at school'. Figure 73 shows the percentages by age that agreed or agreed strongly with each of the three statements. Eight-year-olds tend to have significantly fewer opportunities to use technologies in their lessons and outside lessons in their school.



N=918 (all participants who are in formal education).

Figure 73: School, college and university use of technology by age (% of respondents)

The means of the three 'school use of technology' items were combined to create one factor.

ANOVA was conducted to explore the relationship between age and gender of young people still in school and school use of technology (Figure 74). There is a significant main effect of age on school use of technology: 8-year-olds rate the amount of technology used in school the lowest and 17- to 19-year-olds the highest of the four age groups. Gender is not significant. There is also no significant interaction effect between the age of the young people in formal education and their gender on school use of technology.

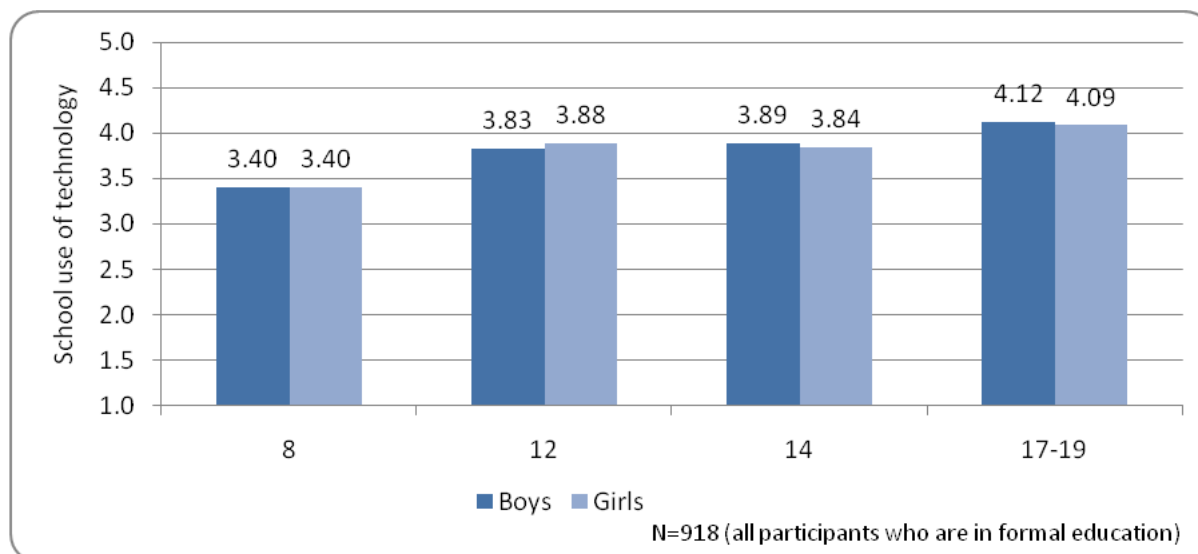
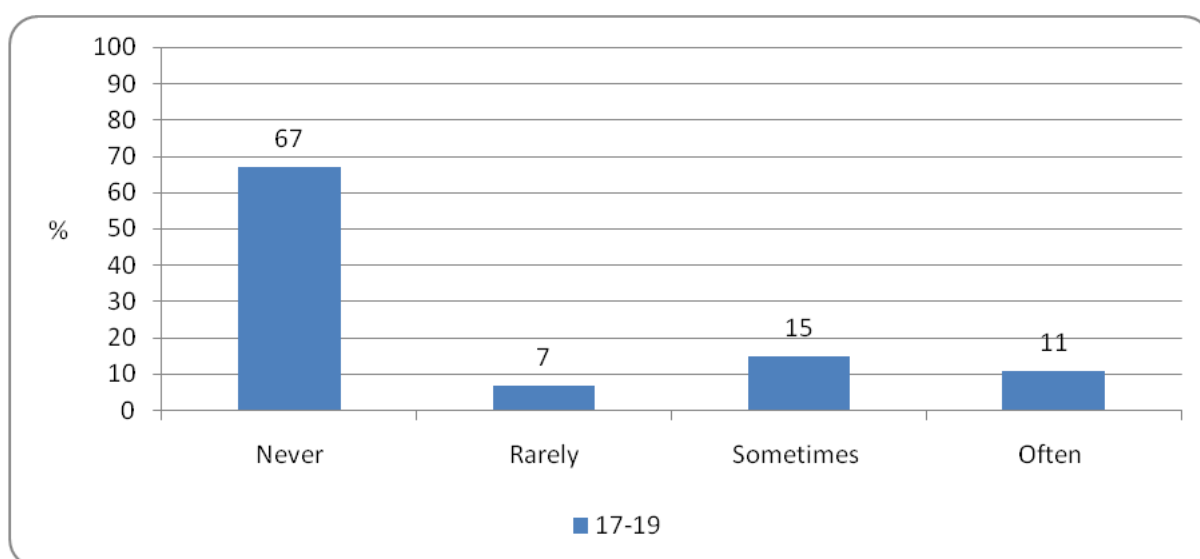


Figure 74: Formal education use of technology by age³⁷

³⁷ This construct was developed from individual items where participants were asked to rate their agreement with the statements about school use of technology on a scale from 1 = strongly disagree to 5 = strongly agree. Thus the vertical access gives an indication of the level of schools use of technology.

Work

Of the 17- to 19-year-old age group, 40 per cent were full-time students, 23 per cent were unemployed, 18 per cent were working full time, 10 per cent were full-time students working part time, 5 per cent were working part time, 2 per cent were working part time and studying part time, and 2 per cent were looking after others and/or the home. Of those who work, the majority do not use computers and the internet in their jobs (Figure 75). This is not just a reflection of part-time work while studying. Of those who work full time, 68 per cent said their job never involves the use of the computers and the internet.



N=92 (all participants aged 17–19 who are in full-time or part-time employment).

Figure 75: Frequency of use of computers and the internet for work (% of respondents who work)

Of those who worked, a minority had the opportunity to learn new computer skills: 13 per cent had lessons on how to use a computer at work, 17 per cent had learnt skills about spreadsheets and so on, 16 per cent had learnt skills to produce graphics, signs and publicity materials, and 17 per cent had learnt skills to write to customers using mail merge and other features.

Summary: family, peer, school and work networks

It is important to understand how young people operate within a particular context. The analysis in this section provides a summary of the family, friend, school and work variables that help to understand this environment.

As is clear from the analysis above, the role of parents tends to be perceived as less significant by young people as they get older. For example, individuals from younger

age groups are significantly more likely than older age groups to rate their parents as exerting control over their technology use more often; and 8-year-olds and 12-year-olds are significantly more likely to rate their parents as supportive more often compared to those aged 14 and 17–19.

As well as parents, friends provide an important support network for young people. Interestingly, young people tend to see their friends as being highly engaged with technology; in general, those who are older are more likely to rate their friends as engaging with technology. This type of pattern, where friends become more important and parents less so, is in line with studies of young people; during adolescence, young people aspire to achieve autonomy from their parents, while peers become increasingly significant. The relationship between young people and their parents changes; however, parents vary in the level of autonomy they encourage and the support and monitoring they provide.

Overall, young people are relatively positive about school provision and use of technologies, but they still tend to use technology more at home. In addition, those who are older tend to rate school or college provision of technology more highly than younger age groups do. In quite significant contrast, those 17- to 19-year-olds who are employed seem to have a very different experience with technology while at work. Only a third of young people aged 17–19 who worked used computers in their jobs, and fewer than 20 per cent had the opportunity to learn new computer skills at work.

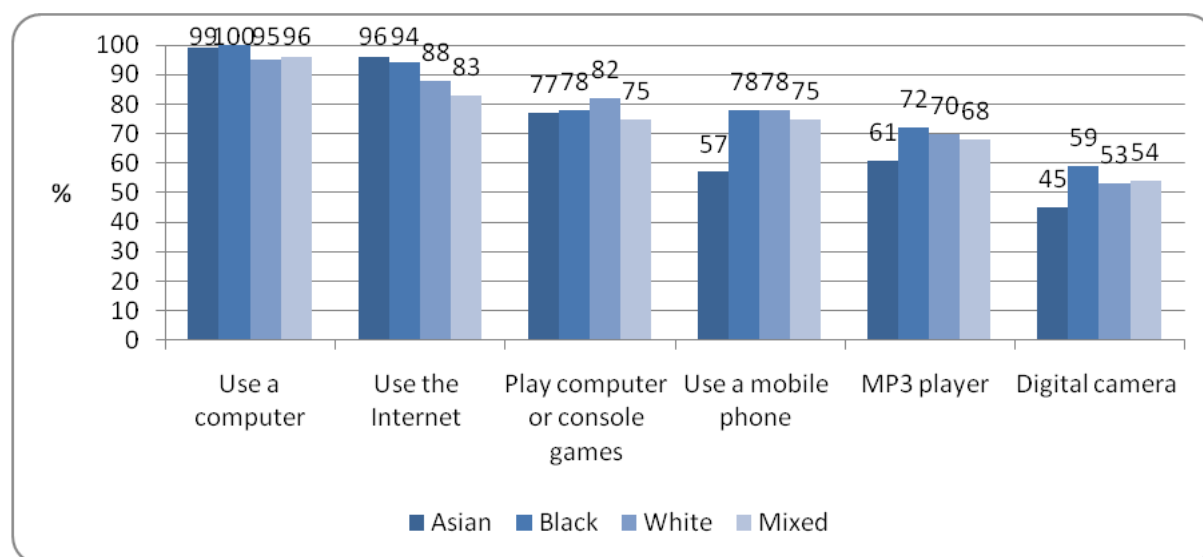
Digital divides among young people

Where once the digital divide was seen as a dichotomy between those who have and those who do not have access to a particular technology, it is now viewed as a continuum of access and use, where multiple interrelating factors such as attitudes, skills, quality of access and social support have an impact. The survey data was analysed to determine the factors that help to explain use and non-use of technologies, and the factors that help to explain the ways in which young people use technologies for the range of different purposes identified above.

Logistic regression was used to look at the independent effects of a range of factors to identify what is important in understanding use and non-use of six technologies (computers, the internet, mobile phones, games, MP3 players and digital cameras). The variables used in the logistic regression were age group, gender, attitudes towards technologies, the normalised rank score on the index of multiple deprivation (IMD), the media richness of the household, and friends' engagement in technology.

Other variables commonly associated with digital divides – ethnicity, religiousness, disability and whether English is the first language in the home – were explored in the preliminary analysis. However, either these other variables were not found to be significant when exploring use and non-use of technology, or the number of young people who fell into certain groups was too small for the analysis to be reliable.

While ethnicity was not included in the model, a breakdown of use and non-use of technologies by ethnicity is provided in Figure 76. Young Asian people appear to be far less likely than the other ethnic groups to use a mobile phone. However, these results need to be interpreted with caution because the numbers are very small.³⁸ Also, ideally there is a need for a far more finely grained analysis of different ethnic groups, which is not possible with the numbers we have here.



N=1,069 (all participants).

Figure 76: Use and non-use of technology by ethnicity (% of respondents)

³⁸ The total numbers of young people from each of the four ethnic groups were: Asian = 69, black = 32, white = 932 and mixed = 24. This provides a representative sample of the British population but means that analysis is difficult.

The full results of the logistic regression are provided in the technical appendix. For ease of interpretation, Table 3 summarises the significant variables in predicting use and non-use of each of the six technologies. The greater the number of symbols, the greater the significance of that variable; a minus sign indicates a negative relationship and a plus sign a positive one.

Table 3: Use and non-use of technology

	Computer	Internet	Mobile	Games	MP3	Digital Camera
Age		+++	+++	+++	+++	+++
Agesq	---	---	--		---	---
Gender			+	+++		+++
Attitudes towards technology	+++	+++			++	
IMD rank						++
Media richness of household		++	+	++	+++	+++
Friends	++	+++	++	+++	++	++

N =1,069 (all participants)

+ or – significant at $p \leq 0.05$, ++ or -- significant at $p \leq 0.01$, +++ or --- significant at $p \leq 0.001$

In summary, those young people who are in the middle age range of our sample hold more positive attitudes towards technology, and have friends who are more engaged in technology are more likely to be computer users. Internet users also are more likely to hold more positive attitudes towards technology, be older (particularly in the middle age group³⁹), have friends who are more engaged in technology, and have more technologies in the home.

Those who are older (particularly in the middle age group), have friends who engage with technology, are female, and have more technologies in the home are more likely to use mobile phones.

³⁹ A negative agesq relationship implies an inverted U pattern. This combined with a positive linear relationship (signified by age) means that the youngest ages are less likely to use the internet than older age groups, but within the older age groups a higher proportion of the middle age range than the oldest age group use the internet (see Figure 3).

For use and non-use of games, boys, those who are younger, who have friends who are more engaged in technology, and have more technology in their homes are more likely to play computer and console games.

For use and non-use of MP3 players, those who have more technologies in the home, are older (particularly in the middle age group), have positive attitudes towards technology, and have friends who engage with technology are more likely to use MP3 players.

In terms of use and non-use of digital cameras, those who are older (particularly age 14 and older), have more technologies in the home, have friends who engage with technology, are female and live in a less deprived area (as evidenced by the normalised IMD rank) are more likely to use digital cameras.

From this analysis, it is clear that use and non-use of technologies is not explained just by socio-economic and demographic factors; attitudes towards technologies and friends' engagement with technologies are also important. Interestingly, the variables that explain use and non-use are not exactly the same for different technologies. Only two measures – age, and friends' engagement with technology – are significant in predicting use and non-use across all technology types. Socio-economic status as measured by the IMD rank score is significant only for use and non-use of digital cameras.

Individuals and their networks: their relative importance in predicting uses of technology

Throughout this report, we have argued that in order to understand the processes at work when young people use technology, it is valuable to look at the individual and contextual factors that help to explain why a young person uses a technology in a particular way. Previous qualitative and quantitative research on this topic has identified a number of factors that explain why and how young people use new technologies in their daily lives. These factors include: demographic variables such as age and gender (Livingstone and Helsper, 2007); socio-economic factors; existence and quality of home access (Facer *et al.* 2003); self-efficacy (Broos and Roe, 2006); peer use of technology; attitudes towards technology and learning; parental engagement and regulation (Kerawalla and Crook, 2002; Livingstone and Bober, 2004); and the school environment. Thus, informed by this work, linear regressions were conducted on each type of technology use identified above to try to better understand the relative importance of individual, family, peer and educational factors on types of internet and computer use, mobile phone use and game use.

Individuals, networks and types of internet and computer use

Table 4 summarises the significant and non-significant variables in explaining the five key types of internet use: communicating, information seeking, entertaining, participating, and creativity. The full results of the linear regression are provided in the technical appendix. The greater the number of symbols, the greater the significance of that variable; a minus sign indicates a negative relationship and a plus sign a positive one.

Table 4: Kinds of use of the internet

	Entertain- ment	Communica- ting	Informa- tion seeking	Participa- ting	Creativity
Age		++	+++		---
Gender	--	+++			
IMD rank					
Home internet access	+++	+++	+++		
Personal computer access	+	+++	+	++	+++
Friends	++	+++	++	++	
Problem-solving approach	+++	++	+++	+++	++
Perceived internet ability	+++	+++	+	++	
Enjoyment of learning	++	+	++		
Parental regulation of tech				+++	
Parental support				-	+++

N=764 (all internet users aged 12, 14 and 17–19)

+ or - significant at $p \leq 0.05$, ++ or -- significant at $p \leq 0.01$, +++ or --- significant at $p \leq 0.001$

As can be seen from the table, the factors that are important in explaining types of use vary in number and significance across the five types of internet use:

- **Entertainment:** Internet users who perceive that they have high ability to use the internet, have internet access at home, employ a problem-solving approach to technology, are male, have friends who are more engaged in technology, tend not to enjoy learning, and have access to their own computers or laptops tend to use the internet for entertainment more often.

- **Creativity:** internet users who have access to their own computers or laptops, are younger, perceive their parents to be supportive, and employ a problem-solving approach to technology tend to use the internet for creative purposes more often.
- **Information seeking:** Older internet users, who have internet access at home, employ a problem-solving approach to technology, enjoy learning new things, have friends who are more engaged in technology, have access to their own computers or laptops, and perceive that they have high ability to use the internet tend to use the internet for information seeking more often.
- **Communicating:** internet users who perceive that they have high ability to use the internet, have internet access at home, have personal access to their own computers or laptops, have friends who are more engaged in technology, are older, are female, employ a problem-solving approach to technology, but do not enjoy learning tend to use the internet for communicating more often.
- **Participating:** Finally, internet users who employ a problem-solving approach to technology, have parents who often regulate their technology use, perceive their skills highly, have friends who are more engaged in technology, have access to their own computers or laptops, and perceive their parents not to be supportive tend to use the internet for participating more often.

Interestingly, one of the two factors that are significant across all types of internet use is having personal access to a computer or laptop. Thus the quality of access in the home is important. Skills also seem to be a key issue: employing a problem-solving approach to technology is significant across all five types of internet use, and perceived internet ability is significant across four types.

Friends who are engaged in technology seem more important than parents. Parents seem only to play a role in creativity (which is an activity that tends to be undertaken more often by younger children) and in participating, but in a negative sense: those young people who perceive themselves to be highly regulated and have parents who are not supportive are more likely to participate online.

Finally, a very interesting finding is that young people who enjoy learning tend to do more information seeking, but those who say they do not enjoy learning tend to engage in more entertainment and communicating activities online. This finding demonstrates the complex relationship between technology use and learning outside school.

Table 5 summarises the significant and non-significant variables explaining the three key types of use of a computer and the internet for homework: producing homework,

research homework and using a VLE. The full results of the regression analysis are provided in the technical appendix. As above: the greater the number of symbols the greater the significance of that variable; a minus sign indicates a negative relationship and a plus sign a positive one.

Table 5: Kinds of use of computers and the internet for doing homework

	Producing	Researching	Using a VLE
Age			+++
Gender			
IMD rank			
Home internet access		+++	
Personal computer access	++		
Friends		+++	+
Problem-solving approach	+++	+++	
Perceived internet ability		++	
Belief in ability to do well at school	+++	+	
School use of technology			++
Parental regulation of technology		++	
Parental support		+	

N=640 (all internet users aged 12, 14 and 17–19 in formal education)

+ or – significant at $p \leq 0.05$, ++ or -- significant at $p \leq 0.01$, +++ or --- significant at $p \leq 0.001$

Again, the factors that explain the three types of use of computers and the internet for doing homework tend to differ to some extent:

- **Producing homework:** internet users who tend to believe that they can do well at school, who employ a problem-solving approach to technology and have access to their own computers or laptops are more likely to use a computer and the internet to produce homework.
- **Researching homework:** internet users who have friends who are more engaged in technology, who have internet access at home, who employ a problem-solving approach to technology, who perceive their skills to use the internet quite highly, who have parents who tend to regulate their use of technology, who live in less deprived areas (as evidenced by the normalised IMD rank), who believe they can do well at school and perceive their parents to be supportive tend to use computers and the internet for researching homework more often.

- **Using a VLE:** The use of a VLE or LMS tends not to be about skills, parental support or quality of access at home. Internet users who are older, who tend to perceive that their schools or colleges use a lot of technology and who have friends who are more engaged in technology are more likely to use a VLE or LMS.

Looking across all three types of use of computers and the internet for homework, a number of factors seem to be particularly important. For understanding those who tend to use computers and the internet for producing and researching homework more often, the following seem to be important:

- skills (both in terms of self-rated ability to use the internet and employing a problem-solving approach to technology)
- attitudes (belief in the ability to do well at school)
- access (either in the form of learners having access to their own computers or having internet access at home).

Interestingly, learners' perceptions of the school's use of technology are significant only for understanding using a VLE; this may be because the use of VLEs or LMS in schools is still in an early phase.

Individuals, networks and types of game use

Table 6 summarises the significant and non-significant variables in explaining the use of two key types of playing games: society and environment, and action and strategy games. The full results of the regression analysis are provided in the technical appendix. As above: the greater the number of symbols, the greater the significance of that variable; a minus sign indicates a negative relationship and a plus sign a positive one.

Table 6: Kinds of use of playing games

	Society and environment	Action and strategy
Age	–	
Gender	+++	---
IMD rank		
Friends		
Problem-solving approach		+++
Perceived ability to play games	+++	+++
Parental regulation of technology	+	+
Parental support		

N=632 (all game players aged 12, 14 and 17–19)

+ or – significant at $p \leq 0.05$, ++ or -- significant at $p \leq 0.01$, +++ or --- significant at $p \leq 0.001$

As demonstrated in Table 6:

- **Society and environment games:** Game players who are female, who perceive their ability to play games highly, who have parents who tend to regulate their time using technology and are younger tend to play society and environment games more often.
- **Action and strategy games:** Game players who are male, who perceive their ability to play games highly, who employ a problem-solving approach to technology and have parents who regulate their use of technology tend to play action and strategy games more often.

Thus, types of game play tend to be quite highly gender based, perceived ability is an important factor, and parents do tend to regulate the activities of game players (regardless of what type of games they play).

Individuals, networks and types of mobile phone use

Table 7 summarises the significant and non-significant variables in explaining the three key types of use of a mobile phone: calling and texting, multimedia and accessing the internet. The full results of the regression analysis are provided in the technical appendix.⁴⁰ As above: the greater the number of symbols the greater the

⁴⁰ Note that linear regressions were conducted for traditional and multimedia phone use. Logistic regression was used for accessing the internet. (Please see technical appendix for further information.)

significance of that variable; a minus sign indicates a negative relationship and a plus sign a positive one.

Table 7: Kinds of use of mobile phones

	Calling and texting	Multimedia	Accessing internet
Age	+++	---	
Gender	++		
IMD rank		---	
Time using a mobile		+++	
Friends	+	+++	
Problem-solving approach	+	+	+
Perceived ability to use a mobile	+++	+++	
Parental regulation of tech			-
Parental support			

N=730 (all mobile phone users aged 12, 14 and 17–19)

+ or – significant at $p \leq 0.05$, ++ or -- significant at $p \leq 0.01$, +++ or --- significant at $p \leq 0.001$

As can be seen from Table 7:

- **Calling and texting:** Mobile phone users who tend to rate their ability to use a mobile phone highly, who are older, female, employ a problem-solving approach to technology and have friends who are more engaged in technology are likely to use their mobile phones more often for traditional uses (ie calling and texting).
- **Multimedia:** Mobile phone users who tend to rate their ability to use a mobile phone highly, who have used a mobile phone for longer, who have friends who are more engaged in technology, who come from more deprived areas and employ a problem-solving approach to technology tend to use their mobile phones more for multimedia purposes.
- **Accessing the internet:** While the numbers are small, and so should be interpreted with caution, mobile phone users who employ a problem-solving approach to technology and who have parents who tend not to regulate their technology use are more likely to use their mobile phones to access the internet.

Thus, in particular, skills are important (both in terms of perceived ability and employing a problem-solving approach) in explaining the amount of use of a mobile

phone for texting and calling and multimedia purposes, as is having friends who are engaged in technology.

Summary: individuals, networks and types of technology use

From the analysis above, it is clear that there are a number of important individual and contextual factors in understanding use of computers and the internet, playing games, and uses of a mobile phone.

In terms of individual factors, skills are important, both in terms of a young person's belief in his or her skills to use technologies and employing more of a problem-solving approach towards their use. For example, internet users aged 12, 14 and 17–19 who are still in formal education and who employ a problem-solving approach to technology tend to use the internet and computers more often for producing and researching homework. Similarly, game players aged 12, 14 and 17–19 who rate their ability to play games more highly are significantly more likely to play strategy and action games and society and environment games more often. Finally, mobile phone users aged 12, 14 and 17–19 who tend to rate their ability to use a mobile phone highly are more likely to use their mobile phones more often for traditional and multimedia uses.

A related issue is attitudes, both towards technology and learning. For example, internet users aged 12, 14 and 17–19 who are still in formal education and who believe they can do well at school or college tend to use the internet and computers more often for producing and researching homework.

In terms of contextual factors, a key issue is the quality of access that young people have to technology. In general, those who have a better quality of access tend to do certain activities online more often. For example, internet users aged 12, 14 and 17–19 who have personal access to a computer use the internet significantly more often for communicating, information seeking, entertainment, creativity and participating.

A second important contextual aspect is having friends who are engaged in technology. For example, mobile phone users who have friends who are engaged in technology tend to use their mobile phones more often for texting, calling and multimedia purposes.

Parental involvement is also important to some extent, but is a complex area.⁴¹ For example, internet users who perceive their parents as supportive tend to use the internet more often for creativity. Also, internet users aged 12, 14 and 17–19 who are

⁴¹ Note that more sophisticated analysis on this issue is possible only for 12-, 14- and 17- to 19-year-olds due to the simplified nature of the questionnaire for those aged 8 – but clearly parents would have most influence upon this youngest age group.

still in formal education, who perceive their parents to be supportive and whose parents regulate their technology use more frequently tend to use the internet and computers more often for researching homework. However, interestingly, those internet users who perceive themselves to be highly regulated, and who have parents who are not supportive are more likely to participate online.

Finally, contexts of formal education are important to some extent (eg in understanding use of a VLE or LMS) but not as important as other aspects of the networks identified above.

Implications for the Harnessing Technology strategy

Engaged and empowered learners

Young people tend to be relatively high users of technology, both in terms of the range of technologies they use and the kinds of technological activities they engage in. However, it is important that we understand the significant diversity that is present within this group of young people: age, gender and the home context are just some of the aspects that have been shown to play a part in explaining use and non-use of technologies and the kinds of activities young people use technology for.

This survey has identified a number of factors that need to be considered in order to support young people in their uses of technology, and these will be discussed with respect to the three relevant Harnessing Technology outcomes: learner entitlement is met with all vulnerable groups supported; technology adds value to family and informal learning; and learners use technology confidently and safely to support their learning.

Learner entitlement is met with all vulnerable groups supported

One important aspect of learner entitlement is the quality of access that young people have to technology. In the case of computers and the internet (which around 90 per cent of young people consider at least somewhat important for learning new things), 87 per cent of young people have at least one computer at home, and 82 per cent have access to the internet at home. This level of access at home is higher than that of the overall UK population, yet is by no means universal. This is important because home access has implications for how young people engage with technology. For example, internet users aged 12, 14 and 17–19 who are still in formal education and have internet access at home tend to use computers and the internet for researching homework more often.

While we must not forget about those young people who do not have access to technologies at home, it can be argued that as the computer becomes a more typical feature of households, the quality of the access that young people have to these technologies in their homes becomes increasingly important. The quality of access in the home can be measured in a number of different ways, including the number of working computers in the home, personalised computer access, and the amount of negotiation required on the part of the child to gain access to particular technologies. From the analysis here, age is an important factor in the quality of home access; for example, those from the younger age groups seem to need to negotiate access to a home computer more often.

The quality of access to technologies has implications for the ways in which and the frequency with which young people engage with technology. For example, internet

users aged 12, 14 and 17–19 who are still in formal education who have personal access to a computer or laptop tend to use computers and the internet significantly more often for producing homework.

When ensuring that learner entitlement is met with respect to access to technologies and that all groups are supported, both home access and the quality of access within the home need to be considered; this should be viewed as a constantly shifting target.

Technology adds value to family and informal learning

The roles of parents and friends are important aspects of understanding the potential of technology to support family and informal learning.

The findings from this survey demonstrate that parents are involved in their children's uses of technology in some, but not all, respects, particularly among the younger age groups. This involvement was both in terms of setting rules about how long children could engage in technological activities and what kinds of activities they could engage in, and also in supporting their technology use. However, interestingly, parental involvement did not explain very significantly the kinds of technological activities young people engage in. Many parental factors did not correlate at all with the technological activities that young people engage in, and those that did were relatively few and not always straightforward to interpret. One reason may be that as young people get older, they tend to move away from their parents for support to some extent and more towards friends. A second reason may be that a parent getting involved is not always sufficient to have a significant impact. Thus, while it is clear that parents do have an impact, there needs to be more work to fully understand the role of parents in supporting family and informal learning.

From the analysis, it is apparent that a key element that is likely to support technology adding value to learning is the extent to which young people see their friends as engaged with technology. Young people whose friends are highly engaged with technology are more likely to use a particular technology and are also more likely to engage in specific kinds of activities more often. For example, internet users aged 12, 14 and 17–19 who have friends who are engaged in technology tend to use the internet more often for communicating, information seeking, entertainment and participating. Secondly, mobile phone users who have friends who are engaged in technology tend to use their mobile phones more often for texting, calling and multimedia purposes. Thus, when trying to understand how technology adds value to informal learning, the role of young people's friends need to be considered.

Learners use technology confidently and safely to support their learning

In general, young people tend to hold positive attitudes about technology, view certain technologies as valuable for learning, are often positive about learning new things, and tend to believe in their ability to do well at school, college or university. While these attitudes are not about confidence *per se*, they are important because they do have an important part to play in understanding whether a young person uses a particular technology and they influence the kinds of technological activities young people undertake. For example, internet users aged 12, 14 and 17–19 who are still in formal education and believe they can do well at school or college tend to use the internet and computers more often for producing and researching homework.

While survey research cannot test the actual technological skills of young people, it is possible to determine their level of confidence in using technologies. Young people's confidence in their skills is important because those who are more confident tend to engage in certain technological activities more often. For example, game players aged 12, 14 and 17–19 who rate their ability to play games more highly tend to play strategy and action games and society and environment games more often. Similarly, mobile phone users aged 12, 14 and 17–19 who rate their ability to use a mobile phone highly tend to use their mobile phones more often for traditional and multimedia uses.

In addition, the qualitative phases of the research indicated a particularly valuable skill to be to use a problem-solving approach to technology; this is supported by the survey evidence presented here. Indeed, employing a problem-solving approach to technology is a significant factor in understanding a range of different uses of technology. For example, internet users aged 12, 14 and 17–19 who employ a problem-solving approach to technology tend to use the internet significantly more often for communicating, information seeking, entertainment, creativity and participating.

In terms of young people using technology safely, the findings from this report provide a relatively positive picture. While young people are aware of the risks of using technology, in general young people are confident about keeping themselves safe online, although eight-year-olds tend to be more concerned than older age groups are. While young people often work out by themselves how to stay safe on the internet, teachers and parents are also important sources of support. Support is important because confidence does not necessarily equate to competence.

Improved personalised learning experiences

While the relationship between use of technology and learning is complex, it is likely that learning may be possible from a whole range of technological activities. In this section, we discuss the diversity in the kinds of technology use that young people

engage in and suggest ways in which this technology use could support personalised learning experiences.

In terms of using computers and the internet, five key types of uses were identified: communicating, information seeking, entertainment, creativity and participating. In general, communicating tends to be the most popular activity; creativity and participation activities the least popular. Arguably, creative and participation activities may be two important activities to enhance learning, thus aspects of internet use may need to be encouraged.

Young people who are still at school use computers and the internet for producing homework, researching homework and using a VLE or LMS. Researching homework was the most frequent activity, and using a VLE or LMS the least frequent. Through these activities, young people may be using technology to support deep and higher learning.

Interestingly, young people extend their networks by getting to know people online whom they have not met in person. Over a quarter of internet users aged 8, 12, 14 and 17–19 have got to know someone online (most often on a social networking site) whom they had not met in person – with those in the 17- to 19-year-old group the most likely to have got to know someone online. With the proviso that young people know how to keep themselves safe online, such meetings could potentially be beneficial in terms of supporting learning opportunities.

In the survey, two types of game playing were identified: strategy and action games, and society and environment games, both of which may have learning potential, for example in terms of developing young people's ability to plan, develop strategy and problem solve. In terms of personalised learning opportunities with mobile phones, currently texting and calling are the most frequent activities, and accessing the internet is the least frequent activity that young people use their mobile phones for. Learning opportunities could potentially arise from certain types of multimedia use and from accessing the internet (if this activity becomes more prevalent).

However, when thinking about supporting young people to learn with technology, in order to offer more personalised learning experiences it is very important to consider the differences in use of technologies by young people; this survey has shown that there tend to be significant differences, for example in terms of age and gender. Such diversity needs to be understood and supported in order to facilitate learning via the use of different technologies.

Enabling infrastructure and processes

High quality, tailored resources available to all learners

The focus of this survey was young people's uses of technology outside school, but, because school is an important part of young people's lives, young people's uses of technology at school was reflected to a small extent within the survey.

Overall, young people are relatively positive about school provision and use of technologies. In general, those who are older tend to rate school or college provision of technology more highly than younger age groups do.

Interestingly, the amount of school provision of technology is not a significant factor in using a computer and the internet for activities such as producing and research homework. However, it was important for understanding who uses a VLE or LMS for homework.

School is an important source of access to certain technologies for young people. Indeed, 94 per cent of 8-year-old, 97 per cent of 12-year-old, 97 per cent of 14-year-old and 56 per cent of 17- to 19-year-old internet users access the internet from school, college or university. However, although more analysis is required, it is unlikely that school provides sufficient access to technologies for those who do not have home access. For example, 73 per cent agree or agree strongly with the statement 'you use more technology at home than you do at school, college or university', and, as noted above, home access is positively related to the frequency with which young people carry out certain activities on computers, game consoles and mobile phones.

Conclusions and recommendations

1. Young people are relatively high users of technology and use technologies for a wide range of activities. However, it is important to recognise the diversity among young people in their uses of technology. We should not see all young people – those aged 8–19 – as the same. There are significant differences among these groups, which can be understood to some extent by age and gender.
2. Different factors help to explain whether a young person engages in different types of technological activity. Thus, different strategies are likely to be required to support specific kinds of technology use. It would therefore be valuable to explore what kinds of technology uses (if any) are viewed as the most valuable for learning.
3. Home access to computers and the internet remains an important issue. Young people have better access than the rest of the population to these technologies, yet access is still not universal. Among those who have computer and internet access at home, there is significant diversity in the quality of this access. Home access and quality of home access to computers and the internet have important implications for technology use. Ensuring that all young people are supported in terms of access to technologies is a constantly shifting target.
4. Generally, young people are confident users of technology. This confidence is apparent both in their rating of their skills to use particular technologies and the extent to which they employ a problem-solving approach to technology. However, confidence is not the same as competence, and young people need to be supported in appropriate ways by parents and teachers.
5. Attitudes towards technology and learning are important. In general, young people tend to hold positive attitudes about technology, view certain technologies as valuable for learning, are often positive about learning new things and tend to believe in their ability to do well at school. More positive attitudes tend to play a part in understanding whether a young person uses a particular technology and the frequency with which young people undertake particular technological activities.
6. The role of parents and guardians is important. Initial findings show that parents' attitudes about the value of technology may be important in facilitating home access to technologies, and that parents try both to support and regulate their children's technology use in the home. However, the success of these strategies is variable, and the strategies appear often not to have that great an impact. More research is required to explore the multi-

faceted interactions between parents, young people and technology in the home.

7. The role of friends is important: particularly as children move towards adolescence, those who have friends who engage with technology tend to carry out activities with a range of technologies more frequently. Thus, when thinking about young people, it is important to situate individual factors along with the networks within which they operate.
8. To a certain extent, school is important for supporting young people in their use of technologies. In general, school provides young people with a place of access and offers support in developing skills (such as keeping safe online). However, young people who are able to use technology more often at home do tend to do so.

Technical appendix

Exploratory and confirmatory factor analysis

Exploratory factor analysis (EFA) was used to explore underlying or latent phenomena (constructs) that are not directly observable, as is the case with most variables in the social sciences, for example achievement, socio-economic status, attitudes and intelligence. Using an iterative process, based on the correlation matrix (see Tabachnick and Fidell, 2000), the analysis sets out to derive underlying constructs that explain the variance in the observed items. The initial factor structure is rotated using the varimax orthogonal rotation technique (the selected rotation method; other methods are also available). Factor loadings, communalities, factor eigenvalues and explained variances are reported.

Using the method in an exploratory fashion, as in the present study, the following details were observed in order to arrive at plausible factor solutions:

- A certain item should load strongly only in one factor (above 0.35 or 0.45) and load weakly in the other factors. In other words, one item should load on one factor only, not more.
- The items in a certain factor should have a strong loading for all items that load on that factor, and display low loadings for the other items (that load on factors).
- The number of factors may be discerned by:
 - o retaining all factors with eigenvalues above 1.00
 - o the factors that together explain three-quarters of the overall variance in the items
 - o observing sudden changes in direction in a scree plot
 - o theoretical considerations.

If a factor structure was regarded as inappropriate (eg one item loading on two or more factors), it was removed.

For some constructs, continuous items were used for the 12-, 14- and 17- to 19-year-olds, while nominal scales (0 = no; 1 = yes) were used for the 8-year-olds. In order to inspect the factor structure of these constructs for eight-year olds, confirmatory factor analysis (CFA) was conducted using the factor structures of the older groups as the a priori structure. In order to accommodate the nominal scale items, the analyses were carried out in Mplus software (Muthén and Muthén, 2006). The models, in most cases, fitted the data fairly well, suggesting that the dichotomous items could well be used in the youngest age group.

Internal consistency

Internal consistency of constructs is commonly calculated by Chronbach's alpha coefficient (Chronbach, 1951), which is a standardised metric (0.00–1.00 for acceptable values) of whether participants respond to items in a systematic way across the items that measure the same latent construct. Usually, values above 0.60 are regarded as appropriate, although higher boundaries have been proposed by some authors (eg Bernardi, 1994). SPSS provides several useful descriptive values for this reliability coefficient – among others, indications of whether the reliability might increase if a certain item were excluded from a construct; this indication is useful for post-hoc derivation of constructs.

Analysis of variance (ANOVA)

In general, the purpose of analysis of variance (ANOVA) is to test for significant differences between means. Three or four (age group) x 2 (gender) ANOVAs were carried out on each construct, created using planned linear contrasts, to detect linear differences between the three (or four) age groups.

Linear and logistic regression

Both linear and logistic regression models were carried out in order to compare the relative importance of individual and contextual factors in understanding both who does and does not use particular technologies and the kinds of activities people use technology for.

Logistic regression using the forced entry method was used to examine the factors that are significant in predicting technology use. Logistic regression is appropriate in cases where the intention is to predict a dichotomous outcome – that is, whether a person uses a technology or not.

Linear regression, utilising a similar approach to that for logistic regression, was also used to understand the number of people engaged in specific types of technology use. Demographic, socio-economic, attitudinal, skill and contextual explanatory variables were selected on the basis of previous work in this area.

The results of all data analysis are summarised in the tables below.

Table 8: Logistic regression of use and non-use of technologies

	Society and environment				Action and strategy			
	B	SE	β	p	B	SE	β	p
(Constant)	.463	.344		.179	-.024	.281		.931
Age	-.034	.016	-.094	*	.018	.013	.049	.171
Gender	.456	.068	.277	***	-.814	.055	-.491	***
IMD rank	-.035	.032	-.042	.281	-.029	.026	-.035	.275
Friends	.000	.054	.000	.997	.016	.044	.013	.713
Problem-solving approach	.058	.048	.051	.226	.129	.039	.113	***
Perceived ability to play games	.197	.047	.180	***	.252	.038	.228	***
Parental regulation of tech	.098	.041	.107	*	.071	.033	.077	*
Parental support	-.007	.045	-.006	.876	.033	.037	.030	.369
R squared	.095				.405			

N=632 (all game players aged 12, 14 and 17–19)

* Significant at $p \leq 0.05$, ** Significant at $p \leq 0.01$, *** Significant at $p \leq 0.001$

Table 9: Logistic regression of use and non use of technologies

	Playing games				MP3 player				Digital Camera			
	B	SE	β	p.	B	SE	β	p.	B	SE	β	p.
Age	-.216	.029	.806	***	.236	.023	1.266	***	.208	.022	1.231	***
Agesq	-.011	.008	.989	.131	-.028	.006	.972	***	-.019	.006	.981	***
Gender	-1.715	.214	.180	***	.189	.161	1.208	.239	.467	.147	1.595	***
Attitudes towards technology	.215	.177	1.239	.225	.428	.159	1.533	**	.019	.147	1.019	.897
IMD rank	.035	.092	1.036	.703	-.052	.078	.950	.509	.188	.073	1.207	**
Media richness of household	.299	.102	1.349	**	.466	.089	1.594	***	.680	.089	1.974	***
Friends	.493	.147	1.637	***	.328	.128	1.388	**	.423	.123	1.526	***
(Constant)	1.670	.707	5.313	*	-6.904	.725	.001	***	-7.246	.700	.001	***
Nagelkerke R2=	0.295				0.334				0.303			
Correctly predicted	84%				78%				72%			

N=1,069 (all participants).

*Significant at $p \leq 0.05$, **significant at $p \leq 0.01$, ***significant at $p \leq 0.001$.

Table 10: Linear regression of types of use of the internet

	Entertainment				Creativity				Info seeking				Communicating				Participating			
	B	SE	β	p	B	SE	β	p	B	SE	β	p	B	SE	β	p	B	SE	β	p
(Constant)	-1.082	.407		**	.201	.353		.569	-2.733	.333		***	-2.408	.444		***	-2.26	.398		***
Age	.022	.019	.044	.248	-.070	.016	-.175	***	.098	.016	.238	***	.061	.021	.107	***	.034	.019	.073	.069
Gender	-.241	.078	- .103	**	.114	.068	.060	.094	-.029	.064	-.015	.647	.277	.085	.103	***	.103	.076	.047	.180
IMD rank	.007	.039	.006	.850	-.063	.034	-.066	.068	.006	.032	.006	.845	-.031	.043	-.023	.474	-.041	.039	-.04	.288
Home internet access	.725	.139	.184	***	.141	.120	.044	.243	.485	.114	.148	***	.918	.152	.201	***	.129	.136	.035	.343
Personal computer access	.196	.083	.084	*	.338	.072	.179	***	.162	.068	.084	**	.353	.090	.131	***	.215	.081	.098	***
Friends	.200	.069	.112	**	.076	.060	.053	.204	.156	.056	.105	**	.344	.075	.167	***	.178	.067	.107	***
Problem-solving approach	.218	.061	.134	***	.160	.053	.121	**	.159	.050	.117	***	.171	.066	.090	**	.269	.060	.175	***
Perceived internet ability	.387	.069	.218	***	.044	.060	.030	.468	.119	.057	.080	*	.510	.076	.248	***	.231	.068	.138	***

	Entertainment				Creativity				Info seeking				Communicating				Participating			
	B	SE	β	p	B	SE	β	p	B	SE	β	p	B	SE	β	p	B	SE	β	p
Enjoy learning	-.195	.075	-.102	**	.034	.065	.022	.596	.185	.061	.116	**	-.179	.082	-.081	*	.015	.073	.008	.842
Parental regulation of technology	-.091	.049	-.071	.065	.025	.043	.024	.565	.000	.040	.000	.980	-.075	.054	-.050	.164	.189	.048	.156	***
Parental support	.010	.055	.007	.849	.160	.048	.126	***	.020	.045	.015	.661	-.014	.060	-.008	.809	-.135	.054	-.09	*
R squared	.209				.103				.238				.299					.146		

N=764 (all internet users aged 12, 14 and 17–19).

*Significant at $p \leq 0.05$, **significant at $p \leq 0.01$, ***significant at $p \leq 0.001$.

Table 11: Linear regression of types of use of the internet for homework

	Producing				Researching				Using a VLE			
	B	SE	β	p	B	SE	β	p	B	SE	β	p
(Constant)	-1.636	.419		***	-1.741	.391		***	-3.431	.607		***
Age	.024	.021	.050	.245	.034	.019	.072	.080	.142	.030	.206	***
Gender	.025	.078	.012	.749	.051	.073	.026	.485	.070	.113	.024	.532
IMD rank	-.047	.039	-.047	.219	.064	.036	.065	.075	-.022	.056	-.015	.696
Home internet access	.191	.138	.055	.166	.438	.129	.129	***	.361	.201	.073	.072
Personal computer access	.252	.083	.124	**	.091	.077	.046	.237	.125	.120	.043	.300
Friends	.028	.069	.018	.684	.218	.064	.143	***	.231	.099	.103	*
Problem-solving approach	.214	.059	.149	***	.181	.055	.130	***	.112	.086	.054	.193
Perceived internet ability	.042	.068	.027	.538	.163	.063	.107	**	-.028	.098	-.013	.774
Belief in ability to do well at school	.307	.075	.177	***	.148	.070	.088	*	.028	.108	.011	.799
School use of technology	.078	.058	.054	.185	.010	.054	.007	.851	.234	.084	.116	**
Parental regulation of technology	.044	.049	.039	.363	.117	.045	.105	**	.126	.070	.077	.074
Parental support	.042	.056	.031	.449	.109	.051	.082	.*	.117	.080	.061	.141
R squared	.130				.197				.108			

N=764 (all internet users aged 12, 14 and 17–19).

*Significant at $p \leq 0.05$, **significant at $p \leq 0.01$, ***significant at $p \leq 0.001$.

Table 12: Linear regression of types of mobile phone use

	Traditional				Multimedia				Accessing the internet ⁴²			
	B	SE	β	p	B	SE	β	p	B	SE	β	p
(Constant)	.328	.367		.372	.238	.423		.574	-4.190	1.11	.015	***
Age	.079	.020	.192	***	-.086	.023	-.187	***	-.024	.055	.977	.668
Gender	.184	.068	.094	**	-.051	.079	-.023	.518	-.157	.198	.855	.429
IMD rank	-.053	.034	-.054	.124	-.128	.040	-.117	***	-.066	.100	.937	.513
Length of time using a mobile	-.006	.019	-.014	.768	.093	.022	.199	***	.082	.053	1.086	.120
Friends	.131	.055	.091	*	.239	.064	.147	***	.187	.168	1.205	.266
Problem-solving approach	.123	.052	.090	*	.138	.060	.090	*	.362	.159	1.436	*
Perceived ability to use a mobile	.442	.054	.299	***	.344	.062	.208	***	.289	.171	1.335	.091
Parental regulation of technology	-.009	.043	-.009	.831	-.064	.050	-.053	.199	-.318	.131	.728	*
Parental support	-.066	.047	-.051	.161	.038	.055	.026	.639	.068	.137	1.070	.620
R squared	.194				.146				.077			

N=730 (all mobile phone users aged 12, 14 and 17–19).

*Significant at $p \leq 0.05$, **significant at $p \leq 0.01$, ***significant at $p \leq 0.001$.

⁴² Please note logistic regression was used for accessing the internet, ie did a person use his or her phone to access the internet?

Table 13: Linear regression of types of game use

	Society and environment				Action and strategy			
	B	SE	β	p.	B	SE	β	p.
(Constant)	.463	.344		.179	-.024	.281		.931
Age	-.034	.016	-.094	*	.018	.013	.049	.171
Gender	.456	.068	.277	***	-.814	.055	-.491	***
IMD rank	-.035	.032	-.042	.281	-.029	.026	-.035	.275
Friends	.000	.054	.000	.997	.016	.044	.013	.713
Problem-solving approach	.058	.048	.051	.226	.129	.039	.113	***
Perceived ability to play games	.197	.047	.180	***	.252	.038	.228	***
Parental regulation of technology	.098	.041	.107	*	.071	.033	.077	*
Parental support	-.007	.045	-.006	.876	.033	.037	.030	.369
R squared	.095				.405			

N=632 (all game players aged 12, 14 and 17–19).

*Significant at $p \leq 0.05$, **significant at $p \leq 0.01$, ***significant at $p \leq 0.001$.

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