Use of ICT by young people in England

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1 Introduction

ICT is becoming essential to work and daily life; it is changing the nature of work and the skills required in the workplace. It has been at the centre of government policies in the UK and across Europe since the early 1980s. For example, in 2005, the Department for Education and Skills published the e-Strategy 'Harnessing Technology: Transforming learning and children's services'. This provided a strategy across the whole sector covering adults and children. In Wales, an e-learning Strategy was published in 2004 covering all learning in Wales. The European Union produced action plans in 2002 and 2005 aimed at achieving the Lisbon 2010 objectives of "making the European Union the most competitive and dynamic knowledge-based economy in the world" and acknowledging the importance "of providing citizens with the access and skills needed to live and work in the new information society".

However, there are 17.3 million people in the UK who do not use the Internet. This includes almost 3 million adults who are lapsed users (COI and MORI, 2005). Furthermore, Gartner (2004) reported that although information technology was critical for the success of the UK economy and impacted on more than 20 million employees, 40% of users have not received any IT training while employers require ever increasing levels of IT skills. It has been suggested that in this time of rapid penetration of new technologies, the inability to use or access Information and Communication Technology (ICT) will lead to a form of social exclusion, defined as information poverty (Katz and Aspden, 1997; Loader 1998).

This research attempts to investigate the socioeconomic and demographic characteristics of young people who do not use ICT and whether the lack of ICT use is associated with other outcomes of deprivation.

In terms of the background characteristics of young people's use of ICT, the report focuses on the following questions:

1. Are there differences in the socioeconomic and other background characteristics of young people who use computers at home with respect to those who do not? Do we find a gender gap, socioeconomic gap, educational gap, or income gap in the use of computers at home?
2. Are there differences in the socioeconomic and other background characteristics of young people who use computers at school?
3. Are there differences in the socioeconomic and other background characteristics of young people who own and use mobile phones?

An additional question deals with the association between young people's ICT use and other risk outcomes, such as achieving low grades in key stage exams, anti-social behaviour, being involved in crime, or being in care. It is important to notice that in addressing this question, we do not imply causality in the sense that ICT use causes low qualifications or anti-social behaviour, but just an association between these variables. Still, finding that lack of ICT use is associated with other outcomes of deprivation is important in that it highlights that the poorest, or most deprived young

people, are lagging behind not only socially and economically, but also technologically. The main question to address here is:

4. Is the lack of ICT use associated with other outcome of deprivation for young people?

Finally, we explore attitudes of young people towards the importance of the use of computers for the current school work. The importance of this issue relies in the fact that young people may not only face economic constraints to ICT, but also attitudinal constraints as some young people may think that ICT is not important or relevant for their lives (Selwyn, 2003). The question being address here is:

5. What are the individual and family factors associated with attitudes towards computer use by young people?

This report is organised as follows: Section 2 describes the background for the study, highlighting changes in policy and recent research findings. Section 3 describes the data and variables used in the analysis whereas Section 4 sets out the methodology for estimation. Section 5 reports the results and Section 6 concludes with the implication of this research for policy.

2 Background

The importance of ICT skills for citizen participation within political, economic and social communities has been established clearly through European and subsequent national policies. However, there has been little mention of the underpinning skills required to fully meet the needs of the Information Society. The recently defined Adult ICT Skill for Life (QCA, 2007) curriculum, although implicitly acknowledging the need to interpret and make use of texts in a purposeful manner, does not detail the requisite skills in support of this activity, assuming instead their implicit existence.

Government policy is concerned primarily within technological non-engagement, and user-skills, with particular emphasis upon the Internet as a mobilising force for information and society. However, the retrieval and interpretive skills required to make meaningful use of the Internet is often missing. Additionally, most of the academic studies relating to information systems, and research around ICT users, are based upon those who have already identified a need, and are either educationally successful, or are at least already considered learners in some capacity. Lamb and Kling (2003) describe the average individual participating in information systems research as “an atomic individual with well-articulated preferences and the ability to exercise discretion in ICT choice and use, within certain cognitive limits (p. 199).” This may explain the comparatively low levels of recognition of the importance of underpinning skills within the broader technological skill-set.

Warschauer (2003), agrees that it is critical for social inclusion to improve the ability to access, adapt, and create new knowledge using new information and communication technology. However, one common problem is too much emphasis on basic computer literacy in isolation from broader skills of composition, research or analysis may not be sufficient. Of the literacies mentioned, information literacy is the

best understood, and Warschauer is clear that information literacy in support of ICT skills is of paramount importance and that ideally the citizen should be equipped both with computer-specific knowledge and wider critical literacy skills.

Hence, since 2000 the EU identified ICT as a basic skills, and in 2004 in England, the government announced that ICT would also become the fourth skill for life alongside literacy, language and numeracy. Clarke, (2004, 2006, & 2007) describes fourth reasons that supports the need to define ICT as a basic skill: (i) the majority of new (90%) and existing jobs (72%) now require the use of ICT; (ii) technology was a part of everyone's lives; (iii) computers were now an important aspect of education and training; and (iv) many government and commercial services were now available online.

Still, there are potentially 17.3 million people (COI and MORI, 2005) who may need help in acquiring ICT skills. And the digital divide is more than a simple lack of skills. It also involves access to technology and the cost of paying for services. One measure of the divide is household access to the Internet. The Office for National Statistics (2006) reported that overall household access had improved from 46% in 2002 to 57% in 2006. However, this figure tends to hide the variation across the UK with only 48% of households in Scotland, 50% in Northern Ireland and 52% in Wales compared to 67% in South East England with access. Equally, it does not indicate who uses the Internet in households with access.

Another issues regarding lack of ICT skills is its relationship with social exclusion. It is widely held that whilst the absence of access to ICT does not cause social exclusion, a lack of access could reinforce disadvantage, potentially worsening the relative situation of those already excluded and "exacerbating existing educational inequalities in the age of 'e-learning'" and the Information Society. According to Mawson (2001), without intervention, rapid technological change may lead to the increased exclusion of social groups, because they lack the qualifications to keep up with the changes. Despite this, access doesn't necessarily translate to use. A study conducted by Selwyn (2002) found that although 92 per cent of the survey sample reported having some form of access to a computer, only 52 per cent had made use of one during the past twelve months.

3 Data

We use the National Longitudinal Survey of Young People in England (LSYPE) for this analysis. The LSYPE is a mayor new longitudinal study of young people in Britain. The purpose of LSYPE is to chart the progress of a cohort of young people who had been exposed to new government policies directed at young people such as the new ConneXions Service and Educational Maintenance Allowances (EMAs). The study follows a large cohort of young people (up to 20,000), initially contacted at age 13/14 and to be followed-up every year into their mid-twenties. The sample has been boosted to ensure adequate representation of ethnic minorities (up to 5,000) young people living in disadvantaged areas. The first sweep of information was collected in 2004, which is used for our study.

3.1 ICT use in LSYPE

There are several questions dealing use of computers at home and school as well as mobile phone use in the LSYPE. The first set of questions investigates whether the young person uses computer or laptop at home, school, or anywhere else. There are 84% of young people who use computers at home, 97% who use computers at school, 33% who use computers somewhere else, and finally 0.6% do not use computer at all. We see this last group as our main target in terms of investigating the characteristics of these young people who do not use ICT at all.

The next set of questions deals exclusively with the use of computers at home (with 84% of the sample). The vast majority of the young people who have access to a computer at home uses it for school related work (91.5% of young people), however the frequency of use is more dispersed as only 25% of those with computers at home use it for school work on average three or more days a week, 53% use it on average for one or two days a week and a further 22% use it for less than one day a week on average.

Young people are also asked about the type of software applications used with home computer to help with school work. Among these applications we found word processing, spreadsheets, graphics, email, or use of the web for information. Similar information is asked for the use of computer at home for uses other than school work. In this case, young people reported whether they use home computer for email, communicating in chatrooms, playing computer games, listening to music, or cd-roms.

For young people who reported using computers at school, there is information about the frequency of use. Young people were asked how many days a week they used computers in ICT or computing lessons and also how many days a week they used the computer in non-computing lessons. From the total of 14,992 young people who have access to computer at school, 12% (1,862 young people) reported using the computer for less than 1 day a week or not using the computer at all for computing or non-computing lessons, and a further 7% reported using the computer for less than 1 day a week in computing lessons but more than 1 day a week in non-computing lessons. The majority of young people use computers on average for 1 to 2 days a week in computing lessons (regardless of non-computing lessons) while only 8% use computers for more than 2 days a week for computing lessons (regardless of non-computing lessons).

In terms of computers use, young people also reported their perceptions of the value of computer in assisting do well at school. About 32% of young people thought that computers are very important to do well at school and 54% felt that it was fairly important. Only 13.7% felt that it was either not very important (12.5%) or not important at all (1.2%).

Finally, mobile phone ownership can be an important resource for young people's access and use of technology. From our sample of young people, 80.6% own a mobile. Although the use of mobile phone for accessing web site was only reported by 13% of young people with mobile phones, emailing people was only reported by 10% of young people and sending pictures with the phone to 38% of young people.

3.2 Background characteristics of young people in the LSYPE

There are several variables to investigate the background characteristics of young people according to use of computers at home, at school, or mobile phone ownership. In order to structure the presentation of these factors, we grouped them according to individual characteristics of the individual, parental background, household level information, and regional factors. Table 1 shows the descriptive statistics for these indicators.

Among the main individual level variables we include information on the young people's gender, with a half split between male and female from the total sample of 15,431 young people. Ethnicity include 67% white, 5.2% mixed race, 18% Asian, 8% Black and 1% other ethnic background. Nearly 7% reported that English is not first language at home and 13% having a long standing illness or disability. Furthermore, 19% of young people in the sample were identified as special education needs (SEN), 2% have been in care and 20% were eligible for free school meals (FSM) in 2004.

We also included information about the parental background of young people in the sample. Among the main variables we included the main parent's (or carer) health status (14% reported that their health was not very good), whether the main parent and whether the second parent suffered from a ling standing illness or disability (15% of main parents and 9% of second parents), and whether the parents received income or unemployment benefits from the government (22%). Parental education is measured by the proportion of main parents and second parents not having any recognised qualification (25% of main parent and 20% of second parents), parental class is measured by the proportion of parents in semi-skilled or unskilled occupations (19.3%), and unemployment by whether parents are considered to be in long term unemployment (8.4%).

One of the main advantages of the LSYPE over other sources of data is that it collects information on parents' attitudes and behaviours towards education, which can be as important determinants of ICT use as socioeconomic background factors. Among these variables we included whether the main parent feels that he/she has enough knowledge about modern qualifications to give advice to the young person (28% of main parents feel that they do not have this knowledge). We also included the proportion of parents that have not been to parents evenings as an indicator of lack of parental interest (10% of parents) and whether parents expect that the young person will stay on in education, as measure of parental expectations towards schooling (84% expect their children to continue in full-time education).

Table 1: Descriptive statistics for young people and parents in LSYPE sample

Variable	Description	Units	Mean
	Demographic and young person's characteristics		
Gender	Male	%	50.8
Ethnicity	White	%	67.1
	Mixed	%	5.2

	Asian	%	18.3
	Black	%	8.3
	Other	%	1.1
Language	English is not first or main	%	6.9
Illness	Long standing illness	%	13.3
SEN	Young person identified as SEN	%	19.0
Care	Young person has ever been in care	%	2.2
FSM eligibility	FSM eligibility in 2004 according to PLASC	%	20.6
	Parents' characteristics		
Health status	Main parent health status (very good)	%	49.1
	Main parent health status (not good)	%	14.1
Disability	Main parent has a disability	%	15.1
	Second parent has a disability	%	8.9
Benefits	Parents receive income or unemployment benefits	%	21.7
Education	Main parent no qualification	%	24.9
	Second parent no qualification	%	20.0
SEC	Semi-routine and routine occupations	%	19.3
Unemployed	Long-term unemployed	%	8.4
Parental knowledge	Parent does not know about modern qualifications to give advice	%	28.1
Parental interest	Parent has not been to parents' evenings	%	10.5
Parental expectations	Parents expect YP to stay in education	%	84.1
	Household characteristics		
Separated	No second parent in household	%	30.7
Financial situation	OK	%	47.4
	Just getting by	%	44.8
	Difficult	%	7.8
HHsize	Household size	#	4.5
Housing	Council	%	16.0
	Rented from housing association	%	8.9
	Owner occupied	%	76.1
	Regional characteristics		
Urban-rural indicator	Urban	%	84.7
	Town and fringe	%	7.2
	Village	%	5.5
	Isolated dwelling	%	2.6
IDACI score	Income Deprivation Affecting Children from Census data	#	0.24
IMD score	Index of multiple deprivation from Census data	#	25.9

SOURCE: LSYPE. NOTE: Total sample 15,431 individuals. We also include regional variables for each of the 47 Local Learning Skills Councils (LLSC).

Household characteristics included whether the young person live with one of two adults in the household (30% of families reported that there was not a second parent in the household), the financial situation of the households as indicated by the main parent (47% reported that their financial situation was adequate, 45% reported just getting by and 8% reported facing difficulties), and household size. We also included

information about the type of housing, with 16% of young people living in council housing and 9% renting from housing association.

Finally, regional information include whether the young person lives in urban areas (85%), towns (7%), villages (5%) or isolated dwellings (3%), the Income Deprivation Affecting Children (IDACI) score and the Index of Multiple Deprivation (IDM) from census data, and the location according to the 47 local learning skills councils (LLSC).

The IDACI shows the percentage of children in each supper output area (SOA) that live in families that are income deprived (i.e. in receipt of Income Support, Income based Jobseeker's Allowance, Working Families' Tax Credit or Disabled Person's Tax Credit below a given threshold). The IDACI score of 0.24 means that 24% of children aged less than 16 in that SOA are living in families that are income deprived. The IMD is based on distinct dimensions of deprivation, which can be recognised and measured separately. The IMD has the following seven domains: income, employment, health and disability, education, skills and training, barriers to housing and services, living environment, and crime. Each dimension is measured independently using the best indicators available to generate a score, which then are combined to generate the IMD.

3.3 Characteristics of schools in the LSYPE

Access and intensity of ICT use in school may not be determined exclusively by individual, family and regional factors. There are also important school factors that can determine the use of computers at schools. The LSYPE provides school characteristics as well as information about young people's and parents' opinions about schools.

In terms of school characteristics, Table 2 indicates that 70% of young people attended community or community special schools in 2004, 15% attended foundation schools and 14% voluntary aided and voluntary controlled schools. The average Key Stage 3 score per eligible pupil was 33.8, with a range from 17 to 46.[1] We also have information on the FSM bands for schools. The bands comprise schools with different proportions of pupils eligible for free school meals, with 38% of pupils attending schools with less than 9% of pupils eligible for free school meals and 19% attending schools with over 35% of pupils eligible for free school meals. The average proportion of white pupils in schools is 72% and the average proportion of SEN pupils in LSYPE schools is 2.5%.

Table 2: Descriptive statistics about schools in LSYPE sample

Variable	Description	Units	Mean
	School Characteristics		

[1] The average points score is calculated for each subject as: Overall total points score/Total number of eligible pupils where overall total points score is the sum of the total points score for each level, calculated by multiplying the number of pupils at each level by the points score for that level; total number of eligible pupils is the sum of the number of eligible pupils at each level (disregarding pupils absent or unable to access the test).

Type	Community and Community Special	%	70.5
	Foundation	%	15.5
	Voluntary Aided & Controlled	%	13.9
KS3 score	Average (s.d.) KS3 point score per eligible pupil	#	33.8 (3.5)
FSM bands	Less than 5% pupils eligible for FSM	%	20.3
	Between 5-9% pupils eligible for FSM	%	17.9
	Between 9-13% pupils eligible for FSM	%	13.2
	Between 13-21% pupils eligible for FSM	%	14.7
	Between 21-35% pupils eligible for FSM	%	15.1
	Between 35-50% pupils eligible for FSM	%	11.7
	More than 50% pupils eligible for FSM	%	7.1
% White	Average (s.d.) proportion of white pupils in schools	#	72.0 (30.9)
% SEN	Average (s.d.) proportion of SEN pupils in schools	#	2.5 (1.5)
	Young people's perception on schools		
Satisfaction	Average (s.d.) satisfaction with school facilities (range from 2 to 16)	#	11.6 (2.2)
Quiet	Misbehaviour in most classes	%	31.2
Homework	Average (s.d.) number of evenings do homework	#	3.0 (1.4)
Teacher homework	Most teachers make sure young people do homework	%	71.5
Teacher control	Most teachers make sure that we behave	%	82.2
Teacher praise	Most teachers praises work	%	65.5
	Parents' information about schools		
Overall Satisfaction	Overall satisfaction with school quality by parents (range from 1 very good to 5 very bad)	#	1.7
Subjects	Parental satisfaction with subjects offered at school (ranges from 1 satisfied to 4 not satisfied)	#	1.6
Discipline	Parental satisfaction with school discipline (ranges from 1 satisfied to 4 not satisfied)	#	1.8
Access	Parental satisfaction with accessibility of teachers at school (ranges from 1 satisfied to 4 not satisfied)	#	1.8

SOURCE: LSYPE. NOTE: Total sample 15,431 individuals.

Young people reported their satisfaction with school, which adds all their ratings regarding general facilities, toilets, sports, availability of books, and library. The range of this rating is 2 to 16, with an average rating for schools of 12. Young people also rated the frequency of misbehaviour of other pupils in the classroom, with 31% reporting misbehaviour in most classes. On average, young people reported doing homework for 3 days a week. Finally, young people rated their teachers in terms of the proportion of teachers that checked homework (71%), that kept control in classroom (82%), and that praised school work (65%).

Finally, parents rated overall satisfaction with their children's school to be good (1.7), to be satisfied with subjects offered at school (1.6),with school discipline (1.8), and the accessibility of teachers in the school to allow for parental involvement (1.8).

3.4 Risk outcomes in the LSYPE

An interesting use of the LSYPE is the link between ICT use and the prevalence of high cost, high harm outcomes for young people. Table 3 shows a list of different outcomes selected from the data. There are two educational outcomes, one is a measure of educational expectations (with 12% of young people not wanting to continue in education after the age of 16) and the other is whether the young person is registered as a special education needs (with 20% of young people identified as SEN). For persistent truancy and exclusion we have three different indicators, one is frequency of truancy (5.2% of young people play truant frequently), another being suspended from school more than once (3.9%) and finally being expelled from school (0.7%).

Table 3: Young people's outcomes – summary statistics

Type of Outcome	**Description from the LSYPE**	**Proportion**
Educational	YP does not want to stay in schooling post 16	12.0%
	YP is identified as special education needs	19.0%
Care	YP has ever been in care	2.2%
Persistent truancy / exclusion	YP plays truant frequently	5.2%
	YP has been suspended from school more than once in the last 3 years	3.9%
	YP has been expelled or permanently excluded from school	0.7%
Substance and alcohol abuse	YP smokes cigarettes frequently	6.1%
	YP drinks alcohol more than 3 x a month	2.9%
	YP has ever tried cannabis	8.8%
Anti-social behaviour	YP has written on walls with spray	6.6%
	YP has smashed public property	10.0%
	YP has stolen goods from shops	11.8%
	YP has taken part in fights	18.7%
	YP frequently misbehave in class	7.8%
Involved in crime	Main parent has been contacted by police due to YP actions	7.8%

Young people also reported information about substance use, with 6.1% of young people smoking cigarettes frequently, 3.2% drinking alcohol more than 3 times per month and nearly 9% had tried cannabis. For anti-social behaviour we have five different measures, such as writing in walls with spray (7%), smashing public property (10%), steeling goods from shops (12%), taking part in fights (19%) and misbehaving in class (8%). Finally, parents reported whether they have been contacted by the police due to their children's actions (8%).

4 Estimation methods

In order to investigate the characteristics of young people in England who have access to computers at home, computers at school and mobile phone we relied on estimation methods for categorical outcome variables. When our outcome variable of interest is binary, for example whether the young person owns a mobile phone or not, we utilised logit models to estimate parameters. When our outcome variable of interest has multiple ordered categories, for example whether the young person uses computers at school for less than 1 day a week, between 1 and 2 days per week, or more than 2 days per week, we used ordered logit models to estimate parameters (see Greene 1997 for full specification of the logit and ordered logit models).

Parameters in the logit model are interpreted as increasing or decreasing the likelihood that young people belong to each of the categories. Parameters in the ordered logit model are interpreted as increasing or decreasing the likelihood that young people belong to each of the ordered categories. For both models we quantify the impact of the variables on the probability of each outcome by using odd ratios. An odds ratio of 1 implies that the outcome variable is equally likely in both groups under consideration. An odds ratio greater than one implies that the outcome variable is more likely in the first group whereas an odds ratio less than one implies that the outcome variable is less likely in the first group.

We do not report every single parameter or odd ratio from our estimations. Instead, we summarise the main results with the use of plots that include the estimated parameter and confidence interval for the main variables in the analysis. For use of computers at home we focused on the main individual and household level factors; for use of computers at school we focused on significant factors only; for mobile phone ownership we also focused on individual and family level factors only; and finally for young people's views on the value of computers we focused on individual factors only.

5 Results

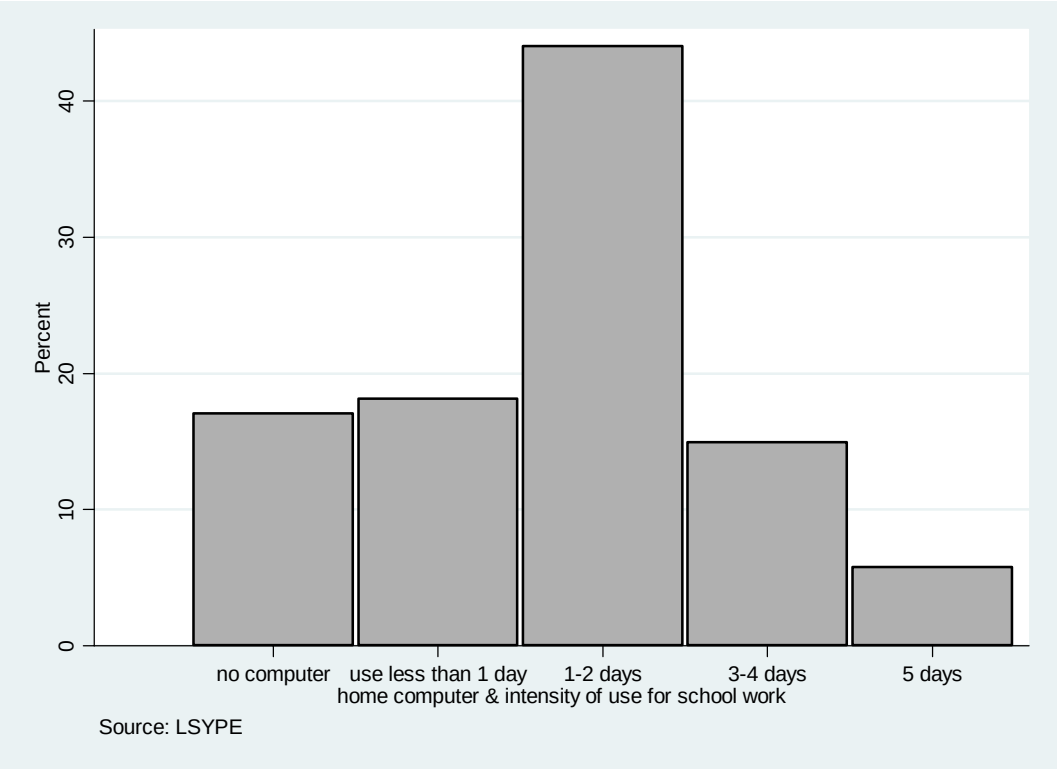
Results from this report are reported in %% sections. In the first section we report results from use of computers at home, followed by use of computers at schools. In the third section we combined use of computers at school and at home and investigate differences between young people's use of computers. The fourth section we reported results from mobile phone use and the last section we investigate whether ICT use is associated with other risk factors in the lives of young people.

5.1 ICT use at home

Our main outcome variable for use of computers at home combines information on access (whether computer is available at home) with intensity (how many days, on average, home computer is used for school related work). Of the total of 14,290 young people who completed the section on use of ICT, 17% reported not having access to a computer at home, and a further 18% reported having computer at home but using it for less than one day per week on average for school related work (see

Figure 1). The majority of young people (44%) use computers at home between 1 and 2 days per week, on average, for school related work, 15% use computers on average 3 to 4 days a week and finally 6% use computers for school related work almost everyday of the week.

Figure 1: Access and use of computers at home for school related work



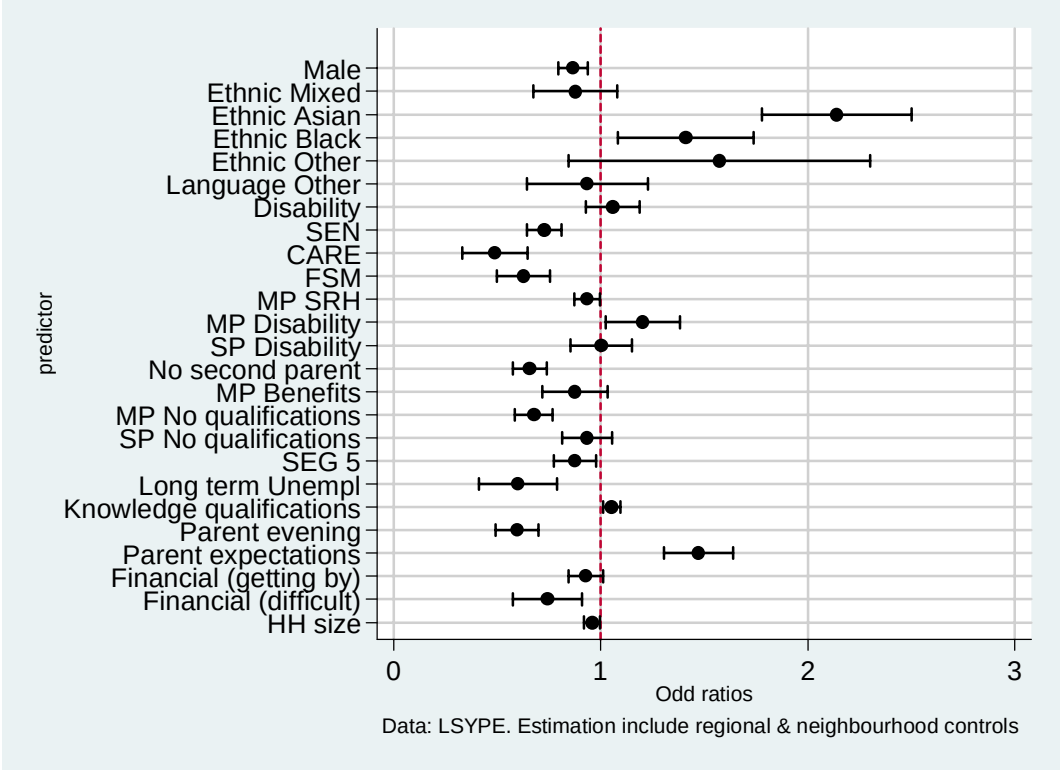
How different are these young people in terms of their use of computers at home for school related work in terms of individual and family background characteristics, controlling for regional factors? Figure 2 provides results from the ordered logit estimation on use of computers at home. We find an important gender gap in the use of computers at home, whereby boys are less likely than girls to use computers for school related work. The odds of increasing use of computers at home for school related work for boys relative to girls are 0.84.

We also find a gap in use of computer at home for school related work based on ethnic background. Compared with young people from white ethnic background, Asian and black have higher odds of increasing use of computer at home for school related work. We do not find any difference between white and mixed ethnic background or between white and other ethnicities with respect to use of computers at home.

We further find that young people with special education needs (SEN), who have been in care and those eligible for free school meals (FSM) have lower odds of increasing use of computers at home for school related work. In one way or another, these are all indicators of disadvantage and are all related with the lack of computers use at home.

Furthermore, for young people whose parents reported worse health status the odds for computer use at home are lower than for those whose parents have better self-reported health (0.93), however young people whose main parent or carer has a long standing illness or disability have 20% higher odds to use computer at home than the rest of the sample.

Figure 2: Odd ratio estimates of background factors on use of computers at home for school related work



Findings also suggest that lack of computers use at home is associated with different indicators of parental socioeconomic background. In particular, whether the main parent or carer does not have any formal qualifications is associated with 33% lower odds of computer use at home by young people, whether parents work in routine or semi-routine occupations is associated with 12% lower odds of computer use at home by young people and whether the parents of the young person are in long term unemployment is associated with 41% lower odds of computer use for school related work by young people.

Interestingly, it is not only who parents are but also what they do that is associated with the lack of computer use at home by young people. In particular, we found that whether the main parent has knowledge about current qualifications to give advice to the young person, parental interesting in the young person's schooling and parental expectations about young persons' staying on in education were all associated with use of computers at home for school related work. Young people whose parents had knowledge of modern qualifications and whose parents expected them to stay in full-time education had 5% and 47% higher odds of computer use at home, respectively.

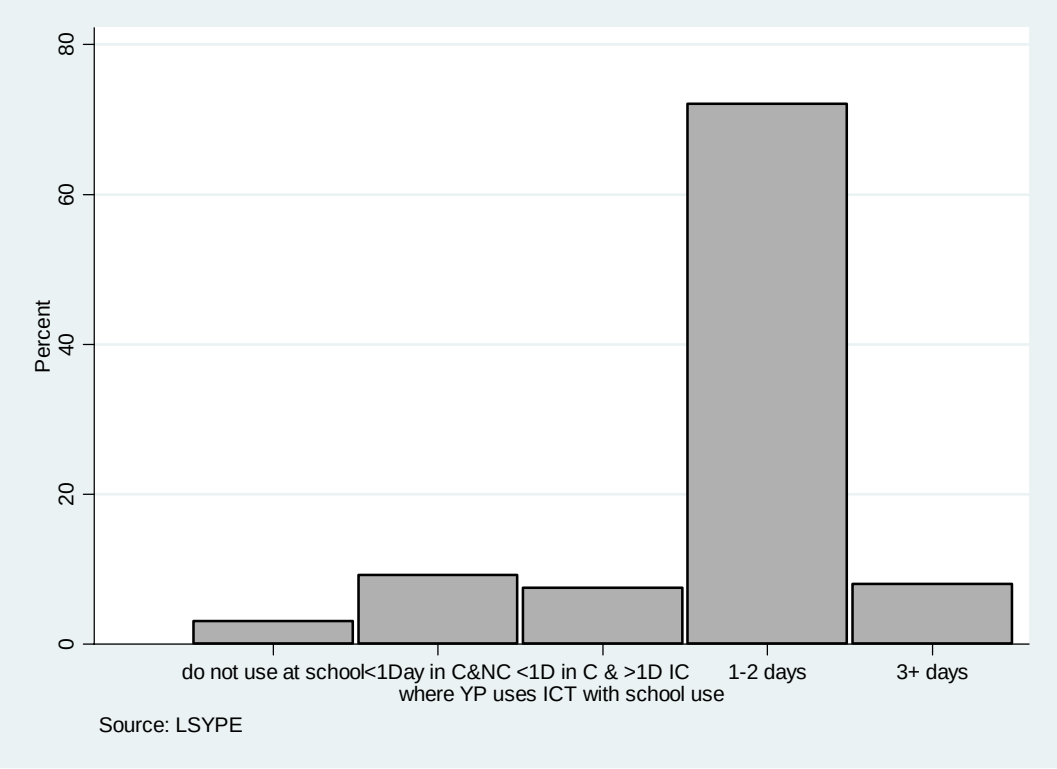
Young people whose parents did not attend parents' evenings had 41% lower odds of using computers at home for school related work.

Finally, we also have information about possible income barriers for use of computers at home, whereby young people living in households facing financial difficulties are less likely to use computers at home for school related work (possibly because they are also more likely to have access to computers at home, but this is captured by our definition of access and intensity of utilisation of computers at home). Young people who live with only one parent have 35% lower odds to use computers for school related work.

5.2 ICT use at school

Our main outcome variable for use of computers at schools combines information on access to computing and non-computing lessons with intensity (how many days, on average, computer is used for computing and non-computing lessons). Of the total of 15,431 young people who reported information regarding use of computers at schools, only 478 (around 3%) do not use computers at school (see Figure 3). A further 9% use computers at school for less than 1 day a week, on average, for computing and non-computing lessons and 7% use computers for less than 1 day a week, on average, for computing lessons for more than 1 day a week, on average, for non-computing lessons. The vast majority of young people, 72%, use computers at school on average for 1 to 2 days for computing lessons (regardless of their time use during non-computing lessons) and 8% use computers at school on average 3 or more days a week for computing lessons (regardless of their use for non-computing lessons).

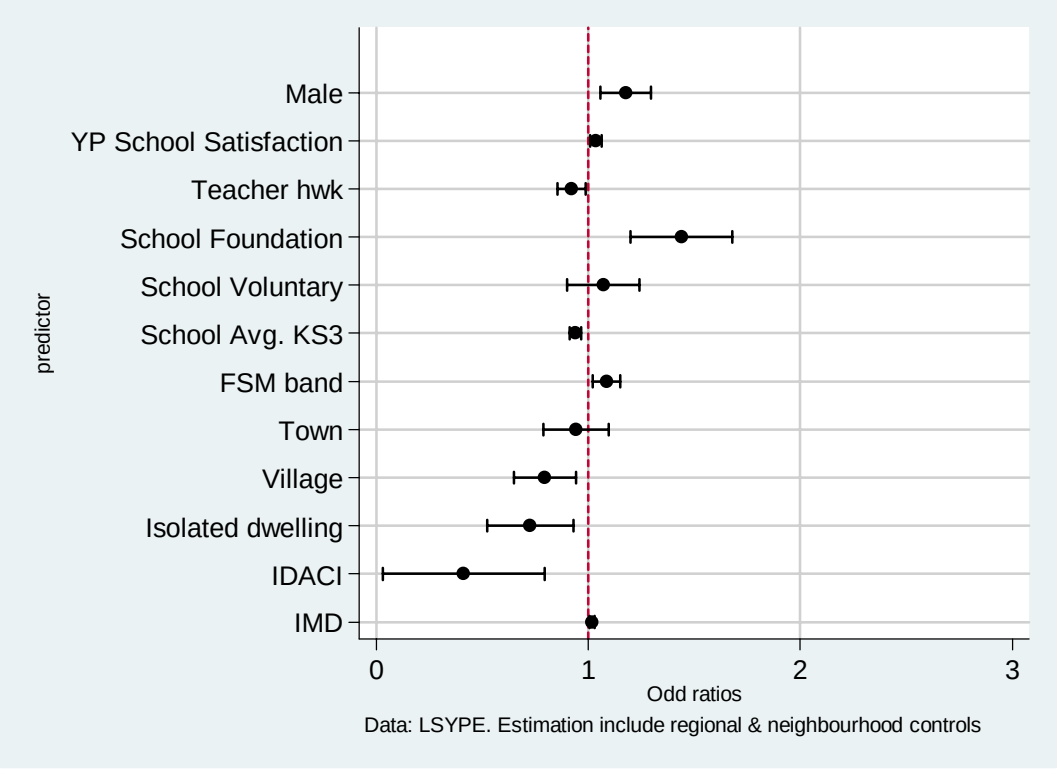
Figure 3: Access and use of computers at school



We find very few factors that predict differences in use of computers between schools (Figure 4). With respect to individual and family characteristics, we only find a gender gap, which interestingly is different than the gender gap for access and use of computers at home. Boys have 17% higher odds of computer use at school than girls. None of the other socioeconomic factors, which may be thought to be related to use of computers at home (for example parental socioeconomic status or parental education), were significant on the model once we controlled for school and regional factors.

With respect to school indicators, we find that higher satisfaction of young people with their school facilities was also associated with greater utilisation of computers and the lower the proportion of teachers that, according to the young person, make sure that homework is done is associated with lower odds of use of computers at schools. This two results are possibly associated with how students perceive school quality, and could indicate that lack of computer use is associated with negative views on school by young people.

Figure 4: Odd ratio estimates of individual and school factors on use of computers at school (only significant factors)



Note: Individual and family level factors found not to be statistically significant: ethnicity, language, SEN status, FSM eligibility, whether the young person has a long standing illness or disability, main parent health, parental illnesses or disabilities, parental education, socioeconomic status, unemployment, main parent in receipt of benefits, financial difficulties at home, parental knowledge on qualifications, parental expectations, parental interest on schooling, household size, or housing.

Finally, most of the variation in use of computers at school is from school indicators and regional differences. Foundations schools have 43% higher odds to use computers at school compared with community schools, whereas voluntary aided school have similar odds of computer use at school than community schools. Interestingly, we find that higher attainment in school is not associated with greater use of computers, but rather the opposite. The odds of computer use at school decrease by 6% per unit of attainment. In line with this result, we also find that higher proportion of FSM students in schools is associated with greater utilisation of computers.

Other area level factors are important in the determination of use of computers at schools. Compared with urban areas, young people living in villages and isolated dwellings have 20% and 28% lower odds of computer use at schools, respectively. The higher the proportion of children in super output areas that live in families that are income deprived the lower the odds of computer utilisation in schools, however the higher the IMD score, the higher the odds of utilisation of computers at school.

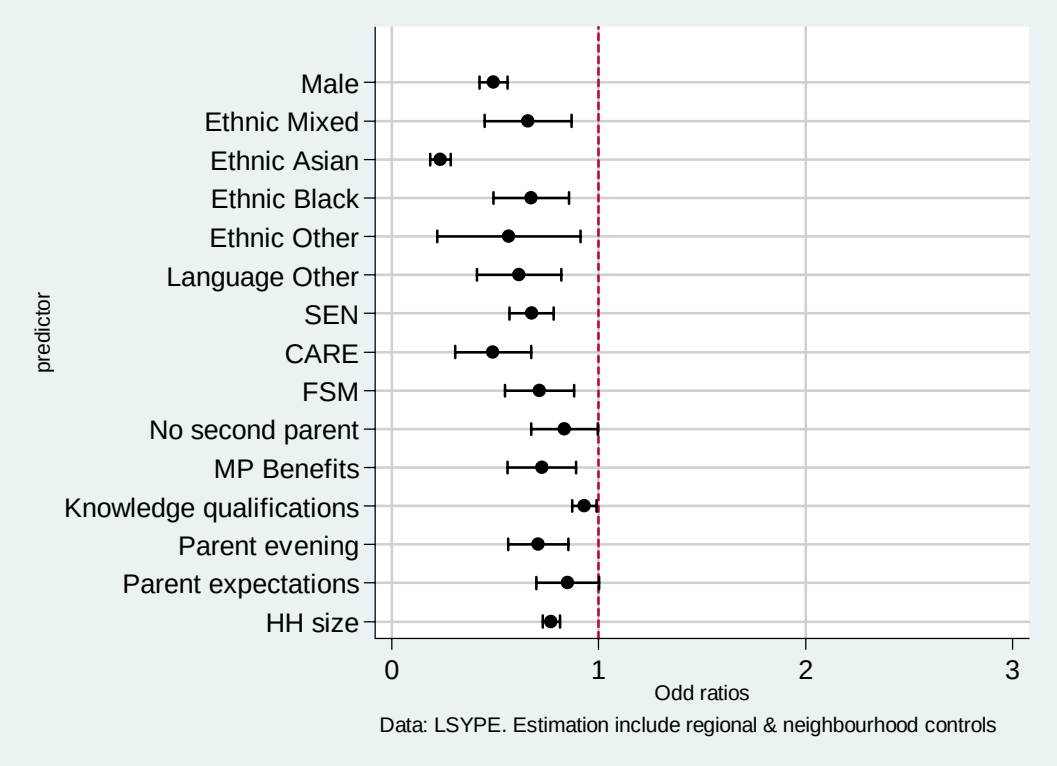
5.3 Mobile phone ownership

Our outcome variable in this section is mobile phone ownership. Of 15,425 young people in the sample 81% owned their mobile phone. Figure 5 shows the results of the factors that remain statistically significant associated with mobile phone ownership

after controlling for individual, family and area level characteristics. We find that boys have 50% lower odds of mobile phone ownership than girls, indicating an important gender gap for mobile phone ownership among 14 year olds. There are also important ethnic gaps, with most ethnic groups being less likely than whites to own a mobile phone. In particular Asian young people have 77% lower odds of mobile phone ownership compared with young people of white ethnic origin. Also related to ethnicity, language used at home is also associated with mobile phone ownership, whereby not speaking English at home as a first language is associated with 38% lower odds of mobile phone ownership.

Young people being identified as special education needs, eligible for FSM or who have been in care are less likely to own a mobile phone. In particular, the odds of mobile phone ownership for SEN students compared with other students are 0.67, for FSM students compared with non-FSM students 0.71, and for those who have been in care compared with not in care 0.49. Young people who live with only one parent have 17% lower odds of mobile phone ownership and those whose main parent is on income or unemployment benefits have 25% fewer odds of mobile phone ownership. Children living in large households have lower odds of mobile phone ownership.

Figure 5: Odd ratio estimates of individual and family factors on mobile phone ownership (only significant factors)



Note: Factors found not to be statistically significant: whether the young person has a long standing illness or disability, main parent health, parental illnesses or disabilities, parental education, socioeconomic status, or unemployment, financial difficulties at home or housing.

Interestingly, we again find that parents expectations, knowledge on qualifications and their interest on the young person's schooling are associated with mobile phone ownership (whereas parental education, financial situation, socioeconomic position and employment status are not). Young people whose parents agree that they know current qualifications to give advice have lower odds to own a mobile. Similarly, young people whose parents expect them to continue in education have 15% lower odds of mobile phone ownership. However, lack of parental interest is negatively associated with mobile phone ownership.

5.4 ICT use and outcomes of multiple deprivation

Table 4 shows the associations between lack of access to computers at home, lack of access to computers at school and no mobile phone ownership with other outcomes of multiple deprivation. All estimations include controls for individual characteristics (excluding the ones that directly measure young people's outcomes for example whether the young person has been in care), family factors and regional controls. For access to computers at school we also include school specific controls.

For lack of access to computers at home, we only differentiate between young people who do not have access to computers at home (16%) versus those who have access. For access to computers at school, we only differentiate between the 3.1% who do not have access to computers at school versus schools who have computers, and finally, for mobile phone we focused on the 19.4% who do not own their mobile phone versus those who have mobile phone.

With respect to the lack of access to computers at home, we find that young people who do not have computers at home are also likely to have other risk factors (Table 4). In particular, these young people have also higher odds of not staying in education post age 16, being identified as SEN, to have been in care, to play truant frequently, to have been suspended or excluded from school, to smoke, drink, or have anti-social behaviours and also for their parents to have been in contact by the police due to the young person's actions.

This is not the case for lack of computers access in schools and other outcome of deprivation. We only find that young people who do not have access to computers at schools are also more likely not to stay in post-compulsory education (odds=1.68) and more likely to have been excluded from school. Although we remain cautious that there are very few cases of exclusion and lack of computers at home and this may be driving this result.

Table 4: Odds ratio (z-statistic) for likelihood of ICT use by multiple risks

	No access to computer at home	No access to computer at school	No mobile phone
YP not stay on post 16	1.67 (5.44)**	1.68 (2.11)**	1.11 (1.06)
YP is SEN	1.55 (5.91)**	0.96 (-0.16)	1.50 (5.48)**
YP ever in care	1.93	1.52	1.97

	(3.52)**	(0.87)	(3.53)**
	1.76	1.38	1.21
YP truant frequently	(4.70)**	(1.00)	(1.48)
	1.72	1.14	1.42
YP suspended school	(3.99)**	(0.28)	(2.45)**
	2.85	7.31	2.60
YP excluded school	(3.54)**	(2.86)**	(3.31)**
	1.75	1.35	1.22
YP cigarettes frequently	(5.32)**	(1.09)	(1.63)
	1.36	1.01	1.05
YP drinks alcohol 3xmonth	(1.93)	(0.04)	(0.28)
	1.54	0.96	1.07
YP has ever tried cannabis	(4.48)**	(-0.14)	(0.69)
	1.48	1.24	1.22
YP written on walls with spray	(3.67)**	(0.74)	(1.78)
	1.30	1.17	1.00
YP smashed public property	(2.85)**	(0.64)	(0.05)
	1.45	1.11	1.07
YP stolen goods from shops	(4.23)**	(0.48)	(0.78)
	1.26	1.23	0.78
YP fights	(3.02)**	(1.13)	(-3.05)**
	1.72	1.08	1.37
Police contact	(5.40)**	(0.27)	(3.01)**

Source: Longitudinal Survey of Young People in England. Odds ratios are compared against young people who have access to computers at home, access to computers at school or own their mobile phone. Asterisks (**) indicate statistically significance at 5% level from the comparison group.

Finally, lack of mobile phone ownership is associated with only 5 of the 14 other outcomes of deprivation. We also find that lack of mobile phone ownership is negatively associated with the young person's fighting, perhaps due to the large gender difference in mobile phone ownership and the fact that men are more likely to be involved in fights than women. In any case, lack of mobile phone ownership in our analysis does not seem to be associated with as many outcomes of deprivation as lack of computer at home.

5.5 Value of ICT for school work

In this final section we investigate the characteristics of young people who think that use of computers is important in helping do well at school. Of the total sample, 14% of young people thought that computers were not important at all for school work, 54% thought that computers were fairly important and finally 32% thought that computers were very important in helping do well at school.

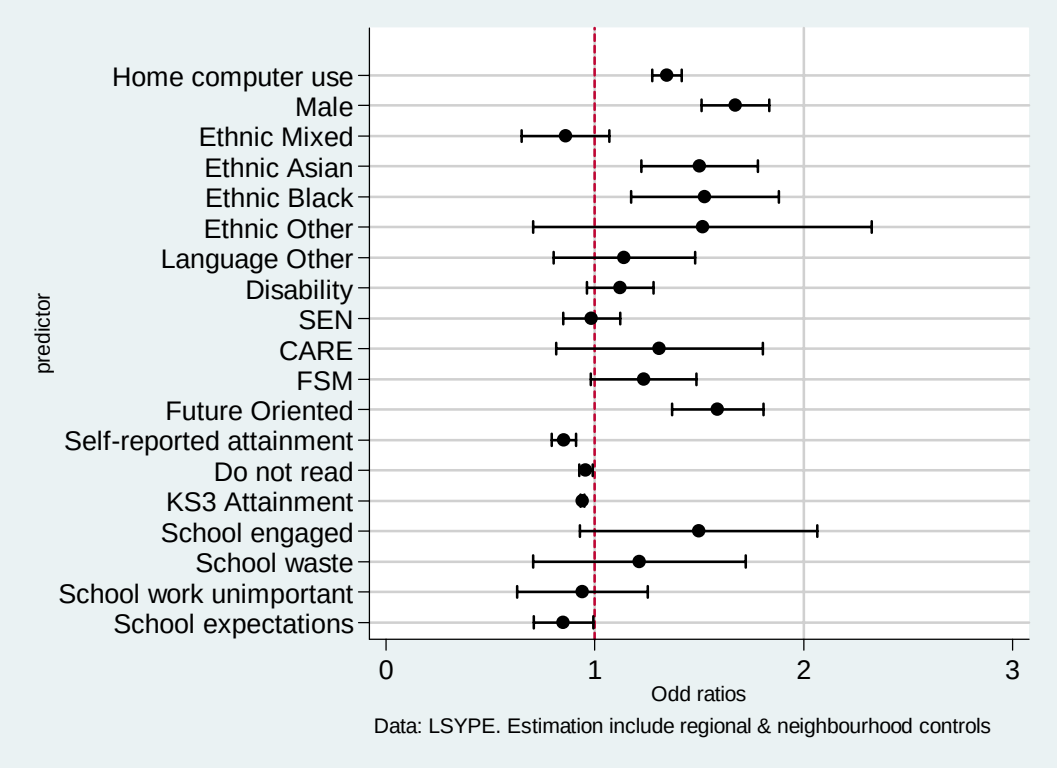
We relate young people's views to other individual characteristics, conditioned on family and neighbourhood factors (Figure 6). Apart from the individual factors utilised for the sections on use of computers, we also include whether the young person uses computer at home and information about her values, beliefs and competencies. Among these latter variables, we include future orientation, measured by young people belief that subjects studied at school are important for future career, self-rated school attainment, the frequency that young people read for pleasure, their overall objective school attainment, whether young people are happy at school, think

that school is a waste of time, think that school work is worth doing, and have expectations to continue in education.

Results from the analysis are shown in Figure 6. We found that use of computers at school is associated with young people's views that computers are important for doing well at school. Those who own computers and use it for school related work have 34% higher odds to believe that computers are important to do well at school. We found a gender gap in the value that young people place to the importance of computers, with boys thinking that computers are more important to do well at school than girls. We also find an ethnic difference with respect to the value of computers, with young people from Asian and Black ethnic minorities valuing computers more than white young people.

But the most important result deals with the fact that it is not the social background characteristics of young people that predict their valuing of computers, but other values, beliefs and competencies that are important. For example, we do not find any differences in young people responses that computers are important by SEN or FSM eligibility. Nor we find that young people parental background (in terms of financial or work status, socioeconomic position, or education) is important in predicting young people responses on the value of computers.

Figure 6: Odd ratio estimates of individual factors on young people views about the importance of computers (only individual level factors)



Note: The only family factor found to be associated with young people's views on the value of computers was household size, with young people living in large households placing higher importance to computers to do well at school. All other family and neighbourhood factors were found not to be statistically significant.

Young people who are future oriented have 66% higher odds to believe that computers are important in helping them do well at school. Young people to do not read for pleasure, who do not think that they are good at school, and with lower overall KS3 scores have 17%, 6% and 5% lower odds to respond that computers are important in helping do well at school. Finally, school expectations matter, with young people not wanting to stay on in education being less likely to report that computers are important in helping them do well at school.

6 Conclusions

This report investigated the use of ICT by young people in England. In particular, we focused on access and use of computers at home, access and use of computers at school in organised learning, and mobile phone ownership. For each of these three indicators of ICT use, we investigated the main individual, family, school that predict differences, conditioned on the region where young people live.

For use of computers at home, we combined access and number of days that the computer is used for school related work. For this cohort of 14 year olds, we found that 17% reported not having access to a computer at home, and a further 18% reported having computer at home but using it for less than one day per week on average for school related work. Although lack of access of computers at home is not necessary associated with lack of use of technologies in the home, such as television and videos (Wheelock, 1992) or with the resources to support the acquisition of ICT confidence at home (Sutherland, et al. 2000), this is a relatively high proportion of young people who either do not have computers at home or do not use it enough for school related work.

Gender differences in the time of computer use at home has been found to be one of the most prominent factors of inequality in access (Volman and van Eck, 2001). Interestingly, Kent and Facer (2004) found that more boys than girls reported digital activities outside the school. In particular, boys were more likely to report playing with games and Internet activity. However, girls were more likely to report writing with computers at least once a week. This latter finding is more consistent with our result, which highlights that boys aged 14 in 2004 were less likely to use home computers for school related work. However, it is possible that gender differences for use of computers at home for recreational purposes are more frequent for boys than for girls.

Lack of use of computers at home for school related work was associated with social background characteristics of the young person. In particular, it was associated with special education needs, being in care, or being eligible for free school meals. It was also associated with different indicators of parental socioeconomic background, such as low education, low occupation, unemployment and financial hardship. Facer and Furlong (2001) also found an important socioeconomic gradient with respect to home computer ownership in their sample of children in Southwest England and South Wales. They found that 70% of children reported home ownership by 2000 and that, among these, 80% of high income and 54% of low income families reported ownership of computers at home.

Interestingly, our research found that it is not only who parents are but also what they do that is associated with the lack of computer use at home by young people. We found that parental knowledge about current qualifications to give advice to the young person, parental interesting in the young person's schooling and parental expectations about young persons' staying on in education were all associated with use of computers at home for school related work. Similarly, Facer and Furlong (2001) found that the existence of family culture that identifies a cultural, educational or economic value in computer use will increase the likelihood of parental provision of ICT in the home. In Australia, Downes (2002) also found that parental attitudes towards computers as well as parental expertise in ICT determined access to computers at home for children.

Gender inequality still exist in access and use of computers at school, with boys being more likely to report use of computers at school in computing and non-computing lessons. This result is consistent with findings from Kent and Facer (2004), who reported that boys were more likely to report being involved in playing games and using the Internet at school. Apart from gender, we found very few individual and family background differences in access to computers in computing and non-computing lessons in school. This may be partly due to the increase in the provision of computers in schools, as the UK policy initiatives have aimed at ensuring wide access to ICT (Facer and Furlong, 2001).

Among the main determinants of the difference in use of computers at school we found type of school as well as area level differences. Type of school may relate to school ethos or the importance that certain schools give to technology. For example, young people in Foundation schools were more likely to access and use computers than young people in community schools. Area level inequalities in access were still apparent for this cohort of young people, with young people living in villages and isolated dwellings have 20% and 28% lower odds of computer use at schools, respectively, compared with young people living in urban areas.

Research has revealed that the mobile phone is, for adolescents, a medium which permits communication (Davie, Panting, Charlton, 2004), and means for social inclusion (Adams and Fitch, 2006). In this paper we found that lack of mobile phone ownership was associated with different aspects of disadvantage, among which we found special education needs, being in care, eligible for free school meals, not having a second parent in the home, having parents in income or unemployment benefits, parents lacking qualifications, lack of parental interest in schooling, lack of parental expectations for the young people's educational attainment and young people living in large households.

However, a remarkable result was found when comparing individual outcomes of deprivation for young people and access to ICT. Lack of access to computers at home was associated with 14 outcomes of deprivation whereas lack of mobile phone ownership was associated with only 5 outcomes of deprivation. In particular, young people who do not have access to computers at home were more likely not to stay in education post age 16, being identified as SEN, to have been in care, to play truant frequently, to have been suspended or excluded from school, to smoke, drink, or have anti-social behaviours and also for their parents to have been in contact by the police due to the young person's actions.

With respect to the value that young people place to computers we found that social background characteristics are not as important predictors as other values, beliefs and competencies, in particular with learning. For example, we did not find SEN or FSM eligibility differences, or parental background in predicting young people responses on the value of computers, but future orientation, reading for pleasure, attainment and educational expectations did.

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