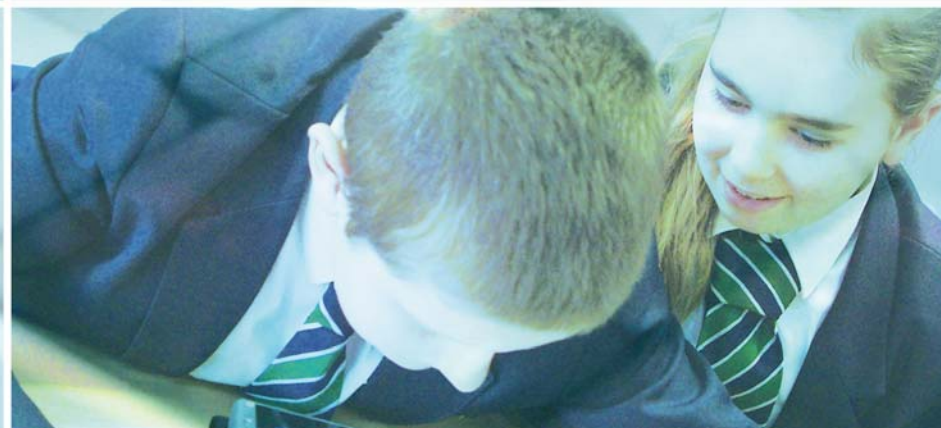




Survey of LAN infrastructure and ICT equipment in schools



Contents

Introduction	2
How the survey was conducted	3
Acknowledgements	4
Further information	4
The findings	5
ICT procurement and usage policies	5
Connectivity	8
Infrastructure services	14
Data services	37
Learning services	38
Progress and challenges	43



Introduction



As part of Becta's ongoing work of advising Government and developing technical standards, we investigated how schools compare to current standards such as the institutional infrastructure technical specification. The objectives of the survey were to help policymakers and to inform the strategy for engaging schools in adopting the standards.

Becta commissioned the survey based on visits to schools by ICT specialists to collect data relating to ICT equipment and associated services. The survey covered not only the quantities and specifications of equipment in schools, but also information relating to equipment providers, the management of the equipment, and policies in place in schools with respect to its purchase, use and disposal.

The sample for the survey was specifically chosen to be representative of the population of schools in England.

How the survey was conducted

Sample selection

The sample of 556 consisted of maintained primary schools, secondary schools, special educational needs (SEN) centres and pupil referral units (PRUs) in England. In order to obtain nationally representative sample sets of these schools, it was necessary to choose schools that met specific criteria. The criteria we used were:

- School type (primary, secondary, SEN or PRU)
- School size – large, medium or small (by numbers of pupils)
- Levels of deprivation – high or low (based on the percentage of pupils receiving free school meals and cross-checked with the Indices of Deprivation 2004)
- Rural/urban status (Edubase categorisation)
- Geographical location (by government office region).

The national population of schools was sorted into the above categories, and the required number of 550 divided up into similar proportions within each of the nine government office regions. Twelve categories of school were defined for both primary and secondary schools, as identified opposite.

Small rural low deprivation	Medium rural low deprivation	Large rural low deprivation
Small urban low deprivation	Medium urban low deprivation	Large urban low deprivation
Small rural high deprivation	Medium rural high deprivation	Large rural high deprivation
Small urban high deprivation	Medium urban high deprivation	Large urban high deprivation

For the purposes of this survey, we treated middle schools as ‘deemed’: either ‘middle deemed secondary’ or ‘middle deemed primary’.

We contacted around 2,500 schools to obtain the required 550 surveys (in fact, the final number was 556). Our initial contact was by letter and then by follow-up phone call.

The final numbers of schools taking part in the survey were:

- 306 primary
- 221 secondary
- 29 SEN/PRU.

In the secondary schools sample we originally intended to include a proportionate number of specialist schools, but we found it impossible to gain the agreement of enough specialist schools.

Data collection

Because of the technical nature of much of the data, we commissioned IT professionals to visit each of the schools. Following a formal tendering process, Atkins Management Consultants were commissioned to undertake the work.

The company was responsible for arranging the school visits – either a full day or a half day, depending upon the size of the institution. We reimbursed schools the cost of cover for the staff time taken up by the visit.

The data was collected using paper questionnaires, and then transferred to a database. During the data-collection period, Becta carried out a number of quality checks by making return visits to schools, and we vetted all data as a required part of the process.

Acknowledgements

Further information

Acknowledgements

Becta would like to extend warm thanks to all the schools that agreed to take part in the survey, and particularly to the members of staff who helped us in the data collection.

As an additional thank-you, we gave each school an individualised report showing how it compared with its peers and, where possible, with published Becta standards.

Further information

If you are seeking further information related to areas covered in this report or simply an explanation of terms we have used, you may find the following links helpful.

The full survey data is available in *Survey of LAN infrastructure and ICT equipment in schools 2005* which is published on Becta's Government and Partners website [<http://www.becta.org.uk/partners/research>]. To locate the document, look in the 'Reports and publications' section.

The *Becta Review 2006* contains findings from recent large-scale surveys and research studies with the aim of assessing the progress of ICT in education at a national level. Available to order or download from Becta publications [<http://becta.org.uk/publications>]

Becta's Industry and Developers website [<http://industry.becta.org.uk>]

For information about the national digital infrastructure, go to the 'Strategy' section.

For Becta's functional and technical specifications for institutional infrastructure, look in the 'Standards and specifications' section. Appendix D of the Technical specification contains a glossary of the terms used in this report.

The findings

ICT procurement and usage policies

This section looks at some of the management lifecycle aspects of ICT in schools – for example how ICT is purchased, whether schools are using aggregated purchase mechanisms, and how often they refresh ICT equipment. In addition, this section examines management policy on how the school uses ICT and how the equipment is disposed of at the end of its useful life.

We found that responsibility for procurement decisions resides primarily with both the headteacher and the ICT co-ordinator.

In all types of school, the primary method of purchasing ICT equipment was for the school to use its own internal methods, with comparatively little use of aggregated purchases with other schools or with local authority or regional broadband consortia (RBCs) or under other agreements. The same is true of networking equipment, support and maintenance services, and software purchases, for which the results were virtually identical to that for workstations, servers and peripherals, as indicated in figure 2.

Figure 1 Who is responsible for procurement decisions?

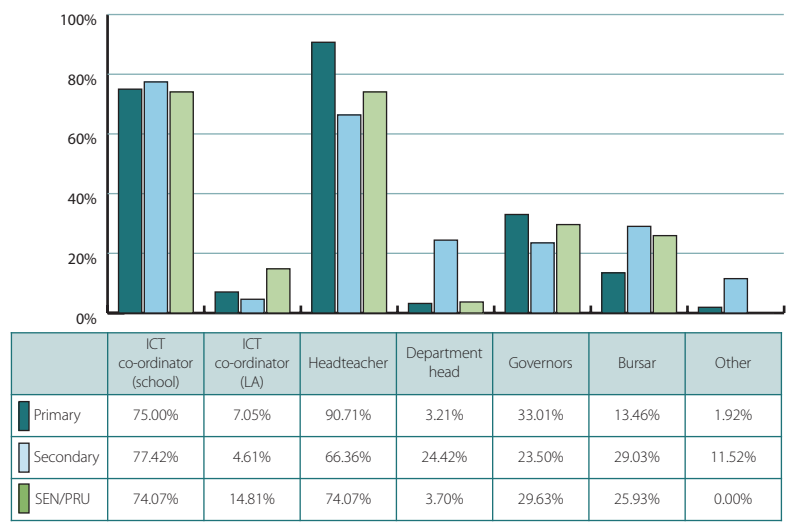


Figure 2 Purchase methods for workstations, servers and peripherals

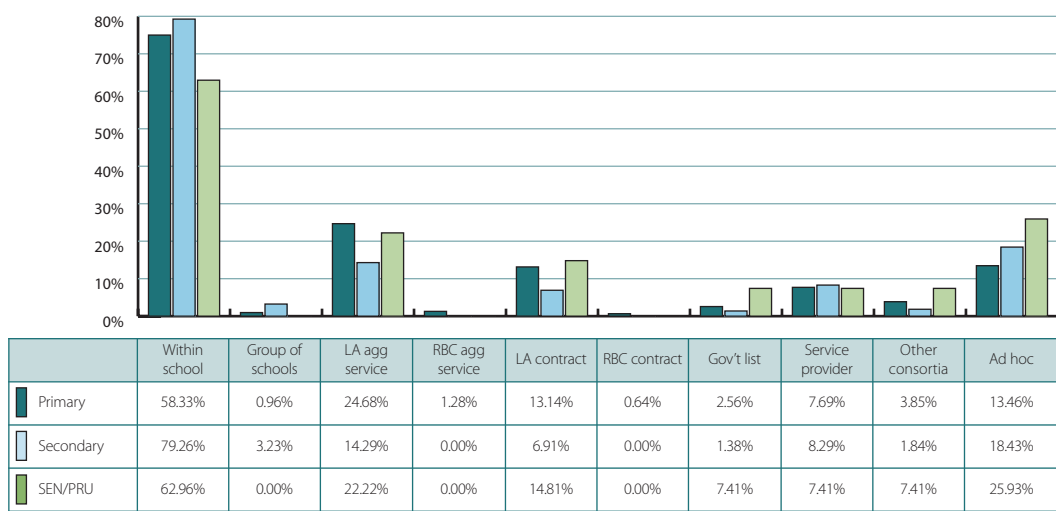
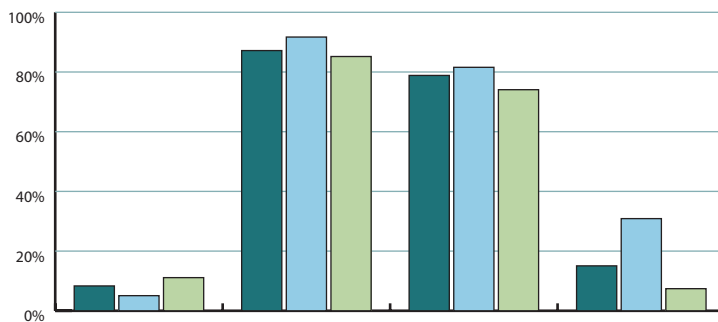




Table 1 School workstation replacement policy based upon refresh each year

	None		0–25% of workstations		26–50% of workstations		51–75% of workstations		75% + of workstations		Not known	
Primary	174	55.77%	99	31.73%	32	10.26%	1	0.32%	0	0.00%	6	1.92%
Secondary	95	43.78%	5	43.78%	24	11.06%	1	0.46%	2	0.92%	0	0.00%
SEN/PRU	16	59.26%	7	25.93%	4	14.81%	0	0.00%	0	0.00%	0	0.00%

Figure 3 AUP or SOP for ICT equipment in place



	None	Pupils	Staff	Adult/community
Primary	8.33%	87.18%	78.85%	15.06%
Secondary	5.07%	91.71%	81.57%	30.88%
SEN/PRU	11.11%	85.19%	74.07%	7.41%

Schools were asked if they had a policy for the annual replacement of workstations and, if so, approximately how many (expressed as a percentage of the total number of workstations). The results indicate that around half of all schools have no formal replacement policy in place.

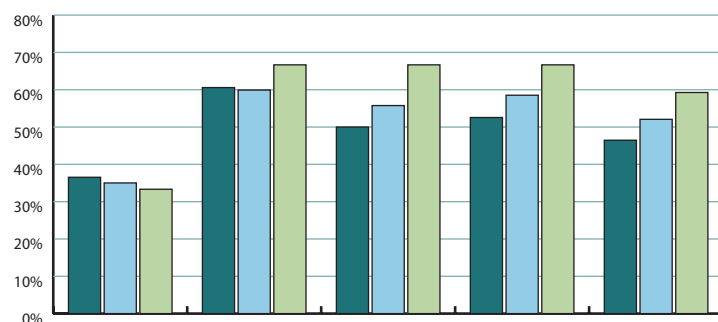
Pupil-to-PC ratios

We found that the number of workstation PCs available for teaching and learning was consistent with other published statistics: in primary schools the ratio was 7.09 pupils to 1 PC, in secondary schools 4.3 to 1 and in SEN/PRU schools 2.61 to 1.

We asked whether schools had an acceptable use policy (AUP) or any system operating procedures (SOP) in place that covered appropriate use of ICT equipment and the internet by its users. The results (see figure 3) show that while these exist for staff and pupils, where the school facilities are made available to adult or community users there is a lower level of coverage.

Figure 4 shows how many schools reported having a documented policy to cover the use of their ICT equipment with respect to complying with health and safety requirements.

Figure 4 Schools with documented policy covering safe use of equipment



	None	Display screens	Keyboard	Seating	Environment
Primary	36.54%	60.58%	50.00%	52.56%	46.47%
Secondary	35.02%	59.91%	55.76%	58.53%	52.07%
SEN/PRU	33.33%	66.67%	66.67%	66.67%	59.26%

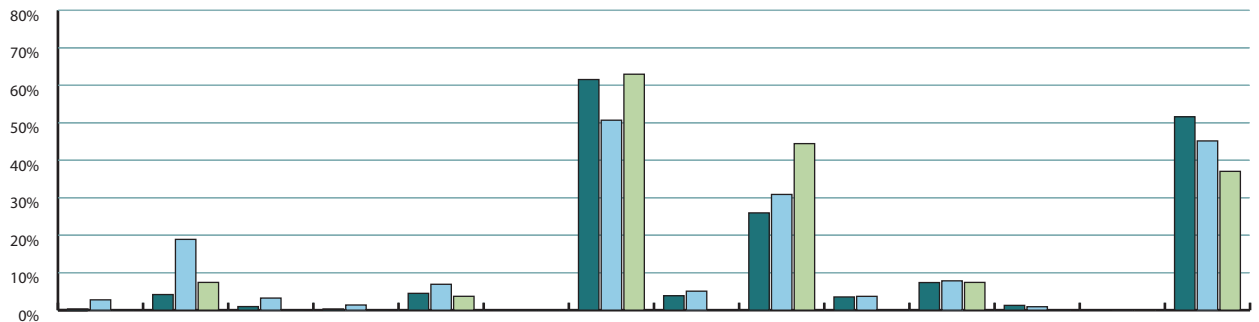
Table 2 indicates the numbers of schools having a documented policy on the safe disposal of ICT equipment.

Table 2 Documented safe disposal of ICT equipment policy

	None		Not known	
	Count	Percentage	Count	Percentage
Primary	111	35.58%	201	64.42%
Secondary	92	42.40%	125	57.60%
SEN/PRU	7	25.93%	20	74.07%

Few schools operate schemes that offer assistance to pupils in accessing ICT, although a higher number of schools loan equipment to staff.

Figure 5 Equity of ICT access



	Pupils							Staff						
	Subsidies	Loan	Leased	Financial loan	Refurbished	Other	None	Subsidies	Loan	Leased	Financial loan	Refurbished	Other	None
Primary	0.32%	4.17%	0.96%	0.32%	4.49%	0.00%	61.54%	3.85%	25.96%	3.53%	1.28%	7.37%	0.00%	51.60%
Secondary	2.76%	18.89%	3.23%	1.38%	6.91%	0.00%	50.69%	5.07%	30.88%	3.69%	0.92%	7.83%	0.00%	45.16%
SEN/PRU	0.00%	7.41%	0.00%	0.00%	3.70%	0.00%	62.96%	0.00%	44.44%	0.00%	0.00%	7.41%	0.00%	37.04%

The findings

Connectivity

This section deals primarily with schools' internet connections, and also looks at use of the internet, email and associated services. The areas covered in this section will help identify how schools are positioned in relation to the national digital infrastructure. Areas covered include specification, provision and management of internet-related services, as well as how schools use some of the services such as access to email.

	LA	Private ISP	RBC	Shared connection	Other
Primary	143	71	93	4	1
Secondary	107	27	80	1	2
SEN/PRU	14	9	4	0	0

We asked schools about their principal contract for internet access, excluding any separate connections for solely administrative or non-curriculum purposes. Table 3 shows the actual numbers of schools, and figures 6–8 express these figures as a percentage.

Figure 6 Principal internet service provider – Primary

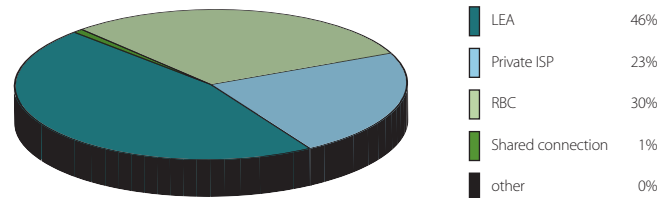


Figure 7 Principal internet service provider – Secondary

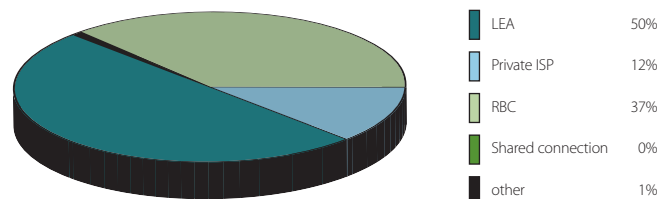
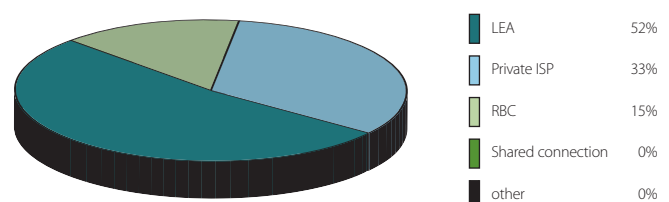


Figure 8 Principal internet service provider – SEN/PRU



For the types of connectivity used in schools, see table 4. As one would expect, there is a large rise in the use of ADSL and DSL connections since the previous survey in 2003.

Table 4 Description of internet connection to the school

	ADSL	DSL	ISDN	PSTN	Leased line	Satellite	Wireless	LAN extension service (LES)	Other	Not known
Primary	122	30	48	1	16	3	3	26	60	3
Secondary	59	25	4	0	34	2	8	17	65	3
SEN/PRU	12	4	5	1	2	0	0	1	2	0

The speed of connectivity in schools has also increased in line with the competitive market for broadband connectivity. In 2003, while a large number of schools had 2Mbps connections, the vast majority of schools had connections with speeds below 2Mbps. As figure 9 shows, most schools now have 2Mbps or faster.

Figure 10 illustrates annual internet connection costs (where schools have entered into an agreement that covers several years, we show this spread evenly over the contract term).

Any additional services included in the cost of schools' internet connection (as stated in figure 10) are shown in figure 11 overleaf.

Figure 9 Internet connection speeds

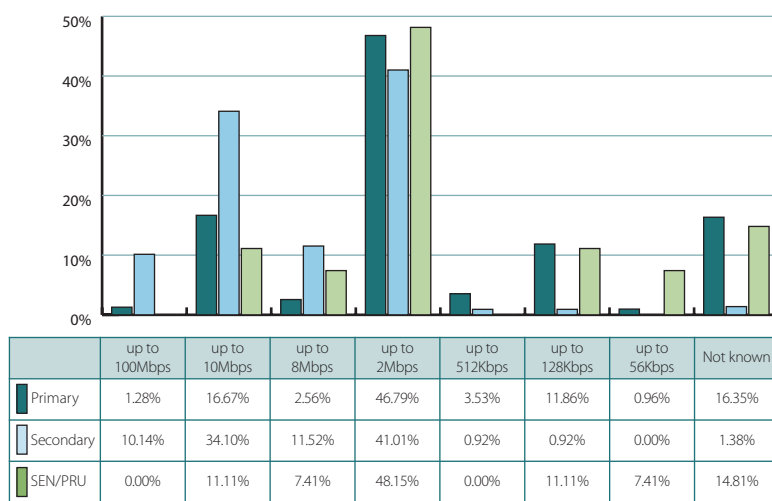


Figure 10 Annual cost of internet connection

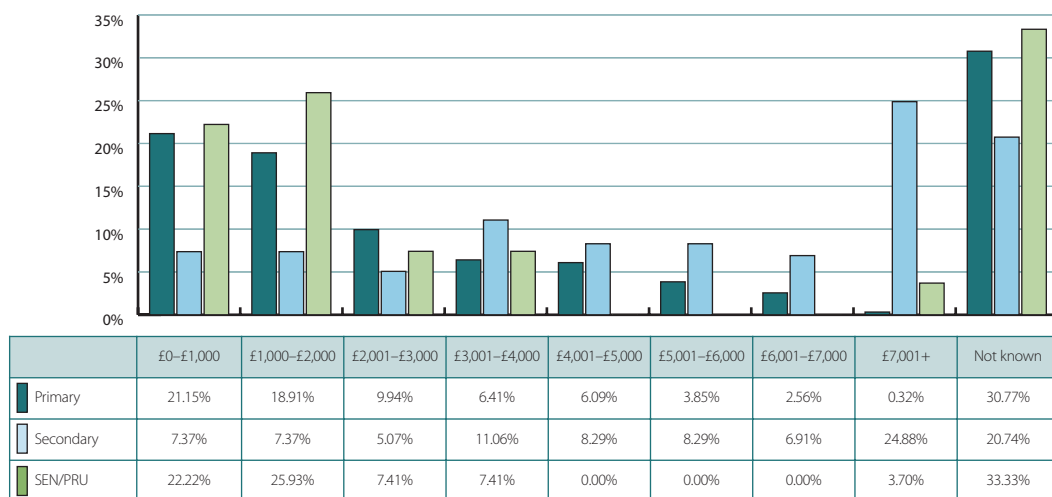
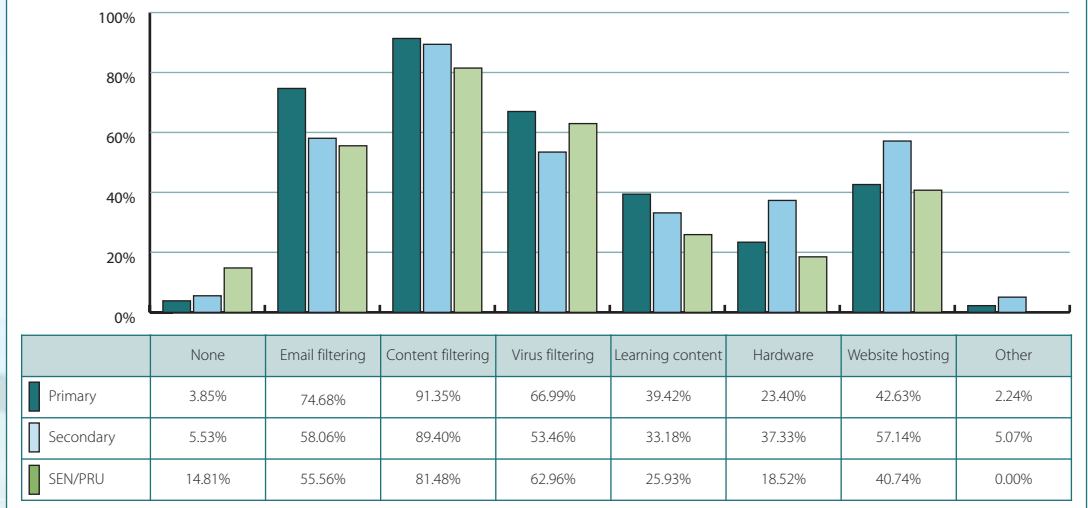




Figure 11 Typical additional services included in the cost of internet connection



Filtering services for the internet connection

This section covers internet browser filtering and we discuss email filtering below.

Figure 12 Internet connection filtering service provider

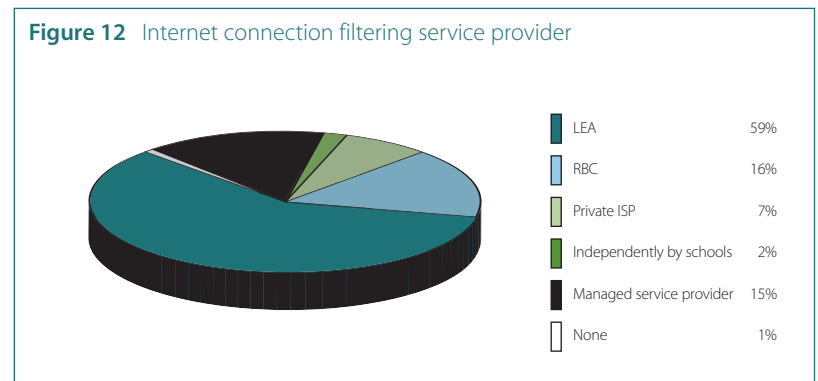


Table 5 Internet connection filtering service provider

	None	LA	RBC	Private ISP	Independently filtered by schools	Managed service provider
Primary	2	193	51	21	8	47
Secondary	0	121	52	14	69	25
SEN/PRU	0	17	2	2	2	6

Of all the schools surveyed, only two primary schools are using no filtering at all. The general trend is to use a service managed by the local authority, regional service or private managed service. As table 6 shows, primary schools tend to use a similar approach to managing the day-to-day blocking and unblocking of URLs.

Table 6 Management of day-to-day blocking/unblocking of URLs etc related to internet connection

	School	School reports to service provider	Service provider only (school has no control)
Primary	33	227	48
Secondary	129	79	9
SEN/PRU	9	12	5

Email filtering

Here again, many schools use a managed service. This is to be expected, given that most service providers offer packages that include both internet and email filtering.

Figure 13 Email filtering provision

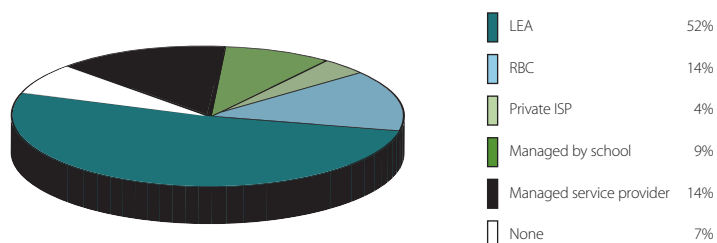


Table 7 Email filtering provision

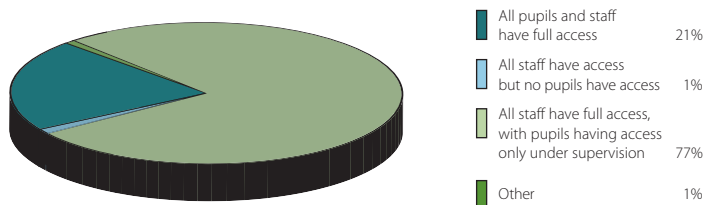
	Email filtering provision					
	None	LA	RBC	Private ISP	Managed by school	Managed service provider
Primary	15	189	46	10	7	54
Secondary	23	96	34	11	45	23
SEN/PRU	3	13	2	2	1	6

It appears that fewer schools have filtering on their email service than have web/browser filtering. This may be because some schools use browser-based email with web/browser filtering, so for these schools specific email filtering is not as high a priority.

The figures for who is responsible for day-to-day email filtering operations are almost identical to those for who manages web/browser blocking (see table 6).



Figure 14 Internet access in school



Access to the internet in school

It is encouraging to see that most schools of all types claim to provide full access with supervision.

Of the schools surveyed, 20% of primary, 73% of secondary and 41% of SEN/PRU use electronic methods to monitor pupil use of internet browsing. It is also interesting to note that 53% of secondary schools monitor staff use of the internet.

Table 8 Internet access in school

	All pupils and staff have full access		All staff have access but no pupils have access		All staff have full access, with pupils having access only under supervision		Other	
Primary	19	6.11%	2	0.64%	288	92.61%	2	0.64%
Secondary	88	40.93%	1	0.47%	122	56.74%	4	1.86%
SEN/PRU	7	25.93%	0	0%	20	74.07%	0	0%

Use of email in the school

Schools were asked a series of questions relating to how they allocate email addresses and how they access and use email.

Figure 15 Use of email by pupils

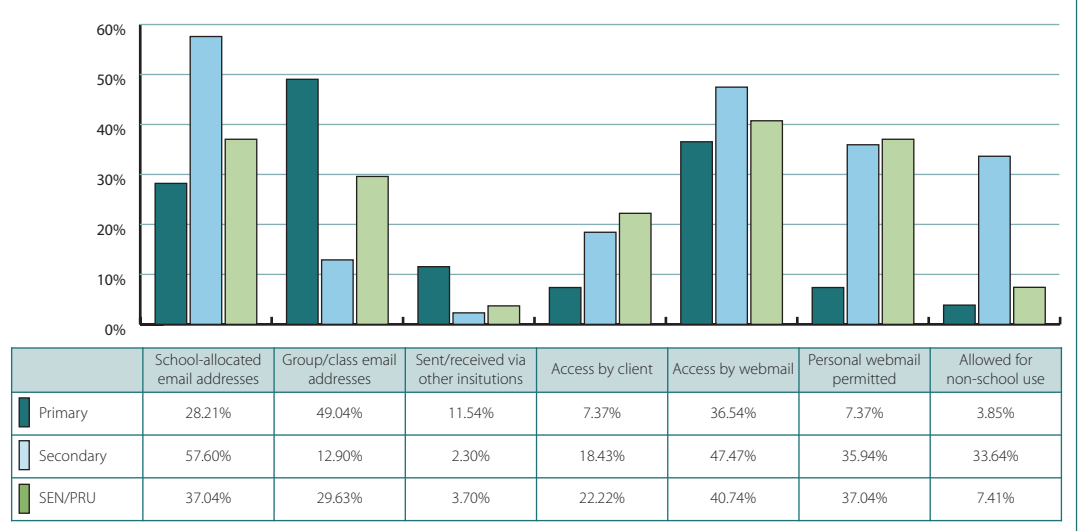
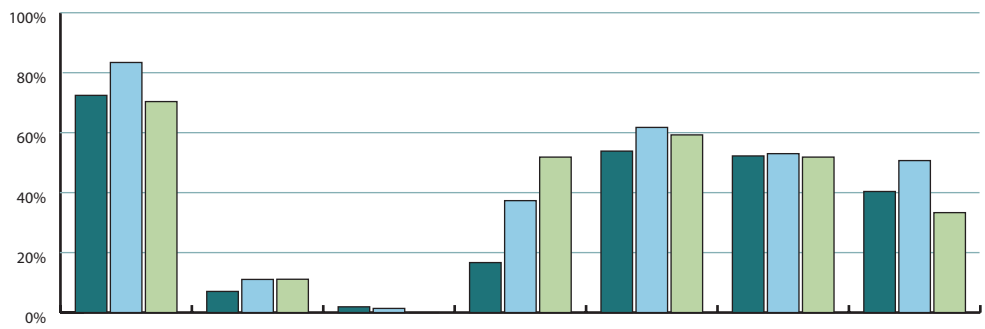


Figure 16 Use of email by curriculum staff



It appears that 2.3% of secondary and 7.5% of SEN/PRU schools do not use email at all. For primary schools, however, the figure was less than 1%. Asked about creating email addresses in such a way as to protect a pupil's name, age and gender, 13.5% of primary, 23% of secondary schools, and 30% of the SEN/PRUs, acknowledged that they did not do this.

Use of local mail server

Table 9 Schools using a local mail server

	Yes		No	
Primary	26	8.33%	286	91.67%
Secondary	88	40.55%	129	59.45%
SEN/PRU	5	18.52%	22	81.48%

Schools with local servers often manage the servers themselves (62% of secondary, 35% of primary and 40% of SEN/PRU), or use a managed service offered by the local authority or RBC (31% of primary and 40% of SEN/PRU, but only 4.5% of secondary).

The findings

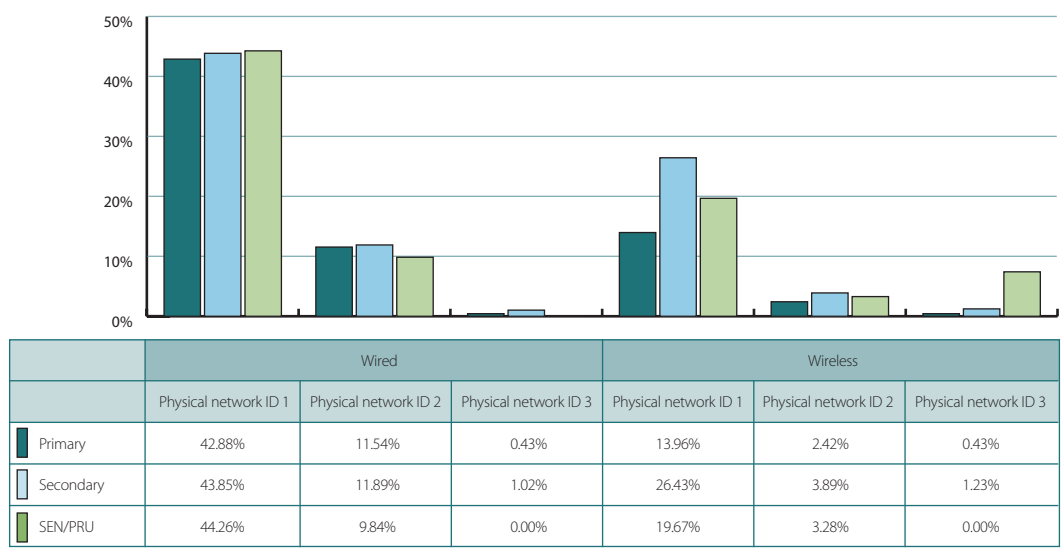
Infrastructure services

The aim of the school infrastructure should be to integrate systems and services which are fragmented in many of our institutions. This section of the report looks at current provisioning in some of the areas that contribute towards an integrated infrastructure. We have included areas such as the number, type and specification of equipment, as far as possible how it is configured, and how the equipment is maintained.

Only 3% of primary schools and 2% of secondary schools did not have a local area network, and all the SEN/PRU schools surveyed had a local area network.

The data here applies only to the three largest networks in each school, although many of the schools had more than three networks. We found that a larger proportion of secondary schools and SEN/PRUs than primary schools were using wireless networks.

Figure 17 Media type for each network



Some 41% of primary, 71% of secondary and 41% of SEN/PRU schools are using wireless networking in some format, including formal networks, as indicated in figure 17 above.

Wireless security

We checked school wireless network equipment to determine the security measures in place. At first glance it looks as though many schools have at least one measure in place, but closer inspection shows that many schools are not taking basic precautions with their wireless networking equipment. For example, many secondary schools are running on default settings (which are often very low security) and very few schools have disabled SSID broadcasting, have conducted a survey to limit access to the network from outside the building, or are using the latest recommended data-encryption standard, WPA.

Figure 18 Wireless data security measures

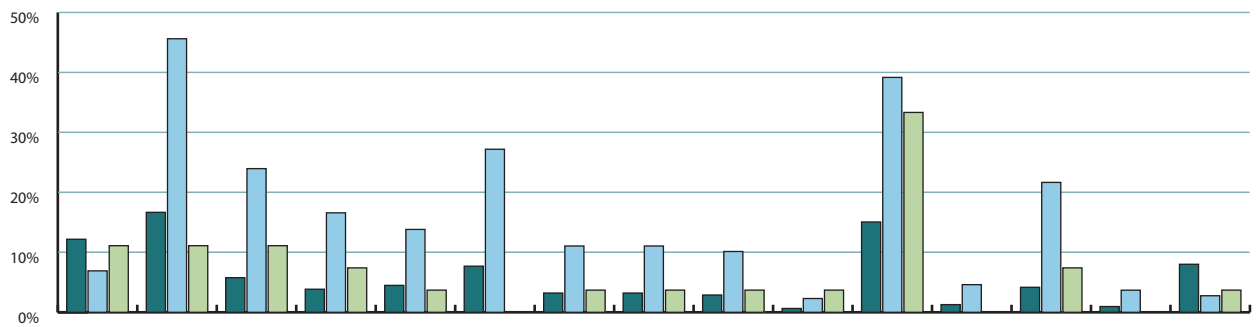
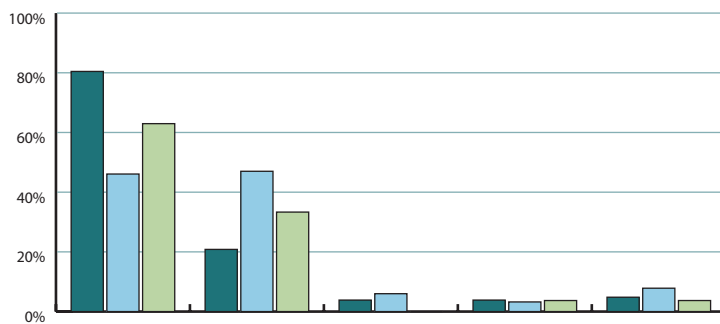


Figure 19 Topology infrastructure



Networks: client-server, peer-to-peer and thin client

With respect to the types of network operating on these topologies, most schools are now running the preferred client-server networks. However, we found that 21.5% of primary schools and 18.5% of SEN/PRUs were operating at least one peer-to-peer network, which is likely to be less efficient and less secure than a client-server network.

Interestingly, we also found 5.2% of primary schools and of 3.7% SEN/PRUs running thin-client network solutions, as were 9.2% of secondary schools. This has previously only been found to be a very small minority (1%-2%) of secondary schools, even less in primary and SEN, and could be due to schools trying to make longer use of older low-specification workstations.



Figure 20 Main backbone specification

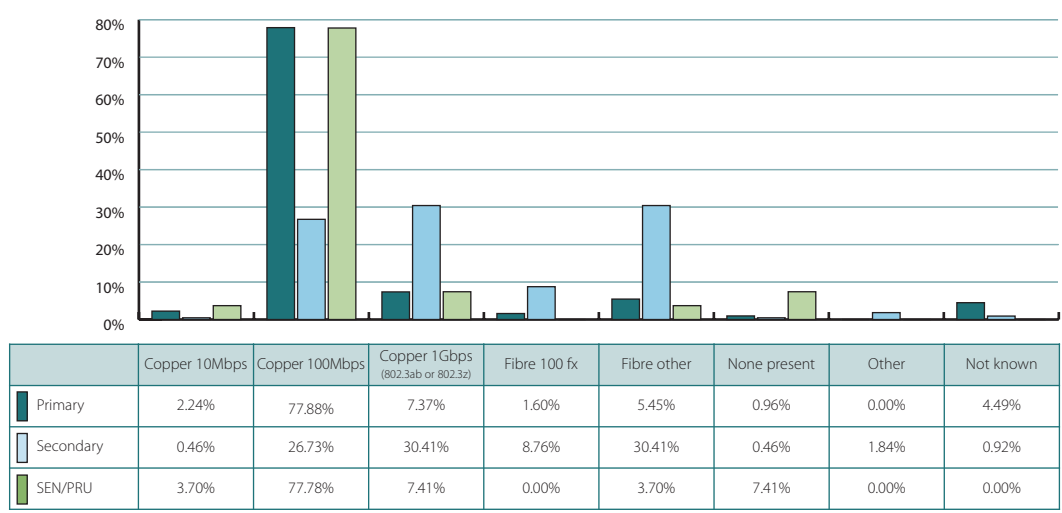
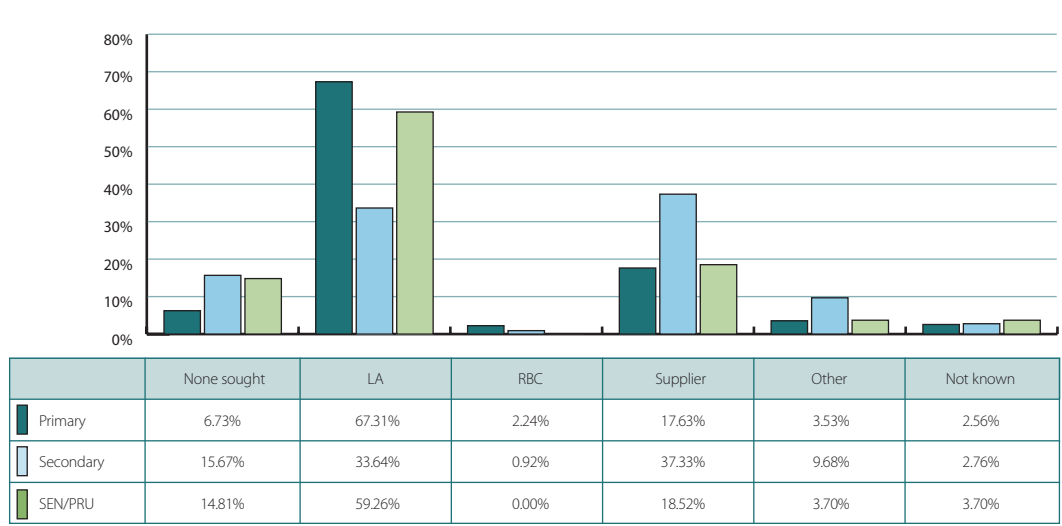


Figure 20 shows the specification of the main network cable (commonly called the 'backbone') between the main server(s) and the first point where large numbers of workstations are connected (usually via a switch).

Closer inspection revealed that 22% of primary, 9% of secondary and 37% of SEN/PRU schools had servers located on the network in a position that did not enable best use of the network backbone in place.

Schools were asked whether they sought advice when designing the school local infrastructure and, if so, where. A large proportion of primary schools and SEN/PRUs seek advice from their local authority, while secondary schools appear just as likely to take advice from a commercial supplier as from their local authority.

Figure 21 Advice sought when designing local infrastructure



The school network cable infrastructure data shows that large proportions of schools are now using entirely Category 5(e) standard cable; installed correctly, this will provide future proofing for data speeds of up to 1Gbps. However, it is clear that Category 6 cabling has not had the level of uptake that was expected when it was first introduced.

Table 10 Network cabling in the school

	All Cat 5e installed within last 5 years		Mostly Cat 6 installed within last 5 years		Mostly Cat 6 installed within last 5 years and small amount of Cat 5e or other		Mostly Cat 5 older than 5 years and small amount of new Cat 5e installed within last 5 years		Mostly Cat 5e installed within the last 5 years, plus a small amount of older Cat 5 or other		Other		Not known	
	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
Primary	198	63%	5	2%	5	2%	23	7%	77	25%	3	1%	1	0.3%
Secondary	109	51%	1	0.5%	16	7%	14	6%	70	33%	6	3%	1	0.5%
SEN/PRU	21	77%	0	0%	0	0%	5	19%	0	0%	0	0%	1	4%

Use of switches and hubs

While the use of switches is becoming more dominant, many schools are still using lower-specification hubs in addition to switches. It is not clear whether this is because older legacy equipment is still in place or whether schools are still buying hubs, but very few schools are using solely switch technology – 1 primary and 4 secondary.

Some 52% of primary, 70.5% of secondary and 67% of SEN/PRU schools have plans for a significant infrastructure upgrade in the near future.

Figure 22 Number of hubs

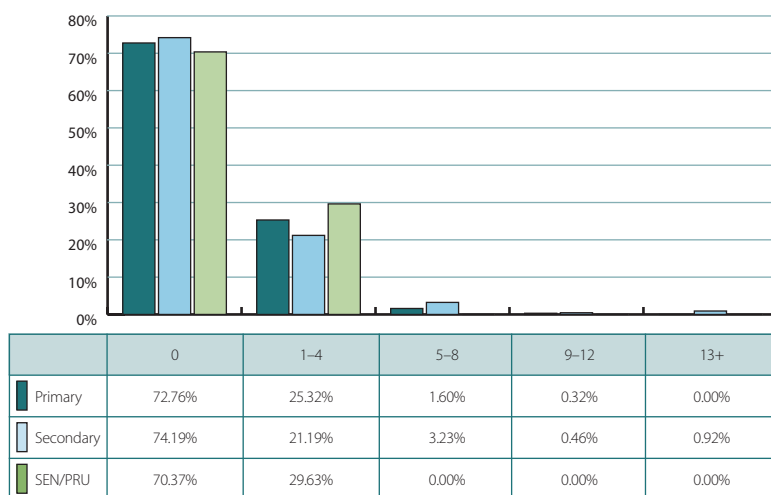
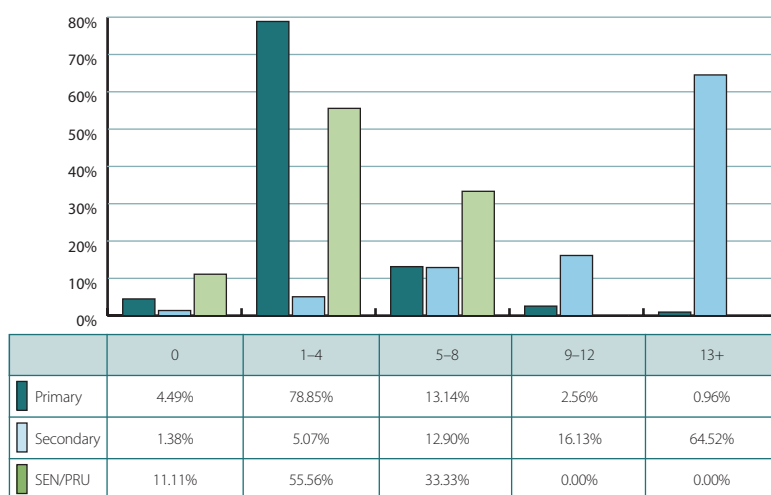


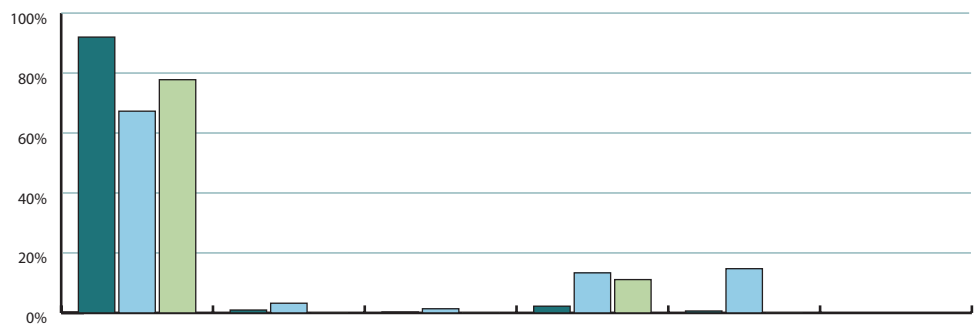
Figure 23 Number of switches





Access to the school network from remote locations (such as from home)

Figure 24 School network connection types



	None	PSTN dial-up	ISDN dial-up	Internet-based Virtual Private Network	Other	Not known
Primary	91.99%	0.96%	0.32%	2.24%	0.64%	3.85%
Secondary	67.28%	3.23%	1.38%	13.36%	14.75%	0.00%
SEN/PRU	77.78%	0.00%	0.00%	11.11%	3.70%	7.41%

Some 98% of primary, 76% of secondary and 95% of SEN/PRU schools have no self-help facilities or instructions available to support users in connecting to the network from off-site locations.

Servers

The amount of data relating to servers that we collected was complex to analyse, as many schools have more than one server, each of which may perform more than one task. Table 11 shows the primary role of servers as a percentage of the total number of servers in schools.

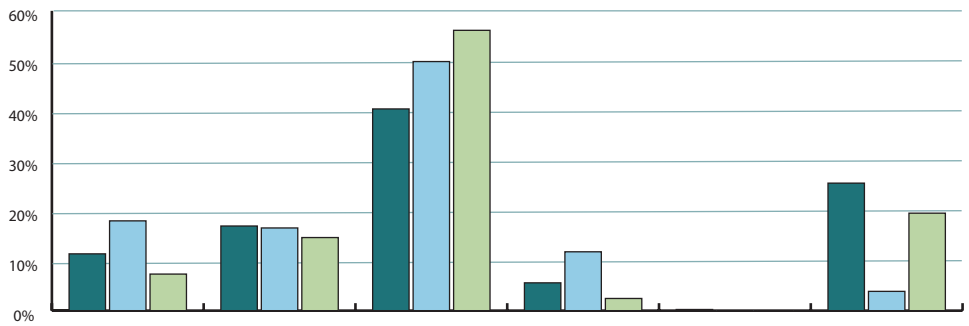
Table 11 Primary role of servers

	File	Print	Firewall	Proxy	Cache	Mail	Filtering	Applications	Thin client	Other
Primary	79.58%	59.63%	5.80%	7.66%	6.96%	8.58%	4.18%	51.51%	4.87%	3.48%
Secondary	56.75%	33.40%	3.45%	7.51%	3.96%	8.32%	3.86%	36.04%	3.45%	26.19%
SEN/PRU	75.61%	58.54%	4.88%	4.88%	2.44%	9.76%	0.00%	39.02%	0.00%	24.39%

From the server CPU manufacturer data we collected, it is clear that Intel processors dominate, with 77% of primary, 92% of secondary, and 73% of SEN/PRU servers running Intel-based CPUs. AMD is the closest competitor (3% of primary, 6% of secondary and 5% of SEN/PRU servers running AMD-based CPUs).

Figure 25 shows the typical speeds of school server CPUs.

Figure 25 CPU speed (GHz)



	0-1	1.1-2	2.1-3	3.1-4	4.1-5	Not known
Primary	11.37%	16.94%	40.37%	5.57%	0.23%	25.52%
Secondary	17.97%	16.55%	49.85%	11.78%	0.00%	3.86%
SEN/PRU	7.32%	14.63%	56.10%	2.44%	0.00%	19.51%

Operating systems on servers

As expected, Microsoft dominates the server operating systems in use, with 35.5% of primary, 53.2% of secondary and 41.5% of SEN/PRU servers using Microsoft Windows 2003, and 30% of primary, 33% of secondary and 27% of SEN/PRU servers using Microsoft Windows 2000.

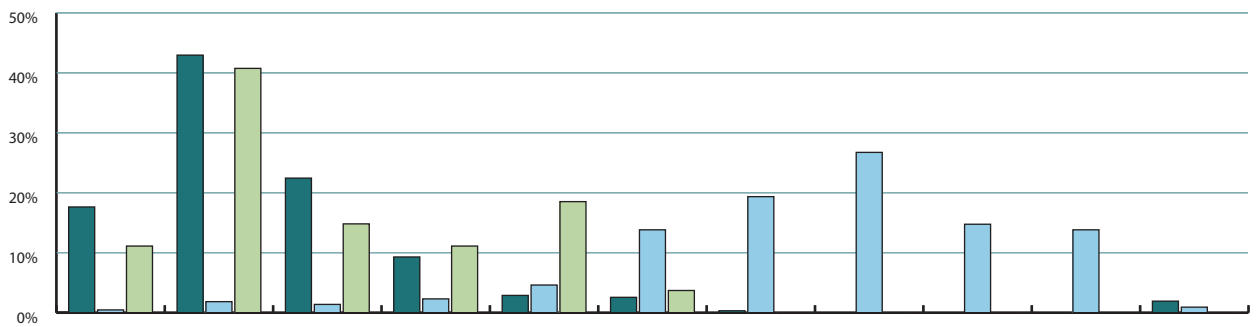
The levels of other operating systems in use are negligible – less than 1% – with the exception of Microsoft Windows NT4 and XP, which together account for around 7% of servers. We were unable to identify the operating systems for 18% of primary and 17% of SEN/PRU servers, either because the servers were not working at the time of the survey, or because they formed part of a secure managed-service system.



Workstations

The total count of all computers, including staff and administration computers and laptops but excluding computers that were not working at the time of our survey, is shown in figure 26 below.

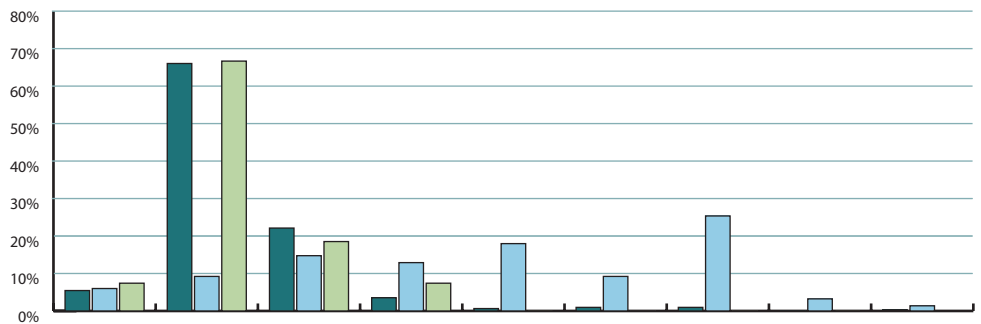
Figure 26 Computers in schools



	0-20	21-40	41-60	61-80	81-100	101-150	151-200	201-300	301-400	401+	Not known
Primary	17.63%	42.95%	22.44%	9.29%	2.88%	2.56%	0.32%	0.00%	0.00%	0.00%	1.92%
Secondary	0.46%	1.84%	1.38%	2.30%	4.61%	13.82%	19.35%	26.73%	14.75%	13.82%	0.92%
SEN/PRU	11.11%	40.74%	14.81%	11.11%	18.52%	3.70%	0.00%	0.00%	0.00%	0.00%	0.00%

Figure 27 below indicates how many of the school computers were funded by government or local authority schemes such as the Laptops for Teachers initiative.

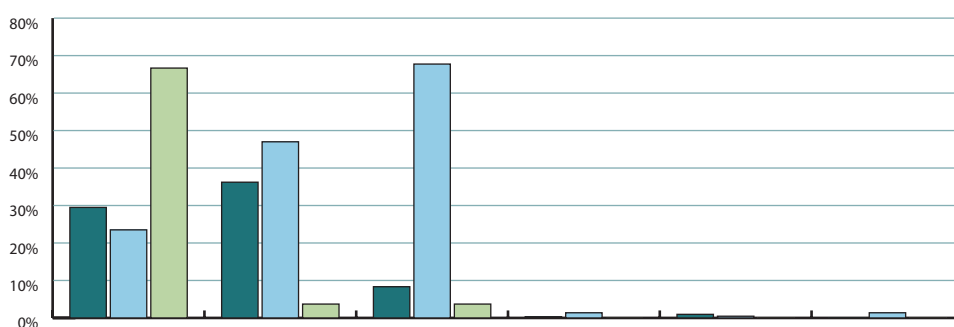
Figure 27 Number of government/LA-funded laptops



	0	1-10	11-20	21-30	31-40	41-50	51-100	101+	Not known
Primary	5.45%	66.03%	22.12%	3.53%	0.64%	0.96%	0.96%	0.00%	0.32%
Secondary	5.99%	9.22%	14.75%	12.90%	17.97%	9.22%	25.35%	3.23%	1.38%
SEN/PRU	7.41%	66.67%	18.52%	7.41%	0.00%	0.00%	0.00%	0.00%	0.00%

In order to gain an idea of how workstations were distributed around the school, we recorded the size of workstation groups and also whether the groups were wired or wireless. As figure 28 illustrates, groups of wireless workstations are still uncommon, and two thirds of secondary workstations are likely to be part of a suite of 25 or more.

Figure 28 Dedicated ICT suites

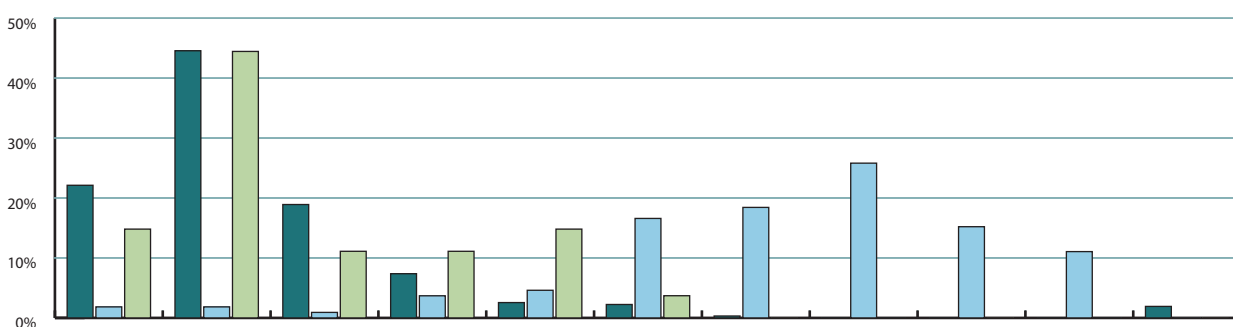


	Size of suite – wired			Size of suite – wireless		
	6–15	16–25	25+	6–15	16–25	25+
Primary	29.49%	36.22%	8.33%	0.32%	0.96%	0.00%
Secondary	23.50%	47.00%	67.74%	1.38%	0.46%	1.38%
SEN/PRU	66.67%	3.70%	3.70%	0.00%	0.00%	0.00%

Internet access

Most workstations in schools, as figure 29 shows, now have internet access.

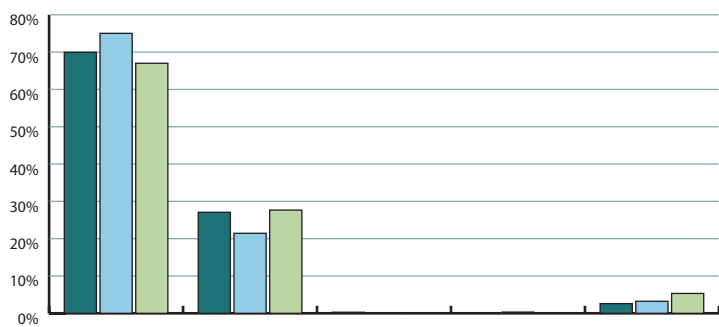
Figure 29 Computers with internet access



	0–20	21–40	41–60	61–80	81–100	101–150	151–200	201–300	301–400	401+	Not known
	Primary	22.12%	44.55%	18.91%	7.37%	2.56%	2.24%	0.32%	0.00%	0.00%	0.00%
Secondary	1.84%	1.84%	0.92%	3.69%	4.61%	16.59%	18.43%	25.81%	15.21%	11.06%	0.00%
SEN/PRU	14.81%	44.44%	11.11%	11.11%	14.81%	3.70%	0.00%	0.00%	0.00%	0.00%	0.00%



Figure 30 Workstation type



	Desktop	Laptop	Tablet with integrated keyboard	Tablet with no integrated keyboard	Not known
Primary	69.95%	27.07%	0.28%	0.09%	2.60%
Secondary	75.03%	21.44%	0.00%	0.32%	3.22%
SEN/PRU	67.02%	27.66%	0.00%	0.00%	5.32%

Types of workstation

Most of the computer workstations in use are either laptop or desktop. The number of tablet PCs is less than 1%; however, the 'not known' category may account for some of these, as where machines were off site, some survey respondents were not sure what type of portable those were.

When we recorded the type of workstation operating system in use, we were surprised to see that a large proportion of schools are on the latest available Microsoft operating system, Windows XP.

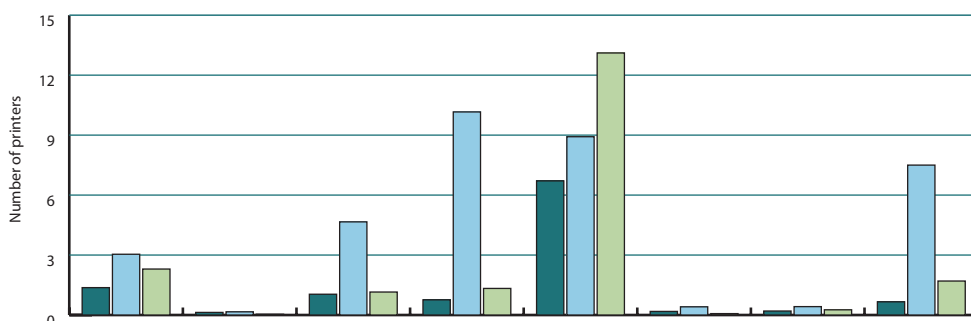
Types of printer

Figure 31 below shows the mean for each type of printer used in schools. We note the large number of inkjet printers in use, despite the fact that most inkjets have a higher total cost of ownership than laser printers.

Table 12 Workstation operating system

	Primary	Secondary	SEN/PRU
Windows 98	18.92%	2.6%	7.6%
Windows NT	0.61%	0.1%	0.0%
Windows ME	1.47%	0.0%	0.0%
Windows 2000	5.67%	14.0%	2.1%
Windows XP	72.02%	82.3%	82.3%
Mac OS	1.32%	0.9%	7.8%

Figure 31 Mean number of printers

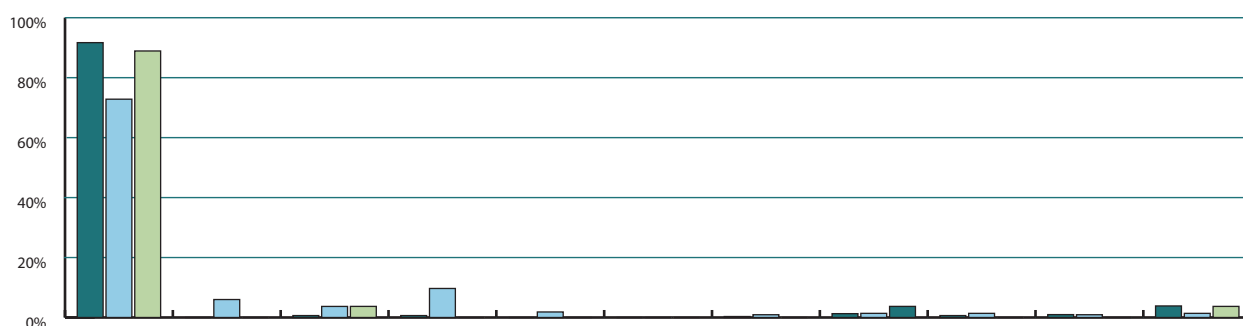


	Network				Standalone			
	Colour inkjet	Mono inkjet	Colour laser	Mono laser	Colour inkjet	Mono inkjet	Colour laser	Mono laser
Primary	1.37	0.13	1.04	0.76	6.71	0.18	0.20	0.66
Secondary	3.04	0.16	4.66	10.16	8.92	0.41	0.42	7.50
SEN/PRU	2.30	0.04	1.15	1.33	13.11	0.07	0.26	1.70

Video-conferencing facilities

We recorded whether schools had video-conferencing facilities in place and, if so, what type of system. In fact, very few schools have a system in place, which shows little change from the 2003–4 survey, despite the increased availability of broadband since this period.

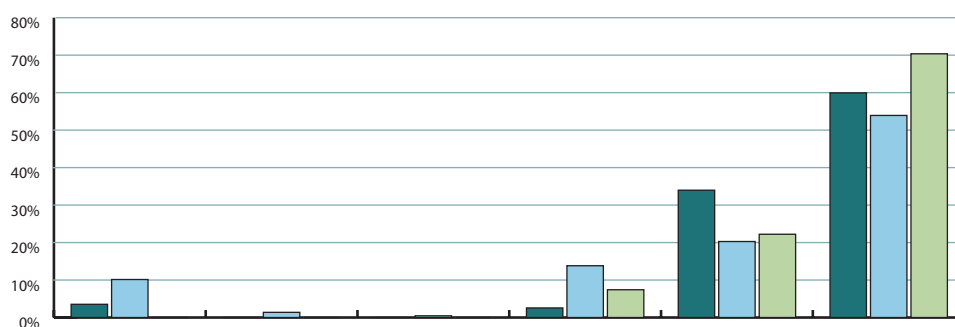
Figure 32 Video-conferencing facilities



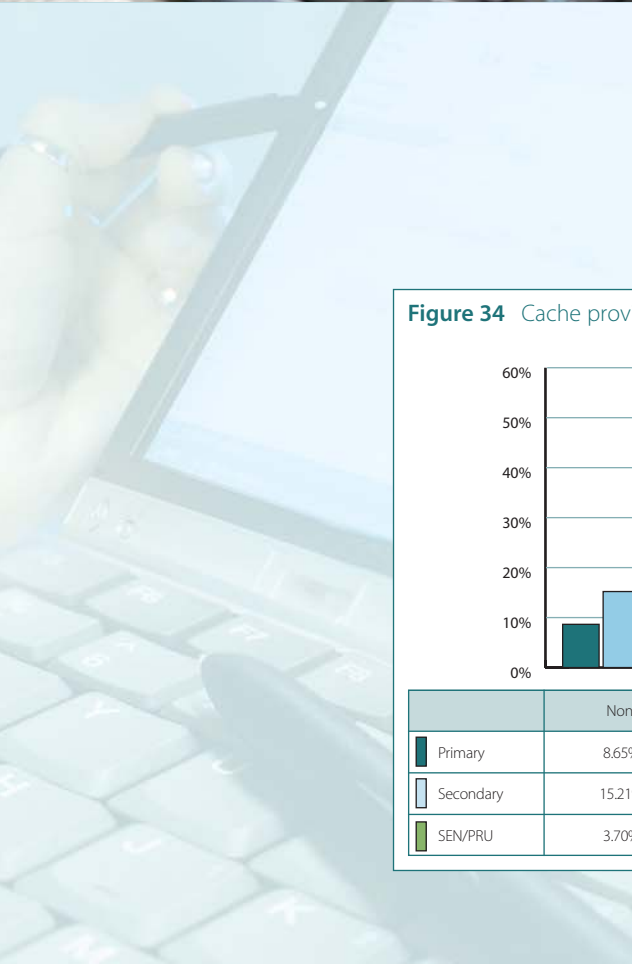
	None	Single camera – whole class			Single camera – person to person			Basic internet webcam			Not known
		LAN	ADSL	Other	LAN	ADSL	Other	LAN	ADSL	Other	
Primary	91.67%	0.00%	0.64%	0.64%	0.00%	0.00%	0.32%	1.28%	0.64%	0.96%	3.85%
Secondary	72.81%	5.99%	3.69%	9.68%	1.84%	0.00%	0.92%	1.38%	1.38%	0.92%	1.38%
SEN/PRU	88.89%	0.00%	3.70%	0.00%	0.00%	0.00%	0.00%	3.70%	0.00%	0.00%	3.70%

As figure 33 indicates, a significant number of schools have a video-conferencing facility in place yet did not use it. Where schools do not have a service in place at all, we have placed them in the 'Not applicable' category.

Figure 33 How often video-conferencing facilities are used



	1–5 hours per week	6–10 hours per week	More than 15 hours per week	Service in place but not used	Not known	Not applicable
Primary	3.53%	0.00%	0.00%	2.56%	33.97%	59.94%
Secondary	10.14%	1.38%	0.46%	13.82%	20.28%	53.92%
SEN/PRU	0.00%	0.00%	0.00%	7.41%	22.22%	70.37%



Content caching

We found that 50% of primary, 53.5% of secondary and 30% of SEN/PRU schools use a server for content caching. Of those that use one, about half said it was provided as part of a local or regional initiative.

Figure 34 Cache provided as part of a wider initiative

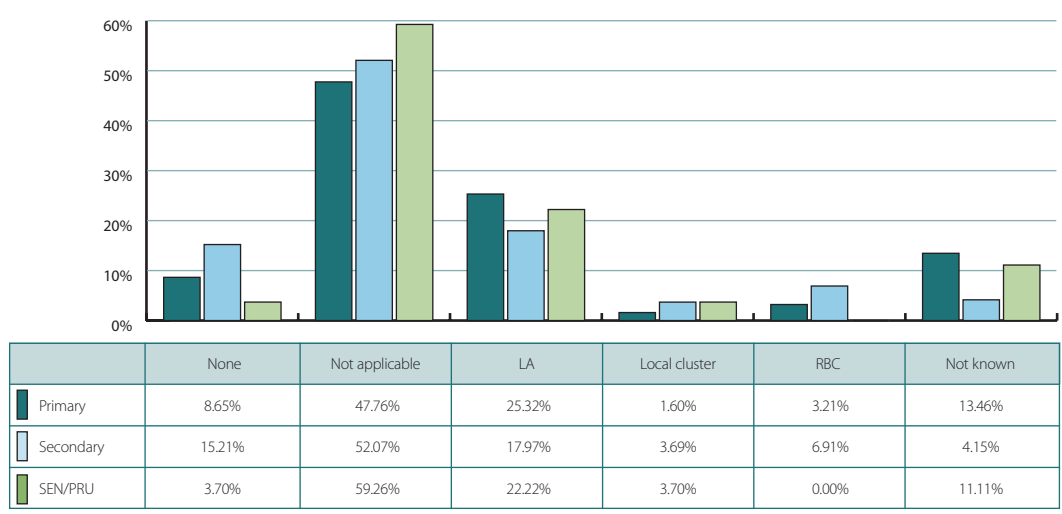


Table 13 lists the three most commonly used cached content titles.

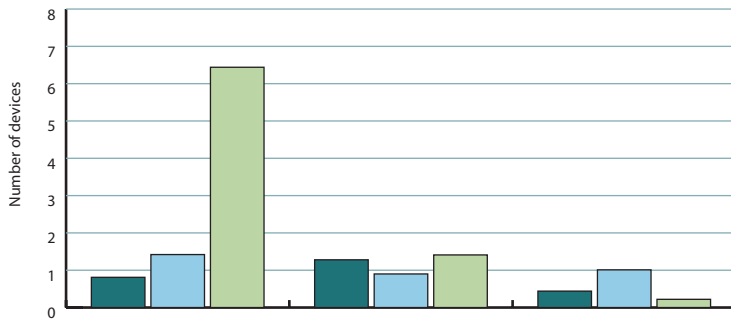
Table 13 Content widely used in schools

Primary			Secondary			SEN/PRU		
Espresso	41	13.14%	Sam Learning	26	11.98%	BBC.co.uk	1	3.70%
BBC.co.uk	32	10.26%	BBC.co.uk	18	8.29%	Content Stream	1	3.70%
Knowledge Box	20	6.41%	Bitesize	13	5.99%	Bitesize	1	3.70%
Education City	11	3.53%	Clip bank	7	3.23%	Education City	1	3.70%
Sam Learning	7	2.24%	Espresso	5	2.30%	Brain Pop	1	3.70%
Spark Island	3	0.96%	Linguascope	4	1.84%	Netlink	1	3.70%
Revise Wise	2	0.64%	Knowledge Box	2	0.92%	Teachnet	1	3.70%
Not known	40	12.82%	Not known	24	11.06%	Not known	1	3.70%

Special educational needs provision

During the visit, we counted the assistive technology devices used in the school to support pupils with special educational needs or disabilities. This included physical access devices such as tracker balls, switches, on-screen keyboards, and pointing devices; sensory access devices such as video magnifiers, text-to-speech software, Braille printers and hearing loops; and cognitive access devices, such as predictive word processors and voice-recognition systems.

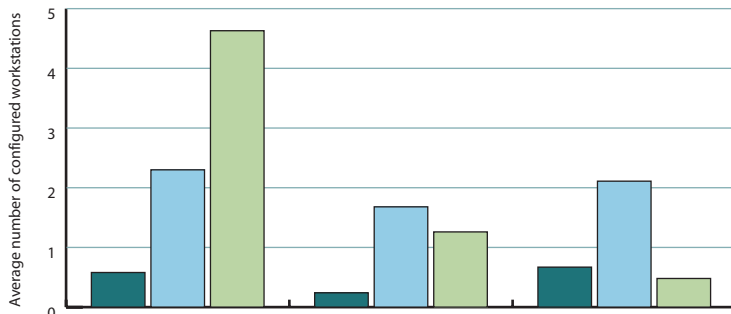
Figure 35 Average number of physical, sensory and cognitive-technology devices



	Physical	Sensory	Cognitive
Primary	0.81	1.28	0.44
Secondary	1.42	0.90	1.01
SEN/PRU	6.44	1.41	0.22

Figure 36 shows the number of workstations configured to meet the needs of individual users.

Figure 36 Special needs configuration



	Bespoke OS configurations	Dedicated peripherals	Located appropriately
Primary	0.58	0.24	0.67
Secondary	2.30	1.68	2.11
SEN/PRU	4.63	1.26	0.48

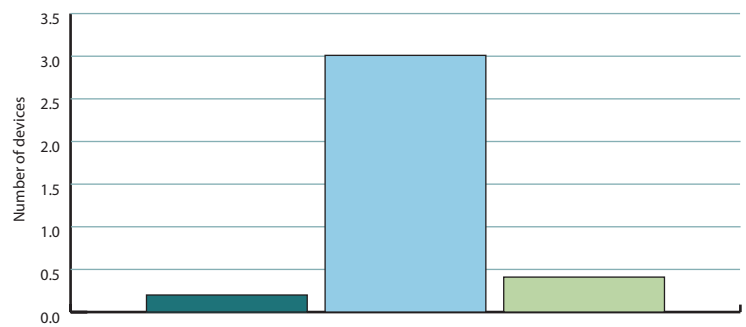


Personal digital assistants (PDAs)

We asked how many PDAs and smartphones the schools have (excluding any that are personally owned).

Only 2.5% of primary and 1% of secondary schools purchase them for pupil use, while 46.5% of primary, 14.5% of secondary and 64% of SEN/PRU schools purchased them for staff use. The use of the remainder was largely unknown. We also found that 87% of primary, 73% of secondary and 74% of SEN/PRU schools had no policy in place covering access to the school local area network by personally-owned PDAs or smartphones.

Figure 37 Average number of PDAs/smartphones

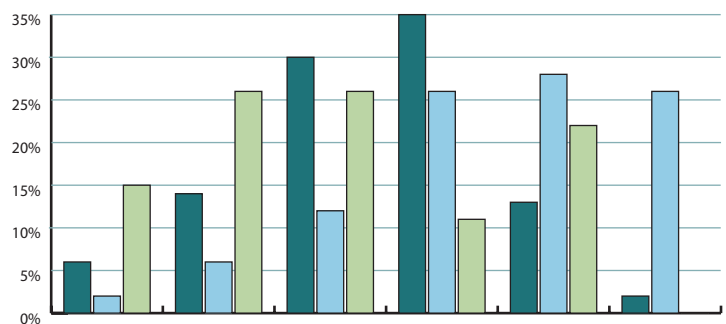


PDAs/smartphone devices – school funded	
Primary	0.20
Secondary	3.01
SEN/PRU	0.41

Interactive whiteboards

The mean number of interactive whiteboards is less than one in primary and SEN/PRU schools and just over two in secondary schools. Figure 38 shows in detail the spread of whiteboards.

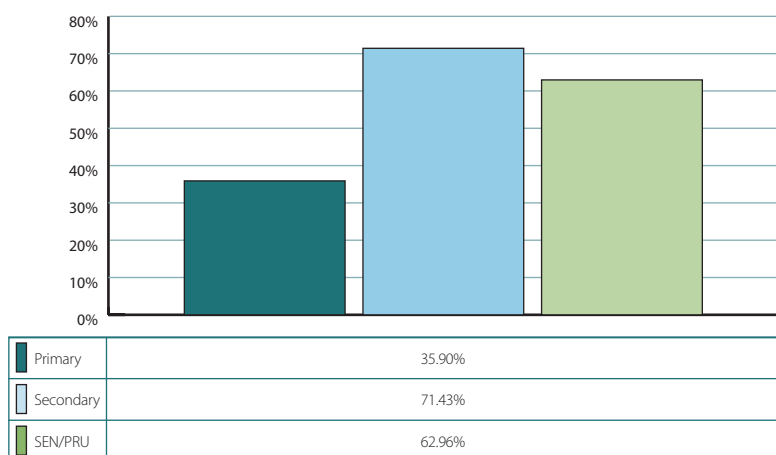
Figure 38 Number of interactive whiteboards per school



	None	1-2	3-5	6-10	11-20	21+
Primary	6%	14%	30%	35%	13%	2%
Secondary	2%	6%	12%	26%	28%	26%
SEN/PRU	15%	26%	26%	11%	22%	0%

The percentage of interactive whiteboards located in dedicated ICT suites is very high in secondary schools and SEN/PRUs, but lower in primary schools – probably because primaries are less likely to have a dedicated ICT suite.

Figure 39 Schools with interactive whiteboards located in ICT suites



In 82% of primary, 88% of secondary and 78% of SEN/PRU schools, all interactive whiteboards are connected to computers with internet access. In 7.7% of primary, 4% of secondary and 11% of SEN/PRU schools, no interactive whiteboards are connected to computers with internet access.

Some 61% of primary, 93% of secondary and 89% of SEN/PRU schools have at least one mobile projector, and 5% of primary and secondary schools are using wireless projectors.

Digital cameras and other devices

Figure 40 Average number of digital cameras

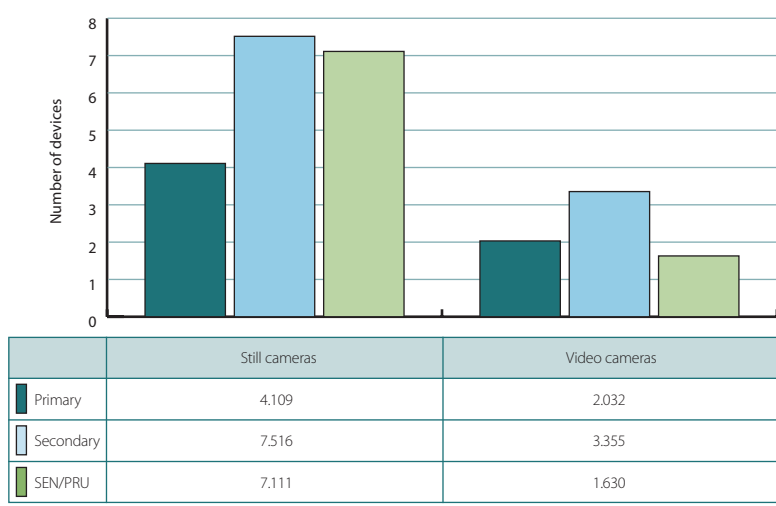
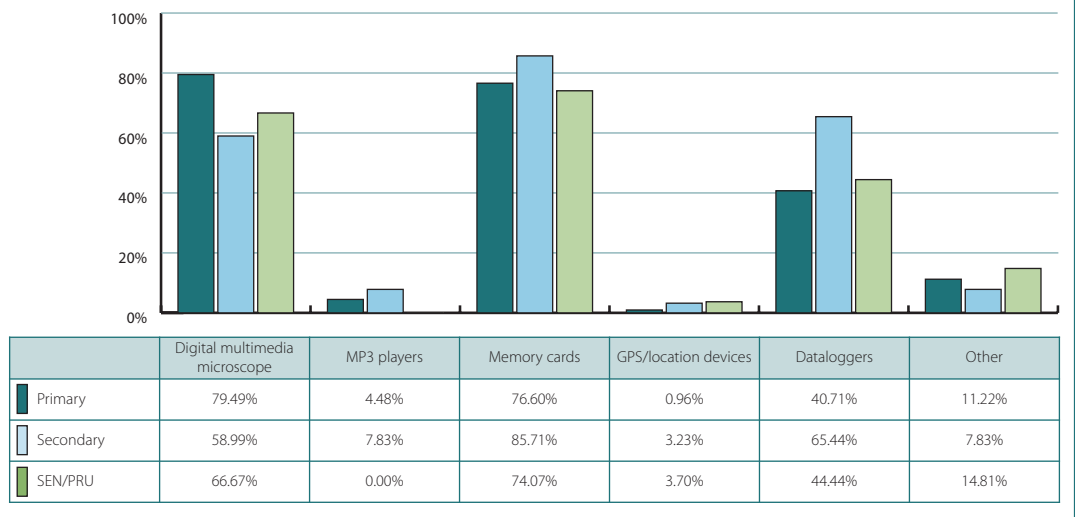




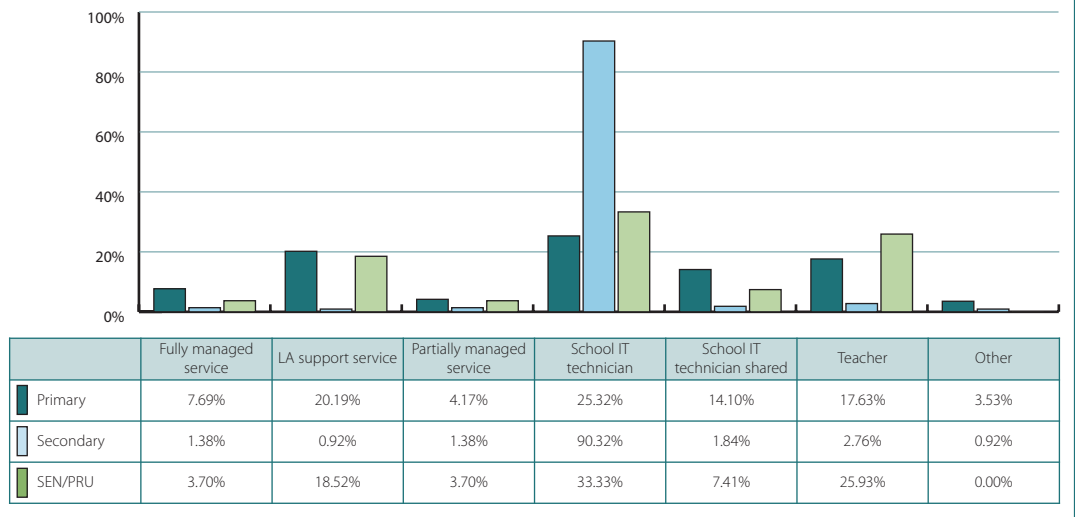
Figure 41 Other devices



Network administration, maintenance and support

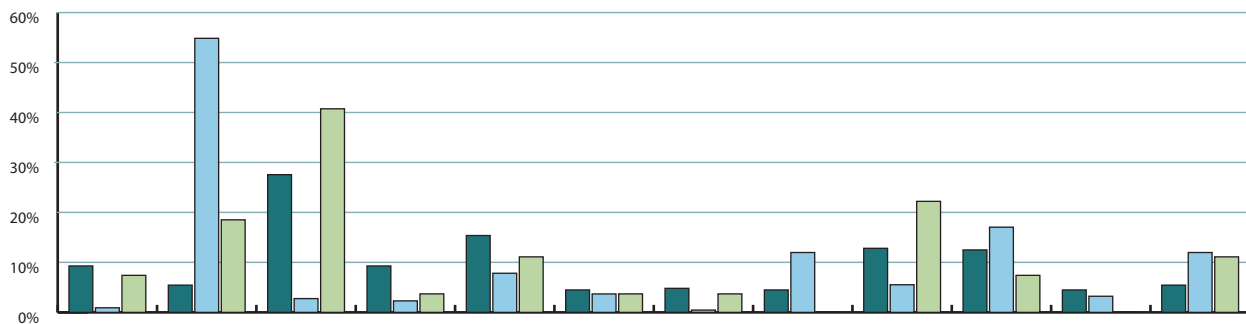
We asked who looked after specific day-to-day tasks on the school network.

Figure 42 Who normally deals with server failures



When we asked who looked after tasks such as setting up new users or solving login problems and printer failures, the results were almost identical to those responsible for dealing with server failure.

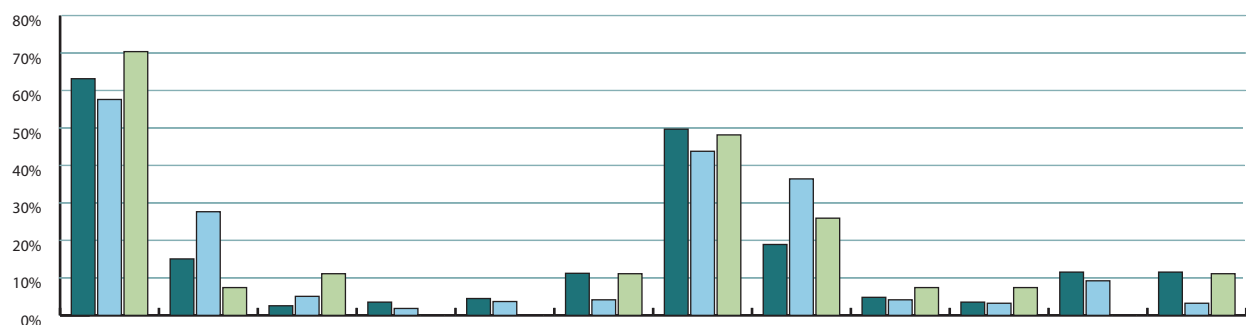
Figure 43 Ongoing service support



	All equipment						Unplanned downtime					
	Shared technician	Dedicated technician	LA-managed	Service partly LA-managed	Private managed	Partially private managed	Shared technician	Dedicated technician	LA-managed	Service partly LA-managed	Private managed	Partially private managed
Primary	9.29%	5.45%	27.56%	9.29%	15.38%	4.49%	4.81%	4.49%	12.82%	12.50%	4.49%	5.45%
Secondary	0.92%	54.84%	2.76%	2.30%	7.83%	3.69%	0.46%	11.98%	5.53%	17.05%	3.23%	11.98%
SEN/PRU	7.41%	18.52%	40.74%	3.70%	11.11%	3.70%	3.70%	0.00%	22.22%	7.41%	0.00%	11.11%

- In 90% of primary, 94% of secondary and 96% of SEN/PRU schools, there is a register to record all hardware and software in the schools.
- A high proportion of schools – 88% primary, 87% secondary and 81% SEN/PRU – carry out a regular audit of equipment.
- Some 36% of primary, 63% of secondary and 48% of SEN/PRU schools have a documented process in place for loaning out ICT equipment.
- In 38% of primary, 66% of secondary and 37% of SEN/PRU schools, there were spare workstations available to replace stolen/broken equipment at short notice.

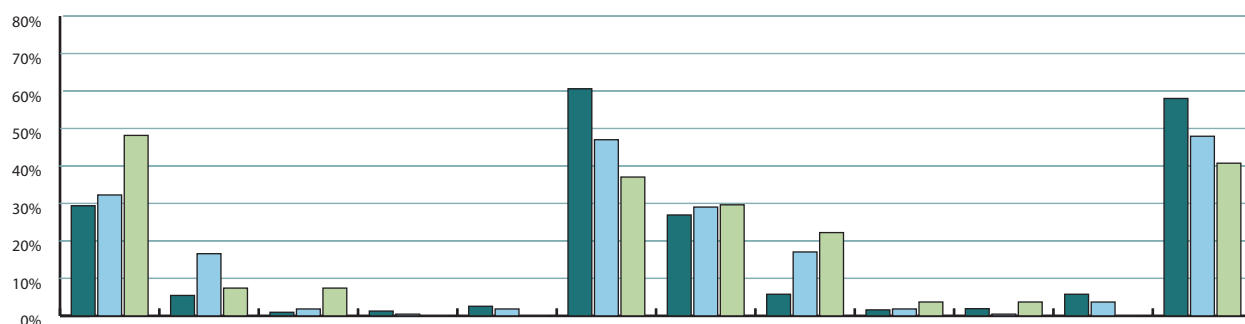
Figure 44 Downtime for network 1



	Planned downtime						Unplanned downtime					
	0	1–2	3–4	5–6	7+	Not known	0	1–2	3–4	5–6	7+	Not known
Primary	63.14%	15.06%	2.56%	3.53%	4.49%	11.22%	49.68%	18.91%	4.81%	3.53%	11.54%	11.54%
Secondary	57.60%	27.65%	5.07%	1.84%	3.69%	4.15%	43.78%	36.41%	4.15%	3.23%	9.22%	3.23%
SEN/PRU	70.37%	7.41%	11.11%	0.00%	0.00%	11.11%	48.15%	25.93%	7.41%	7.41%	0.00%	11.11%



Figure 45 Downtime for network 2



	Planned downtime						Unplanned downtime					
	0	1-2	3-4	5-6	7+	Not known	0	1-2	3-4	5-6	7+	Not known
Primary	29.17%	5.45%	0.96%	1.28%	2.56%	60.58%	26.92%	5.77%	1.60%	1.92%	5.77%	58.01%
Secondary	32.26%	16.59%	1.84%	0.46%	1.84%	47.00%	29.03%	17.05%	1.84%	0.46%	3.69%	47.93%
SEN/PRU	48.15%	7.41%	7.41%	0.00%	0.00%	37.04%	29.63%	22.22%	3.70%	3.70%	0.00%	40.74%

Network downtime

For the principal two networks in every school, we recorded the amount of planned and unplanned downtime (in whole days) during the last year. These figures are largely estimations, as many schools do not actually record this data.

We also noted whether schools made use of uninterruptible power supplies (UPS) to protect critical servers from electricity failure and power spikes.

Table 14 Use of UPS for critical servers

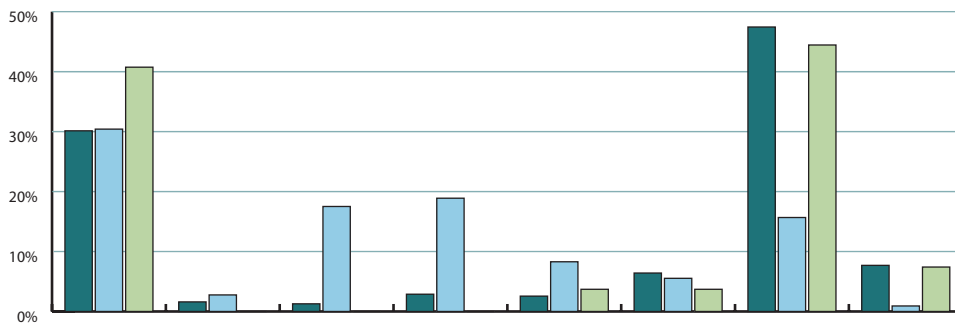
	No		Yes, but no controlled shutdown		Yes, with controlled shutdown		Not known	
Primary	111	35.58%	27	8.65%	158	50.60%	16	5.13%
Secondary	8	3.69%	28	12.90%	181	83.41%	0	0.00%
SEN/PRU	12	44.44%	4	14.81%	9	33.33%	2	7.41%

Data backup

As a percentage of all servers recorded in the survey, 69% of primary, 61% of secondary and 68% of SEN/PRU servers had backup devices available to them. However, only 38% of primary, 55% of secondary and 48% of SEN/PRU schools have a formal documented process. The remainder either have no process at all or do not document it. In 91% of primary, 95% of secondary and 81% of SEN/PRU schools, the person in charge of backing up has received appropriate training in the process. Some 19% of primary, 23% of secondary and 23% of SEN/PRU schools have a specific backup policy for users of laptops and mobile devices.

An important part of data backup is checking that the backup process is working, so we asked how often schools perform restores to test their ICT system. Some schools never test the system, and others only perform checks on an ad-hoc basis. It should be noted that this data applies to all the backup systems we found in schools: many schools have more than one backup system, and may test one and not the other(s).

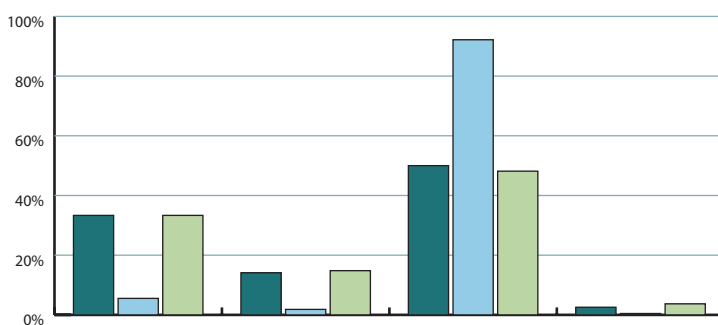
Figure 46 Frequency of restores



	Ad hoc	Daily	Weekly	Monthly	Half termly	Termly	Never	Not known
Primary	30.13%	1.60%	1.28%	2.88%	2.56%	6.41%	47.44%	7.69%
Secondary	30.41%	2.76%	17.51%	18.89%	8.29%	5.53%	15.67%	0.92%
SEN/PRU	40.74%	0.00%	0.00%	0.00%	3.70%	3.70%	44.44%	7.41%

In secondary schools the configuration, setup and management of the backup process are largely looked after in house, as is also the case in almost half of the primary and SEN/PRU schools. As figure 47 shows, a significant proportion (33%) of primary and SEN/PRU schools rely on a service provided by the local authority or RBC.

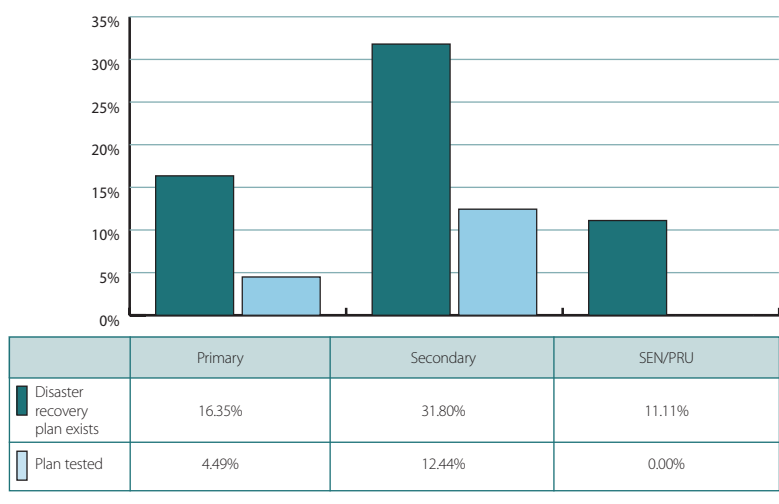
Figure 47 Configuration, setup and management of backup process



	LA/RBC service	Privately procured managed service	School managed	Not known
Primary	33.33%	14.10%	50.00%	2.56%
Secondary	5.53%	1.84%	92.17%	0.46%
SEN/PRU	33.33%	14.81%	48.15%	3.70%



Figure 48 Disaster recovery plans



As figure 48 illustrates, few schools have a documented disaster recovery plan in place, and of those that have one, even fewer have actually tested it.

Network security and virus protection

We asked about virus protection in the school (excluding home users and mobile users). Figure 49 gives an all-school summary, and table 15 a breakdown by school type.

Figure 49 Virus protection

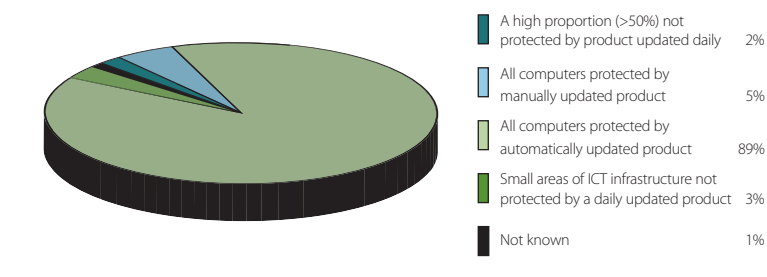


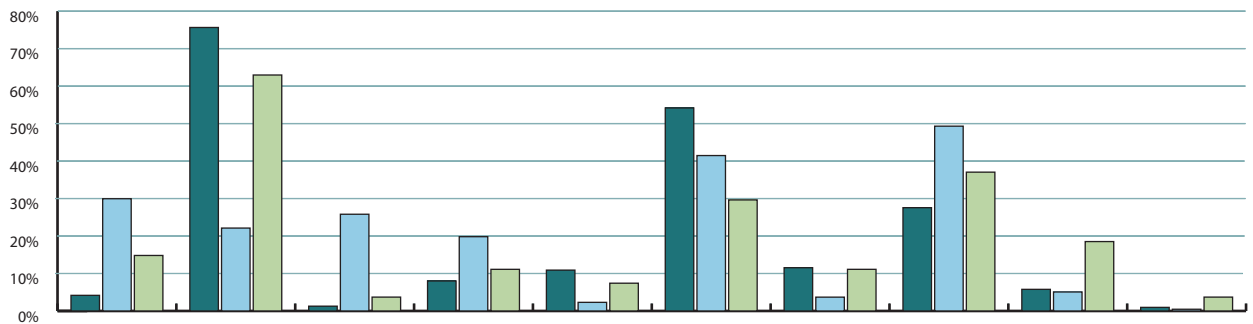
Table 15 Description of virus protection

	A high proportion (>50%) not protected by product updated daily	All computers protected by manually updated product	All computers protected by automatically updated product	Small areas of the ICT infrastructure not protected by a daily updated product	Not known
Primary	7	23	270	10	2
Secondary	2	5	205	4	1
SEN/PRU	3	2	19	2	1

Only a few schools make the school antivirus software available for pupil-owned equipment that connects to the network (5% primary and 12% secondary, but no SEN/PRU). More schools offer the same for staff-owned equipment (25% primary, 33% secondary and 15% SEN/PRU).

Figure 50 shows the proportion of schools having a security policy on the use of portable storage devices on the network, such as removable USB pen drives and MP3 players.

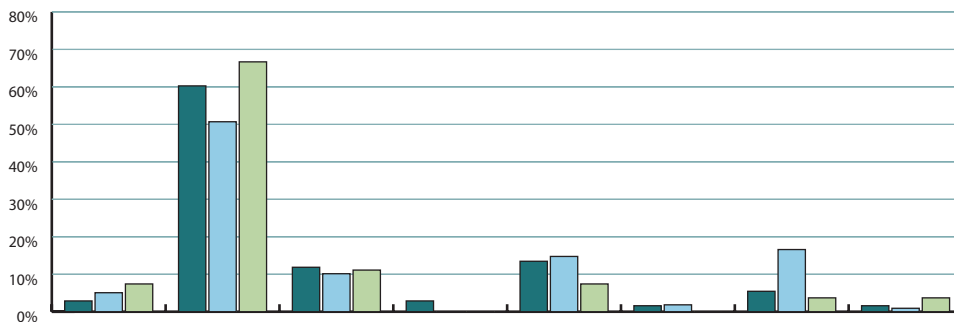
Figure 50 Portable device security policy



	Pupils					Staff				
	No, used informally	No, not used	Yes, used freely	Yes, with permission	Not known	No, used informally	No, not used	Yes, used freely	Yes, with permission	Not known
Primary	4.17%	75.64%	1.28%	8.01%	10.90%	54.17%	11.54%	27.56%	5.77%	0.96%
Secondary	29.95%	22.12%	25.81%	19.82%	2.30%	41.47%	3.69%	49.31%	5.07%	0.46%
SEN/PRU	14.81%	62.96%	3.70%	11.11%	7.41%	29.63%	11.11%	37.04%	18.52%	3.70%

School firewalls appear to be largely services provided by local authorities. It is probable, however, that some of these are actually provided by RBCs, as it is not uncommon for schools to regard RBC service provision as the same as local authority provision.

Figure 51 Firewall description



	ISP managed	LA managed	Managed by managed-service provider	No firewall	RBC connection firewall	School-managed firewall built into switch/router	School-managed software firewall	Not known
Primary	2.88%	60.26%	11.86%	2.88%	13.46%	1.60%	5.45%	1.60%
Secondary	5.07%	50.69%	10.14%	0.00%	14.75%	1.84%	16.59%	0.92%
SEN/PRU	7.41%	66.67%	11.11%	0.00%	7.41%	0.00%	3.70%	3.70%



Overall, 40% of schools have a documented password policy, and a further 40%–50% of schools have an undocumented policy for using passwords. This leaves between 10% and 20% of schools with no password policy at all. Figure 52 gives more detail and indicates the differences in policy for staff and pupils.

Figure 52 Password policy in place

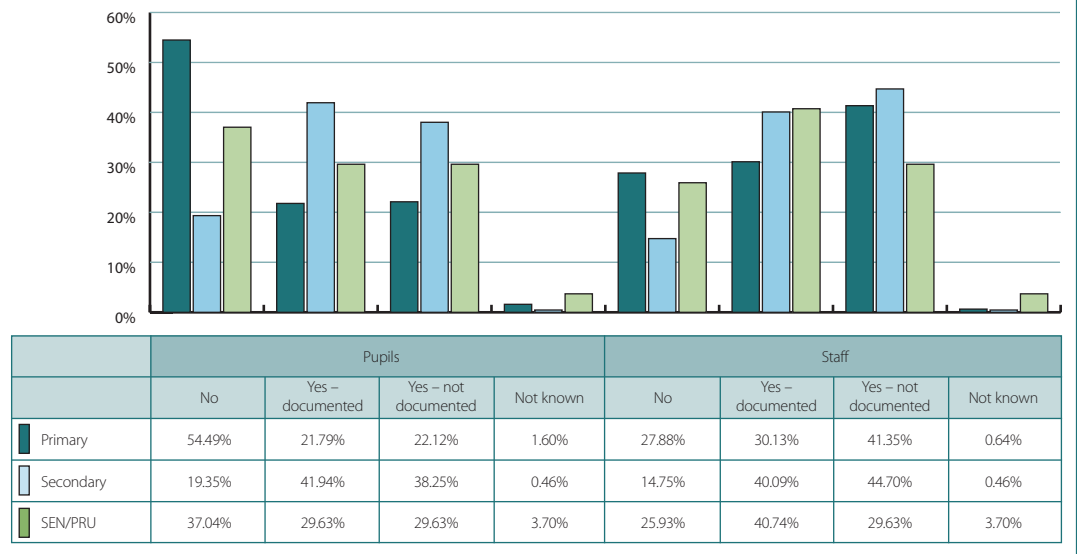
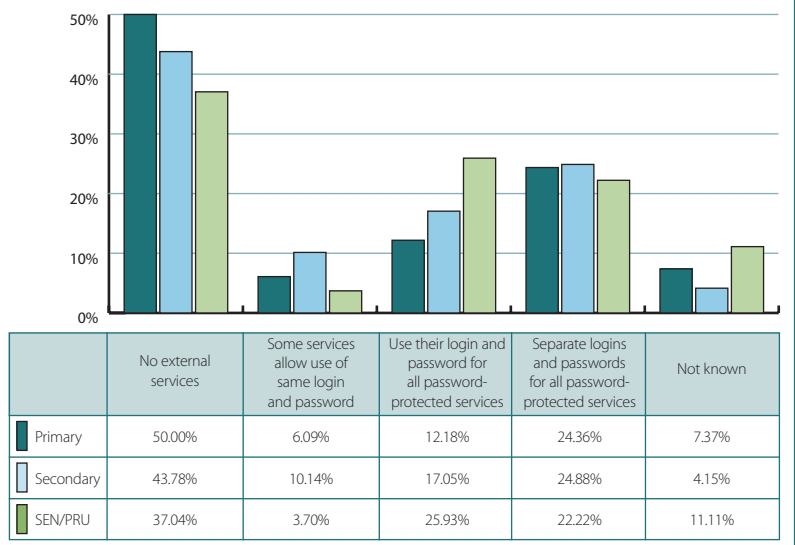


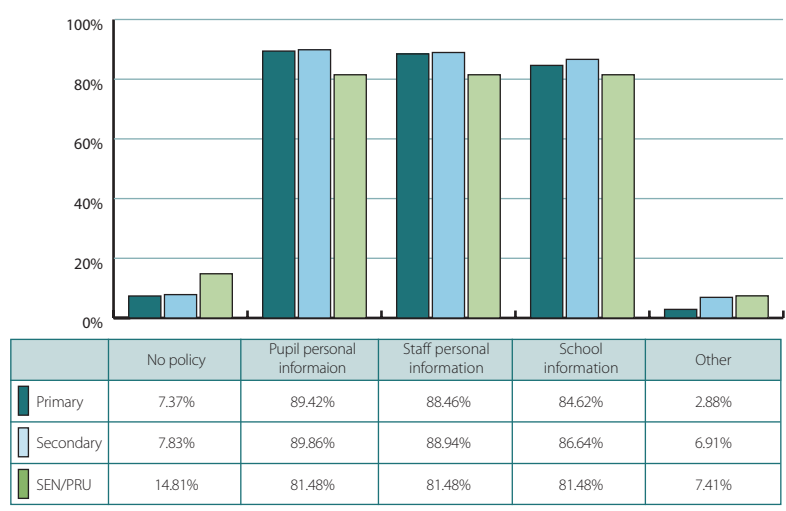
Figure 53 shows that, while 37%–50% of schools do not subscribe to any external services that require additional logons, a significant number of schools do have some or all of their external service logons synchronised so that users retain the same logo for them all.

Figure 53 Internal and external passwords synchronised



On the subject of data-protection policies, it is encouraging to see that most schools have now recognised the need for these, with only a small proportion of schools not having a policy in place. When we asked the same question in the 2003 survey, only about 60% of schools had a data-protection policy.

Figure 54 Documented data protection policy in place



Schools were asked whether they kept critical networking equipment in a secure manner and whether they kept the equipment – such as servers, switches and routers – in a locked cabinet or in a room with controlled access.

The increasing numbers of interactive whiteboards in schools have resulted in an increase in the theft of projectors, so we asked about the security measures schools take for projectors. The most common form of security is the etching or marking of projectors, with 69% of primary, 72% of secondary and 26% of SEN/PRU schools marking either all or some of their projectors. Security cages are also common, with 24% of primary, 38% of secondary, and 22% of SEN/PRU schools using these. A significant number of schools simply disassemble and lock them away (19% of primary, 31% of secondary and 37% of SEN/PRU).

Figure 55 Security of critical network equipment

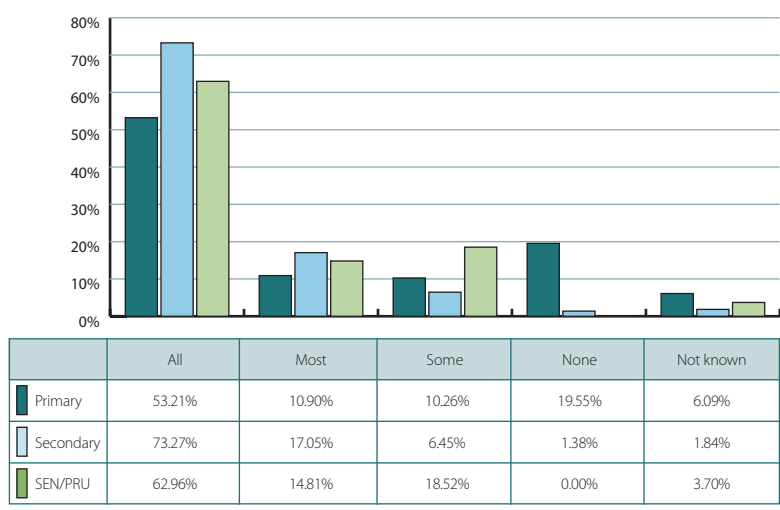
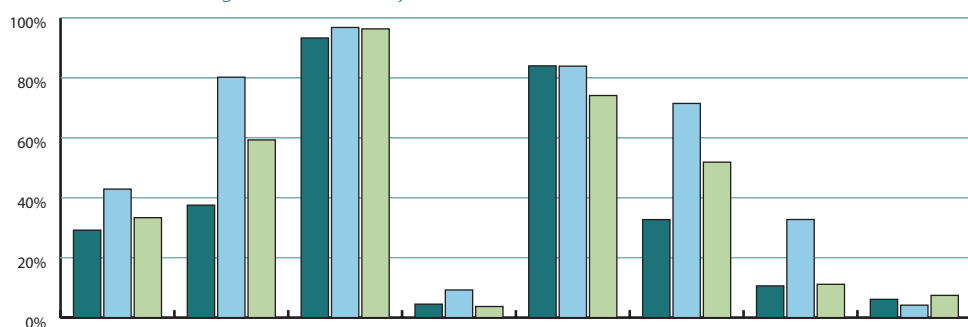




Figure 56 Measures taken for general ICT security



	Roller shutters/bars on windows	All doors locked when rooms not in use	Building alarms	Sonic alarms	Etching/marking	CCTV	Cable locks	Other
Primary	29.17%	37.50%	93.27%	4.49%	83.97%	32.69%	10.58%	6.09%
Secondary	42.86%	80.18%	96.77%	9.22%	83.87%	71.43%	32.72%	4.15%
SEN/PRU	33.33%	59.26%	96.30%	3.70%	74.07%	51.85%	11.11%	7.41%

As figure 56 illustrates, most schools have a range of general security measures in place to protect their ICT equipment.

In addition, 44% of primary, 47% of secondary and 27% of SEN/PRU schools have in place a policy to ensure that when they buy new ICT products they also buy adequate security products as a matter of course.

Network security breaches

Table 16 Number of security breaches/nuisances per week

	0	1	2	3-5	6-10	11-15	16-20	21+	Not known
Primary	98.08%	0.32%	0.32%	0.32%	0.00%	0.00%	0.00%	0.00%	0.96%
Secondary	84.79%	8.29%	0.92%	3.23%	0.92%	0.00%	0.00%	0.00%	1.84%
SEN/PRU	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Table 16 shows that overall levels of security breaches and nuisance are extremely low, and table 17 that the amount of time spent dealing with security-related issues (not including proactive maintenance) is more or less proportionate.

Table 17 Number of hours spent dealing with security issues per week

	0	1	2	3-5	6-10	11-15	16-20	21+	Not known
Primary	96.47%	2.88%	0.64%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Secondary	65.44%	16.13%	5.99%	10.14%	0.92%	0.92%	0.46%	0.00%	0.00%
SEN/PRU	81.48%	11.11%	3.70%	3.70%	0.00%	0.00%	0.00%	0.00%	0.00%

As table 18 shows, however, the time spent dealing with the results of ICT-related vandalism or theft appears to have a much higher impact on the working week of a school.

Table 18 Number of hours spent dealing with ICT-related vandalism or theft

	0	1	2	3-5	6-10	11-15	16-20	21+	Not known
Primary	91.35%	5.77%	1.28%	0.32%	0.64%	0.00%	0.00%	0.32%	0.32%
Secondary	37.79%	25.81%	16.59%	9.68%	6.91%	0.92%	0.46%	1.38%	0.46%
SEN/PRU	70.37%	25.93%	0.00%	3.70%	0.00%	0.00%	0.00%	0.00%	0.00%

The findings

Data services

This section reports on areas such as access to school management information systems (MIS) and their use, and the use of ICT for managing non-learning tasks such as access to buildings, cashless catering and library services. It is envisaged that by improving the management, reporting and analysis of data, schools will be able to make their information available in real time in the places where it can be of most value.

In all types of school, access to management information via staff or administration office workstations is still the preferred model.

We were interested to learn whether schools make use of ICT in other ways such as smartcards, proximity cards or biometric technology.

Access to buildings or rooms

Some primary schools are using proximity cards (7.5%) and smartcards (4.5%); some secondary schools use proximity cards (5.5%) and smartcards (5%); and 3.7% of SEN/PRUs use proximity cards and biometric technology.

Cashless catering

Secondary schools are the only ones to venture into cashless catering (13.8% are using smartcard technology, and 3.7% using a mixture of other products).

Photocopying and printing

In this area, secondary schools are again leading the way, with 4% using smartcard technology and 20% using some other (undefined) technology for controlling access to photocopying and printing facilities. Some 5% of primary schools and 7% of SEN/PRUs are also using unspecified technology for this.

Library

It is school libraries that make the most use of biometric technology – 7% primary, 15% secondary and 11% SEN/PRU.

Figure 57 Primary school access to management information

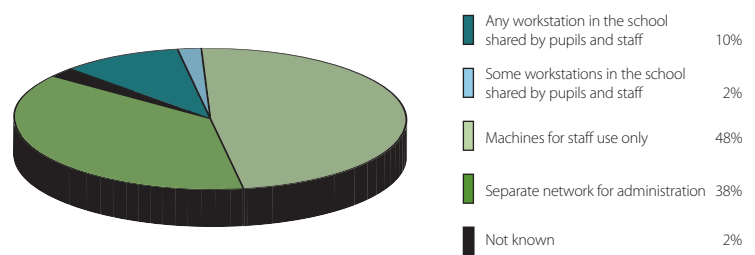


Figure 58 Secondary school access to management information

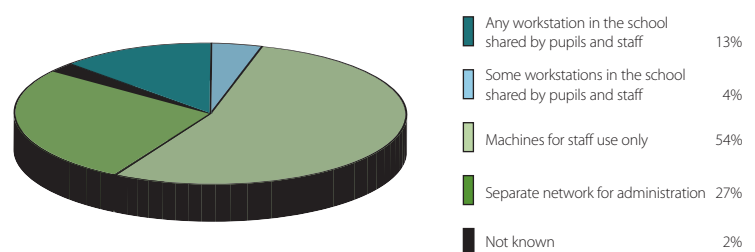
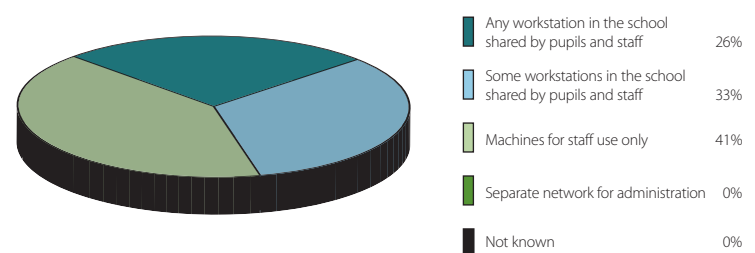


Figure 59 SEN/PRU school access to management information



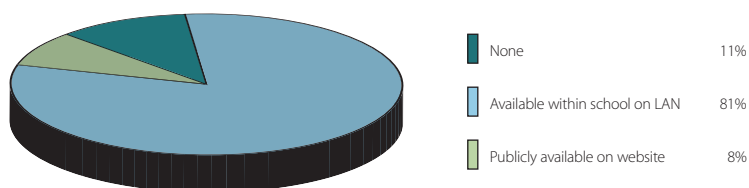
The findings

Learning services

Learning services are about more than simply managing the content used in learning environments: the term also encompasses learning platforms, the content they contain, the resources that rely on them and tools for communication and collaboration. This section considers the availability of such services – for example, e-portfolios, learning platforms and the use of online or onscreen tests – and their use.

When we asked about the availability of a repository or area for sharing learning objects and teaching resources – either public or internal – we found that few schools make resources publicly available. The most common way of sharing resources is within the school via the local area network. About 11% of schools have no shared repository at all.

Figure 60 Availability of shared resource repositories

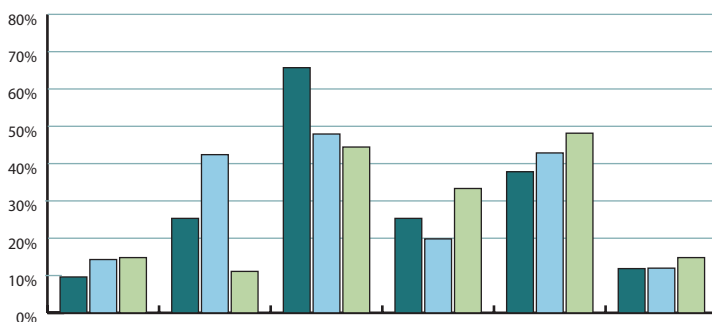


When asked where staff obtain their learning objects and teaching resources, schools demonstrated a more positive use of shared resources.

Online testing

As far as computer-based online test software is concerned, there is a clear predominance of the Key Stage 3 on-screen ICT test, which at the time of data collection involved about 37% of secondary schools. Following the announcement that the test is to become statutory in 2008, this proportion is now probably far higher.

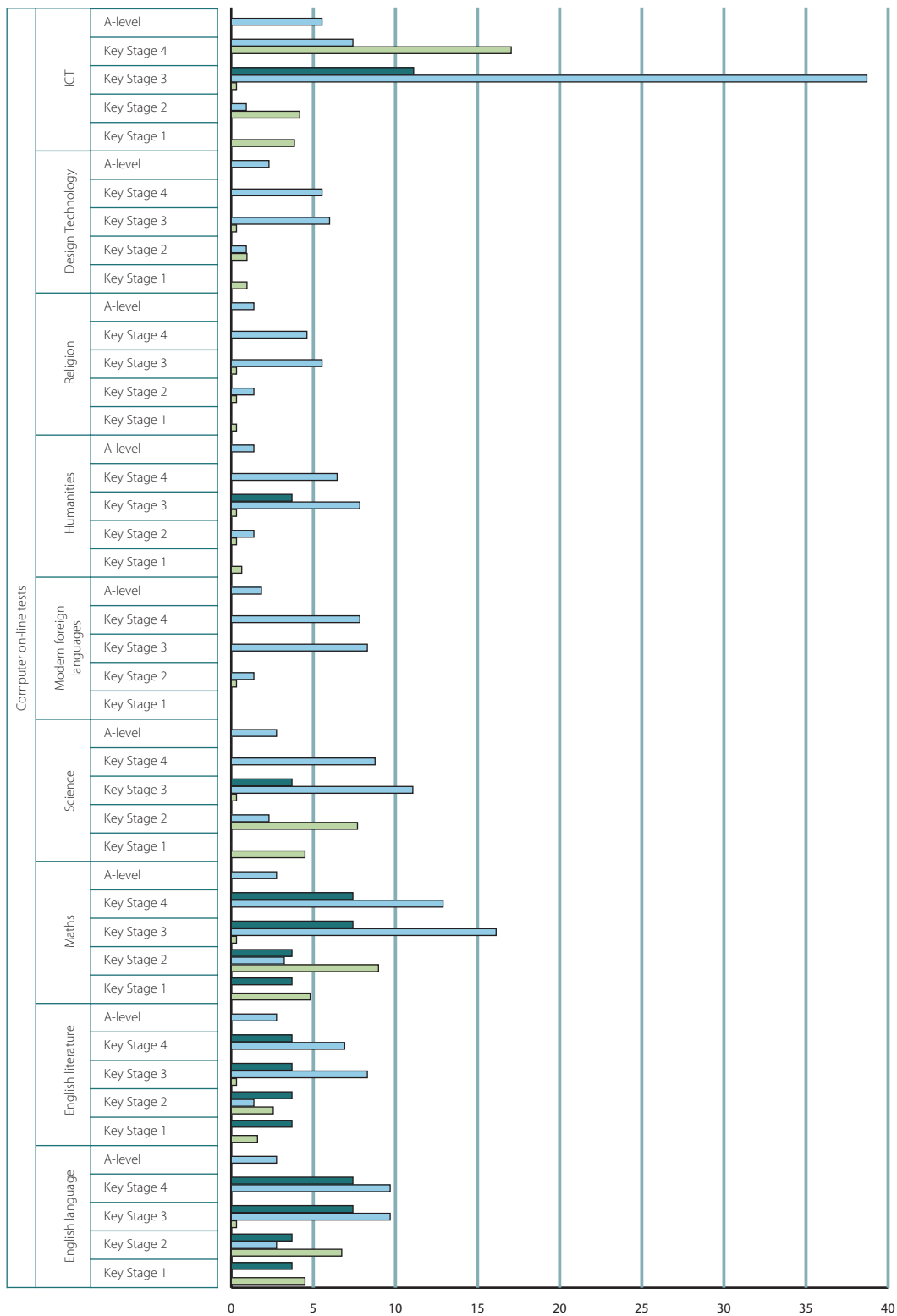
Figure 61 Origin of teaching resources/learning objects



Origin	No	School cluster repository	LA repository	Regional repository	Private provider	Other
Primary	9.62%	25.32%	65.71%	25.32%	37.82%	11.86%
Secondary	14.29%	42.40%	47.93%	19.82%	42.86%	11.98%
SEN/PRU	14.81%	11.11%	44.44%	33.33%	48.15%	14.81%

Figure 62 indicates clearly the large number of schools which are aware of the Key Stage 3 ICT test and have installed the required software. Figure 63 shows the results of our survey which asked schools using onscreen or online subject testing to indicate the numbers of pupils taking computer-based assessments during the 2003–4 school year. The Key Stage 3 ICT test does not feature as prominently as it does in Figure 62 because the survey was conducted prior to the national test taking place in May 2006. Most schools therefore did not have the opportunity to use the software by this time, except for the few schools that may have taken part in the May 2005 pilot.

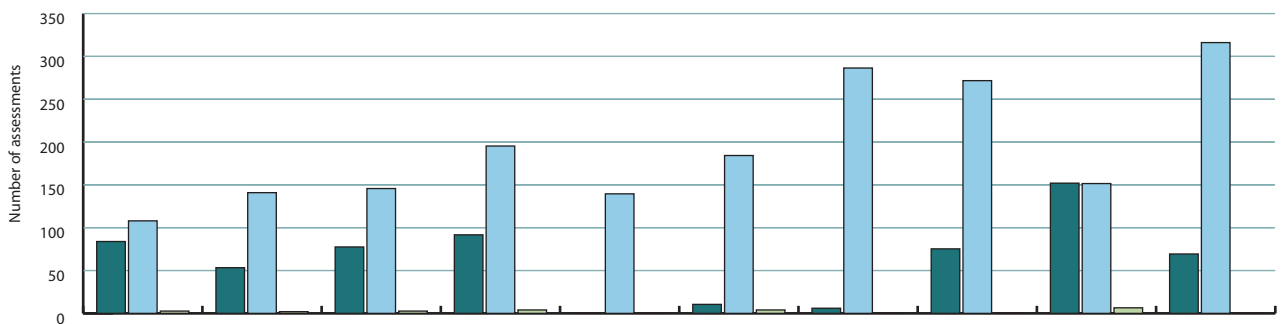
Figure 62 Online computer tests





In addition, we asked schools to estimate for each subject the numbers of pupils taking computer-based assessments during the last school year, and here the Key Stage 3 ICT test does not show so prominently. This is likely to be due to schools mainly being aware of the Key Stage 3 ICT test and the requirement to have the software, with the first national test taking place in May 2006 (after the data collection for this survey).

Figure 63 Average number of on-screen or online tests 2004–5



	English language	English literature	Maths	Science	Modern foreign languages	Humanities	Religion	Design technology	ICT	Other
Primary	83.88	53.33	77.52	91.71	0.00	10.50	6.00	75.33	152.00	69.33
Secondary	108.00	140.91	145.73	195.33	139.55	184.27	286.40	271.67	151.54	316.11
SEN/PRU	2.67	2.00	2.67	4.00	0.00	4.00	0.00	0.00	6.50	0.00

Learning platforms

Our survey covered the use of learning platforms, whether installed and accessed on the school network or remotely accessed (internet-based learning platforms, for instance). Interestingly, the responses for a large proportion of SEN/PRU schools fall into the 'not known' category, which may suggest a lack of familiarity with learning platforms. Many schools use both a remote and an on-site learning platform.

Table 19 Learning platforms in use

	Remotely accessed	On site	None	Not known
Primary	19.87%	19.23%	55.13%	14.42%
Secondary	36.87%	22.58%	44.70%	8.29%
SEN/PRU	14.81%	18.52%	7.41%	66.67%

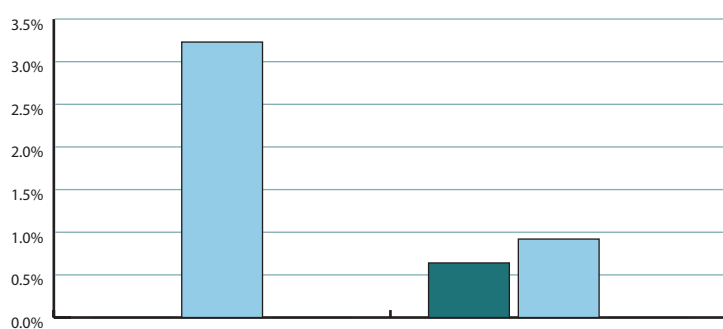
In secondary schools a small but significant proportion of learning platforms was linked to the school management information system. Very few primary schools and no SEN/PRUs reported having such links.

Access to learning services

E-portfolios

The provision of electronic portfolios in schools, considering their fairly recent introduction, is quite common.

Figure 64 Learning platform linked to MIS



	Remotely-accessed learning platform linked to MIS	On-site learning platform linked to MIS
Primary	0.00%	0.64%
Secondary	3.23%	0.92%
SEN/PRU	0.00%	0.00%

Table 20 Formal e-portfolio provided

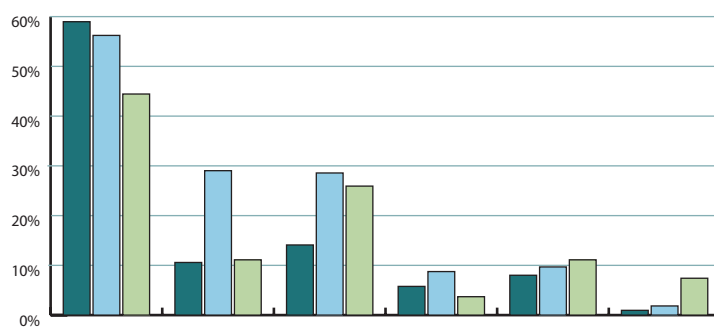
	Yes		No	
Primary	57	18.27%	255	81.73%
Secondary	54	24.88%	163	75.12%
SEN/PRU	4	14.81%	23	85.19%

Use of school websites and intranets

We asked schools about their websites, the levels of access to them and the facilities on offer through them. Around 71% of primary, 91% of secondary and 63% of SEN/PRU schools have a school website of some description.

Figure 65 shows the proportion of school websites that offer secure login areas for specific user groups.

Figure 65 Secure login areas on school website

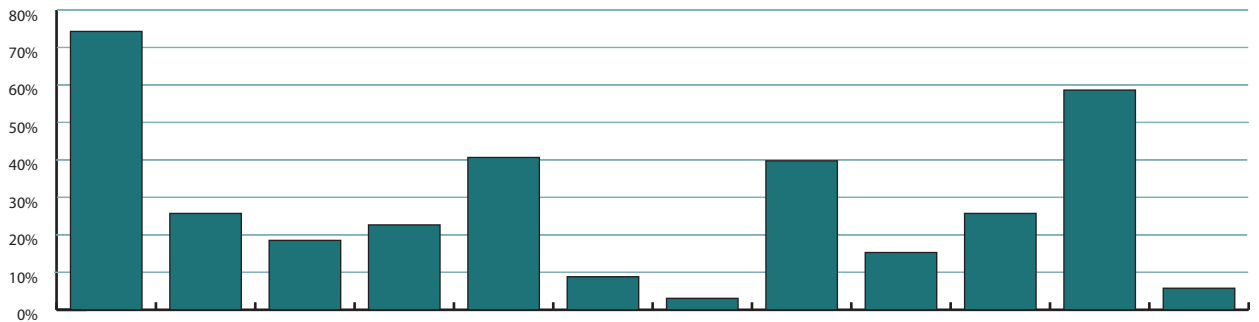


	None	Pupils	Staff	Parents	Governors	Other
Primary	58.97%	10.58%	14.10%	5.77%	8.01%	0.96%
Secondary	56.22%	29.03%	28.57%	8.76%	9.68%	1.84%
SEN/PRU	44.44%	11.11%	25.93%	3.70%	11.11%	7.41%



Figure 65 indicates what services the website provided (in addition to the kind of information normally found on most websites, such as contact details and so on).

Figure 66 Website usage



	School news	Pupil lesson resources	Teacher lesson resources	Email access	Document access	Intranet access	MIS access	Assessment/Ofsted data	Homework upload/download	Resources for parents	Parent communication	Other
Schools	74.26%	25.72%	18.53%	22.66%	40.65%	8.81%	3.06%	39.75%	15.29%	25.72%	58.63%	5.76%

In addition, 19% primary, 63% secondary and 30% SEN/PRU schools make use of school intranets.

Progress and challenges

Overall, the stock of equipment and infrastructure in schools seems to be improving. Computer-to-pupil ratios appear to have improved against the historical survey data on ICT use in schools and the Pupil Level Annual Schools Census (see figure 2.1 of the *Becta Review 2006*). Around half of all schools have no ICT refreshment policy, however, and purchasing trends indicate that they could make better use of procurement facilities offering benefits of economies of scale.

We found evidence of a good dominance of LA/RBC connectivity and related services such as content filtering, as recommended by Becta, which will help convergence toward a coherent national digital infrastructure. There is also the expected increase in high-bandwidth connections to the internet.

Although there is generally a high level of availability and access to the internet for both staff and pupils, a number of secondary and SEN/PRU schools still do not use email at all. Home access is not very widely available, but school websites are being used in a number of ways to provide information to pupils, parents and others.

While some recent high-profile technologies such as tablet PCs do not appear to have taken off as expected, use of some other technologies has increased – with numbers of interactive whiteboards and PDAs in schools rising quite significantly.

Most schools have a high-speed local area network, and virtually all secondary schools use some form of centrally managed client-server configuration. On the other hand, a significant number of primary and SEN/PRU schools still use peer-to-peer configurations. A large proportion of schools have invested in wireless technology, but apparently only a few schools have a clear understanding of the additional security issues involved.

Overall a large number of schools take infrastructure advice and services from local and regional authorities, yet many schools – particularly secondary schools – are likely to take advice from their suppliers. This shows an increasing requirement to educate suppliers in the vision of a national digital infrastructure.

There appears to be a lack of logical security, data-backup and disaster-recovery procedures in place, but schools are generally fairly rigorous about physically locking away or otherwise securing their ICT equipment.

There is still a reluctance to make MIS data available on the wider network, and we found only a very low take-up in the use of technology for non-educational purposes such as access to buildings and cashless catering.

It is good to see that a majority of schools are obtaining electronic learning materials and sharing them in some way. However, only a small number are sharing such resources outside of their institutions, even though a high proportion of schools have the facility to do so via their website.



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