Independent Evaluation of the uses of Espresso online digital resources in primary schools

Final Report – Attainment and Usage Levels

Don Passey

Senior Research Fellow
Department of Educational Research, Lancaster University

Acknowledgements
The author would like to thank most sincerely the head teachers and teachers who have willingly and openly provided evidence that has contributed to this report. Thanks are due also to the Espresso staff, particularly Lewis Bronze, Christine Major and Tony Tintirello, who have in no small measure not only made this study possible, but who have continued to strongly support the evaluation. Individuals and schools in this report have not been named, in order to ensure anonymity, which is an important requirement for those involved and willing to provide evidence for research of this nature - this should in no way be seen as devaluing the huge commitment and contribution played by all involved.

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THE REPORT

In 2010, Espresso commissioned an academically-based and fully independent evaluation study to explore outcomes of uses of its online resources in primary schools. The aims of the study were to explore how Espresso resources are used to support teaching and learning, to assess cost and associated benefits arising, and to explore whether levels or types of use in schools might be associated with measures of pupil achievement and school performance.

The evaluation that was undertaken drew on a range of different forms of evidence, analysed in ways to match the needs of the specific aims being explored. In order to make the full report of the study and its findings more easily accessible, and to enable the reader to focus on selected aspects of specific interest, the entire report has been divided into four sections.

Section 1 Summary – this section contains two main elements, Report Headlines and an Executive Summary.

Section 2 School Uses and Learning Impacts – this includes an introduction and background to the study, details of the structure of the study relating to school uses and learning impacts, descriptions of schools providing evidence, details of how Espresso resources are used in schools and learning outcomes related to these, the pedagogies that teachers adopt when using the resources, and key aspects of learning that are impacted by uses of Espresso resources.

Section 3 Management, Time and Cost Benefits – this includes an introduction and background to the study, details of the structure of the study relating to management, time and cost benefits, details of benefits arising, and how these are calculated at school and wider levels.

Section 4 Attainment and Usage Levels – this includes an introduction and background to the study, details of the structure of the study relating to attainment, performance and usage levels, the forms of data that were gathered and used for this element of the study, and the forms of analysis that were undertaken, together with a range of detailed statistical findings.

1. INTRODUCTION

Espresso online digital resources have been developed and made available to schools since 1998, when the National Grid for Learning (NGfL) initiative was launched by the government department for education. The company was able, through a £91,000 grant won in 1997 from the British National Space Centre, to set up its first online distribution trials. Since that time, Espresso resources have been created continuously, made accessible, and used widely by teachers and learners in primary and secondary schools. A distinctive interface associated with Espresso resources has been used since those early days, and the Espresso services for schools are maintained currently through dedicated teams who provide technical support and training, direct school contact, and training sessions (5,000 were run in 2009, which covered training for senior managers as well as for teachers). Espresso provides both support (training and helplines) and digital resources in the form of Espresso resources (to 9,867 primary schools in April 2011), and in the form of Clipbank resources (to 680 secondary schools in April 2011).

Subscription to Espresso is based largely on pupil numbers in a school. In early 2011, a 2-year subscription would cost a school £5 per pupil on average, plus 75p per pupil on average for pupil home access, and £75 per school for access to Content Club. A subscription includes teacher home access, as well as an annual training session for each school (which is a popular feature with schools).

Resources are offered to schools in a number of forms, and are organised for teachers and learners in areas associated with specific Key Stages, subjects, and topics. Resources are provided in text, image and video formats. News items are provided weekly, both in 'News Bite' form, as well as in formats that are longer and include more detail (see Figure 1). Text-based news articles are produced in three different formats – in original newspaper format, in an Espresso format, and in a summary format (the three formats being differentiated according to language and literacy levels). Video clips are a key feature of the resources; they can now be played in different ways – using coupled video and audio, or in audio form only, or in video form only.

Figure 1: News items are provided in different formats to suit different learning needs

Espresso resources are characterised by certain features that set them apart from other sets of online resources. The interface for teachers and pupils is clear, colourful, and uncluttered. A number of recognisable characters appear with the resources, but the resources are largely teacher-based, rather than providing standalone learner-based activities (which is the focus of other online resource sets). Espresso resources are rich not just in visual terms, but also in auditory terms, and in terms of use of short video clips. The material provided is as 'real' as possible (rather than being largely cartoon-based), and is kept 'up-to-date'. By comparison, other online resource sets are less video-based, or provide less 'real' material, or offer test exercises rather than focal topics aimed at raising awareness to ideas and knowledge and stimulating discussion. The distinctiveness of Espresso resources means that they can be considered by teachers and learners to be complementary to other sets of resources. For example, TES Connect resources are largely created by teachers and while they can be downloaded they exist in a wide variety of formats (TES Connect, 2011), Education City resources are concerned more with learner activity and many are highly cartoon-based (Education City, 2010), and Sam Learning resources provide test banks, albeit in different formats, using drag and drop and box completion exercises, for example (SAM Learning, n.d.).

Espresso resources are popular with schools, and many schools subscribe to these resource banks, either individually, or through local authorities (LAs) or regional broadband consortia (RBCs). The resource banks are held on server systems, and Espresso accommodates access through a range of different server facilities. In September 2010, a total of 8,978 primary schools subscribed to the resources. The numbers of schools that gained access through particular server systems is shown in Table 1.

Table 1: Numbers of schools gaining access through different server systems

Server system	Numbers of schools gaining access
Linux boxes	3,491
Cachepilot equipment	3,462
Atomwide servers	409
CLEO servers	748
Old Linux boxes	439
Other servers	429
Total	**8,978**

Although access to resources has been provided through server systems, historically, Espresso has not gathered any usage statistics to provide data about forms, levels or types of access. The needs of the current evaluation have highlighted some benefits that might be gained from having access to certain statistics, and Espresso has trialled and put systems in place to provide levels of access to some usage statistics that were essential to this component of the study.

2. THE INDEPENDENT EVALUATION STUDY

Espresso has commissioned this academically-based and fully independent evaluation study to explore outcomes of uses of its online resources in primary and secondary schools. For this evaluation, there are three complementary aspects to, or aims of, the study. In this section of the report, it is the third of those aims that are detailed: An exploration of how levels or forms or patterns of usage of Espresso resources in primary schools might be associated with existing measures of achievement (levels of attainment measured by national Standard Assessment Tasks – SATs, or levels of school performance measured and reported in Ofsted reports).

2.1 Overall study design relating to aspects of attainment and usage levels

The core element of the study that has gathered essential evaluation evidence relating to aspects of attainment and usage statistics is:

- A review of data collected by Espresso about levels of usage of resources, and how they might relate to existing measures of achievement of schools.

2.2 Data for the third component of the study

For the purposes of this third component of the evaluation, data about usage (numbers of logons, numbers of pages accessed, total time online, and numbers of days when logons occurred) was provided by Espresso. Espresso set up data gathering mechanisms to capture these forms of data for a maximum of some 3,000 schools (those gaining access through Linux server boxes).

For the initial stage of this component of the evaluation, data from a selection of some 100 schools covering the period from January to the end of October 2010 were selected. Espresso provided at the outset a list of schools where there was sufficient data about usage, and from this list, a sample of 100 schools for the analysis was randomly selected by the evaluation team. Usage data provided by Espresso related those data to individual named schools, and additional data was sourced to detail school SATs results. Associations and correlations between levels of usage of Espresso resources, and existing measures of achievement of schools (levels of attainment through SATs), were explored. Patterns of use and outcomes relating to levels of free school meals (FSM), special educational needs (SEN), socio-economic, rurality, size of school, teacher:pupil ratio, and classroom planning factors were all explored.

As the usage data that were initially used did not perfectly match in time terms to the data reported about attainment results, a further selection of 100 schools was chosen, so that more valid and potentially reliable analyses could be undertaken. Analyses of this entire sample and their relationship to attainment results were completed, and further analyses were undertaken where schools were selected on the basis of levels of reported attainment. Similarly, analyses looking at potential relationship between usage and performance reported by Ofsted were undertaken, as well as an analysis exploring patterns of usage.

3. EXPLORING ACCESS AND USAGE DATA

3.1 Comparing usage of Espresso resources with achievement measures

It should be recognised from the outset that the interpretation of outcomes of the analyses undertaken in this section needs to be considered appropriately, and with some caution. It was clear from evidence gained from the initial set of interviews with teachers that Espresso resources were being used in a range of ways, and were being seen to support learning in a range of ways. However, although many of the strong and fundamental outcomes of uses that were being recognised fell within areas of megacognition, cognition and social aspects of learning, there is a need to consider the impact of particular forms of memorisation and recall. It is these latter elements that are often fundamental to success in tests and examinations, and indeed Espresso resources have not in the past strongly focused on these aspects of pedagogic need for tests and examinations specifically (although resources currently being deployed do focus in this area much more strongly). It is important to note here that memorisation and recall for tests and examinations often need to rely upon textual recall and memorisation, while forms of memorisation and recall that learners relate in practice often involves visual, auditory, kinaesthetic or emotional associations much more. There is, therefore, a potential mismatch between memory needs described in practice, and memory needs required for test practice. Espresso resources clearly support memory needs that relate to learner practice, associated with visual, auditory, kinaesthetic and emotional aspects of relationship.

Consider also the assumption that might be made that usage level (amount of exposure and use) is an indicator that can itself lead to positive impact. It should be recognised that this assumption might either be misleading or indeed false; from evidence gathered from teachers, it is clear that appropriate and targeted pedagogic support is a vital element in bringing about positive outcomes when resources are used. So, high levels of usage could actually be an indicator of an absence of teacher support or less teacher-supported uses (if then learners are given free rein to use resources, without a great deal of teacher support or guidance). If this less teacher-supported activity was the case, usage levels might well correlate negatively with attainment (more usage is associated with less guidance, which leads to lower attainment). Alternatively, of course, teachers could be using Espresso resources at different levels with different groups to support aspects of learning concerned with learning needs including tests, but that the resultant increases in attainment levels are not different, but are, in fact, similar. In other words, where teachers recognise a class or group that need more support, they are given that support with higher levels of usage of Espresso resources, but then the results of that class or group are at similar levels to those that are not recognised as needing the same levels of support. In this case, usage would be correlated negatively to any needs for additional support (as those learners using resources more would start at lower attainment levels), but resultant attainment levels would show no strong correlation to usage levels. Additionally, it is also difficult to know exactly when usage might lead to positive attainment gain; it could be for some pupils that revision in December is important, while for others it is more important in March. Not knowing how the time period when usage occurs relates to attainment, therefore, does not allow a focused analysis to be undertaken (especially at a pupil level, where ultimately the gains are identified). Taking these factors into account (lack of full match of resources to revision and memorisation needs for tests, lack of knowledge of how usage levels relate to important aspects of teacher support, and lack of knowledge of when usage would best support revisions needs of pupils) it could well be anticipated that this form of correlation analysis would not result in any strong positive correlation outcomes. Although this brings into question the issue of whether these analyses might produce results that can be usefully interpreted, it was nevertheless felt that, as this was an exploratory study, identifying where and how gains might arise would be worthwhile. However, if the ways that factors influence levels of use and related attainment are considered, then it should be recognised at the outset that null results might well be expected.

3.2 Data provided by Espresso

Undertaking these forms of analysis requires data to be collected and then integrated into a structure that will allow possible analysis. These data need to be gathered both from usage sources and from

nationally reported sources. For the purposes of this element of the evaluation, Espresso made available a range of usage statistics from a number of schools. Specific software code was written by Espresso to extract details from log files, and by September 2010 this code had been written and applied to all school users on the Linux box servers. This enabled access to usage statistics for some 3,500 schools, and of those, data could be sourced from about 2008 for some 2,000 schools (although it should be noted that these data were not always complete for all months across a school year). For selected schools, data included the school name, the identity of the school used by Espresso, or their DFE number. Data shown in the generated reports covered monthly access, by days of the week, time of the day, and duration of visits. Numbers of hits on a page were also accessed, as well as the types of files accessed (such as numbers of video files), and top user pages.

3.3 Glossary of terms used to describe usage statistics

In order to ensure that usage data were being interpreted appropriately and correctly, Espresso provided a glossary of terms used within the reports provided. Verbatim descriptions are provided here.

> ***Unique Visitor**: A unique visitor is a person or computer (host) that has made at least 1 hit on 1 page of your web site during the current period shown by the report. If this user makes several visits during this period, it is counted only once. Visitors are tracked by IP address, so if multiple users are accessing your site from the same IP (such as a home or office network), they will be counted as a single unique visitor. The period shown by AWStats reports is by default the current month. However if you use AWStats as a CGI you can click on the "year" link to have a report for all the year. In such a report, [the] period is a full year, so Unique Visitors are [the] number of hosts that have made at least 1 hit on 1 page of your web site during the year.*
>
> ***Visits**: Number of visits made by all visitors. Think "session" here, say a unique IP accesses a page, and then requests three other pages within an hour. All of the "pages" are included in the visit; therefore you should expect multiple pages per visit and multiple visits per unique visitor (assuming that some of the unique IPs are logged with more than an hour between requests).*
>
> ***Pages**: The number of "pages" viewed by visitors. Pages are usually HTML, PHP or ASP files, not images or other files requested as a result of loading a "Page" (like js,css... files). Files listed in the NotPageList config parameter (and match an entry of OnlyFiles config parameter if used) are not counted as "Pages".*
>
> ***Hits**: Any files requested from the server (including files that are "Pages") except those that match the SkipFiles config parameter.*
>
> ***Bandwidth**: Total number of bytes for pages, images and files downloaded by web browsing. Note 1: Of course, this number includes only traffic for web only (or mail only, or ftp only depending on value of LogType). Note 2: This number does not include technical header data size used inside the HTTP or HTTPS protocol or by protocols at a lower level (TCP, IP...). Because of two previous notes, this number is often lower than bandwidth reported by your provider (your provider counts in most cases bandwidth at a lower level and includes all IP and UDP traffic).*
>
> ***Entry Page**: First page viewed by a visitor during its visit. Note: When a visit started at end of month to end at beginning of next month, you might have an Entry page for the month report and no Exit pages. That's why Entry pages can be different than Exit pages.*

***Exit Page**: Last page viewed by a visitor during its visit. Note: When a visit started at end of month to end at beginning of next month, you might have an Entry page for the month report and no Exit pages. That's why Entry pages can be different than Exit pages.*

***Session Duration**: The time a visitor spent on your site for each visit. The duration of some Visits is 'unknown' because they can't always be calculated. This is the major reason for this: Visit was not finished when 'update' occurred; Visit started the last hour (after 23:00) of the last day of a month (a technical reason prevents AWStats from calculating duration of such sessions).*

3.4 Reading the URLs provided within reports of usage statistics

As well as these forms of statistics, the reports also showed the names of specific URLs that had been accessed. These allowed pages to be identified that were commonly used, and the names of the URLs provided indicators of the age groups and subject topics that were being accessed. In order to ensure that these access data were being interpreted appropriately and correctly, Espresso provided details of the indicators that might be used. Verbatim descriptions are provided here.

Every URL will contain a clue to help identify the key stage, the subject and the type of asset the user has accessed most regularly. Below is an overview of what to look out for…

What do the URLs mean?

- *EY – Early Years.*
- *E1 – English Key Stage 1.*
- *E2 – English Key Stage 2.*
- *M1 – Maths Key Stage 1.*
- *M2 – Maths Key Stage 2.*
- *T1 – Topics Key Stage 1 (history, geography, PSHE, RE etc).*
- *T2 – Topics Key Stage 2 (as above).*

You will also see the names of modules listed, e.g:
/espresso/modules/ey_animal_moves/activities/activity_sound_anim...
This URL tells me the user has been accessing Early Years level multimedia with the 'Animal Moves' module

- *EY – Early Years*
- *Animal Moves – name of an EY module*
- *Activities – The multimedia section of the module*

/espresso/modules/ey_big_books/frog_assets/frogSong_2.mp3
This URL tells me the user has been accessing a song for Early Years literacy development

- *EY – Early Years level*
- *Big Book – name of module*
- *Frog Song – name of resource*

/espresso/modules/news/ey_news/
This URL tells me the user has been accessing our news resources for the Early Years level

- *News – main news page within that level (we also have Key Stage 1 and Key Stage 2)*
- *Early Years News – news for early years*

/espresso/modules/t2_faiths/
This URL tells me the user has been accessing Key Stage 2 RE resources looking at Faiths

- *T2 – Topics in Key Stage 2 (where our RE resources are categorised)*
- *T2_faiths – Faiths module in Key Stage 2 topics*

3.5 Data fields selected for analysis

For analyses detailed later, in sub-sections 3.6 to 3.9, two data sets were used, one from national and publicly accessible reports, and the other from usage statistics supplied by Espresso. The fields within the two data sets that were selected and used were as follows:

- Data set from national and publicly accessible reports:
  - Age pupils start at the school.
  - Age pupils leave the school.
  - Locality (inner city, market town, suburban, rural).
  - Number of pupils on roll (total full-time equivalent - fte).
  - Number of pupils receiving free school meals (well above average, above average, about average, below average, well below average) .
  - Percentage of pupils with statements of special educational needs associated with School Action Plus.
  - Percentage of pupils with special educational needs but without statements.
  - Number of pupils from minority ethnic backgrounds (majority, most, about half, under half, few, very few, none).
  - Number of teachers in the school (fte).
  - Pupil to teacher ratio.
  - End of Key Stage 2 SAT results for 2007 in English (percentage Level 4+).
  - End of Key Stage 2 SAT results for 2007 in mathematics (percentage Level 4+).
  - End of Key Stage 2 SAT results for 2007 in science (percentage Level 4+).
  - End of Key Stage 2 SAT results for 2007 in English (percentage Level 5+).
  - End of Key Stage 2 SAT results for 2007 in mathematics (percentage Level 5+).
  - End of Key Stage 2 SAT results for 2007 in science (percentage Level 5+).
  - End of Key Stage 2 SAT results for 2008 in English (percentage Level 4+).
  - End of Key Stage 2 SAT results for 2008 in mathematics (percentage Level 4+).
  - End of Key Stage 2 SAT results for 2008 in science (percentage Level 4+).
  - End of Key Stage 2 SAT results for 2008 in English (percentage Level 5+).
  - End of Key Stage 2 SAT results for 2008 in mathematics (percentage Level 5+).
  - End of Key Stage 2 SAT results for 2008 in science (percentage Level 5+).
  - End of Key Stage 2 SAT results for 2009 in English (percentage Level 4+).
  - End of Key Stage 2 SAT results for 2009 in mathematics (percentage Level 4+).
  - End of Key Stage 2 SAT results for 2009 science (percentage Level 4+).
  - End of Key Stage 2 SAT results for 2009 in English (percentage Level 5+).
  - End of Key Stage 2 SAT results for 2009 in mathematics (percentage Level 5+).
  - End of Key Stage 2 SAT results for 2009 science (percentage Level 5+).
- Data set from usage statistics:
  - Number of visits January 2010.
  - Number of pages January 2010.
  - Bandwidth (Mb) January 2010.
  - Number of visits February 2010.
  - Number of pages February 2010.
  - Bandwidth (Mb) February 2010.
  - Number of visits March 2010.
  - Number of pages March 2010.
  - Bandwidth (Mb) March 2010.
  - Number of visits April 2010.
  - Number of pages April 2010.
  - Bandwidth (Mb) April 2010.
  - Number of visits May 2010.
  - Number of pages May 2010.
  - Bandwidth (Mb) May 2010.

- Number of visits June 2010.
- Number of pages June 2010.
- Bandwidth (Mb) June 2010.
- Number of visits July 2010.
- Number of pages July 2010.
- Bandwidth (Mb) July 2010.
- Percentage hits image file (gif).
- Percentage hits image file (jpg).
- Percentage hits Java Script file (js).
- Percentage hits Adobe Flash Animation file (swf).
- Percentage hits audio file (mp3).
- Percentage hits video file (mpg).

3.6 Analyses using these data

These data were integrated into a single spreadsheet file, and transferred into a statistical analysis package (SPSS). Three different forms of analysis were undertaken:

- Descriptive statistics - to describe the school population in terms of each of the elements listed above.
- An initial crosstab analysis - to indicate relationships between each of the pairs of elements listed above.
- Correlation analyses - to indicate any potentially positive statistical relationships between selected pairs of data fields.

3.7 Descriptions of the school population and the related usage data

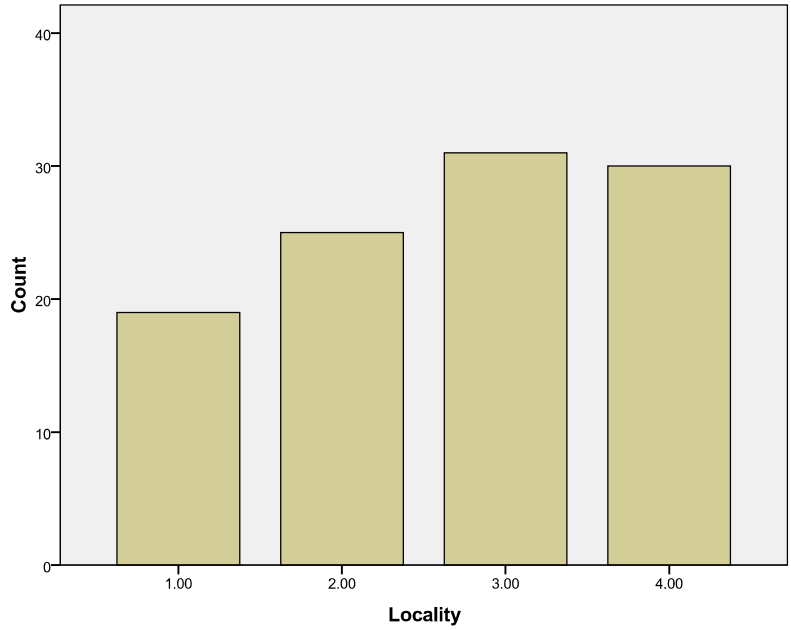
From the large number of school usage statistics that could have been accessed, school usage statistics were selected initially by taking the first 100 schools alphabetically from the full LA and school list. Files of usage statistics reporting access from January to October 2010 were received and used for subsequent analyses. In total, background and usage data on 106 selected schools were analysed. Some elements of data were missing in some categories, and these were noted within the descriptive statistics generated and shown in results in this sub-section.

It should be noted that while descriptive statistics gave an indication of the breadth of populations and the populations of data, as the usage statistics for the initial set of data were for the January to July 2010 period and the SATs results provided for the schools were those up to 2009, the usage statistics might not have entirely represented the true values that would have related directly to SAT outcomes. However, it was necessary to use an initial set of data to explore the methods within these analyses. To address the time-match issue, another set of schools and usage data statistics were subsequently analysed, using the same techniques, to ensure that sets of data were comparable and representative of teacher and pupil uses and outcomes within the same time periods. These analyses and their outcomes are reported in sub-section 3.9.

Locality

School localities of the initial school sample were identified; codes used were 1 for inner city, 2 for market town, 3 for suburban, and 4 for rural location. Figure 2 shows that each type of locality was well represented in this sample.

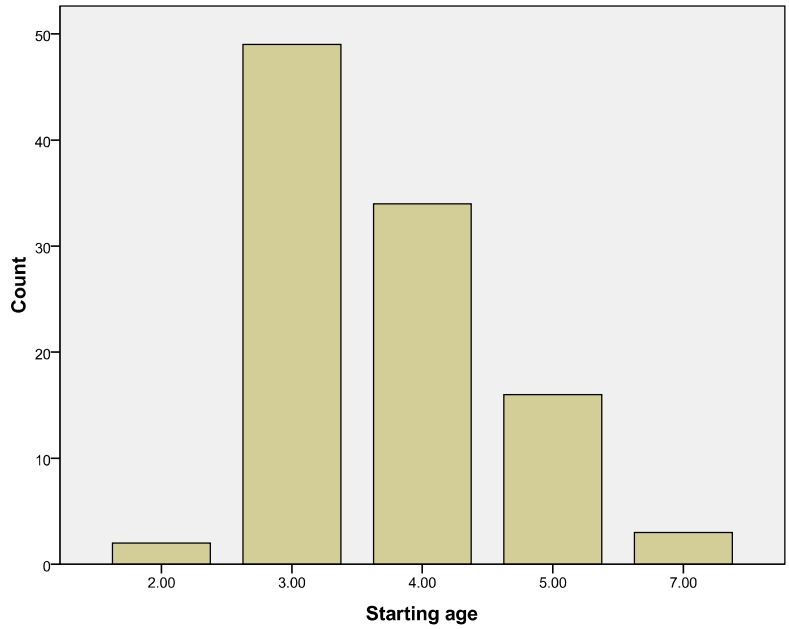
Figure 2: Frequencies of schools in different types of locality



Starting ages of pupils in the schools

The starting ages of pupils in the schools were identified. Figure 3 shows that most schools in the sample were primary and infant schools, with nursery classes. A small number of junior schools (some 4%) were also included.

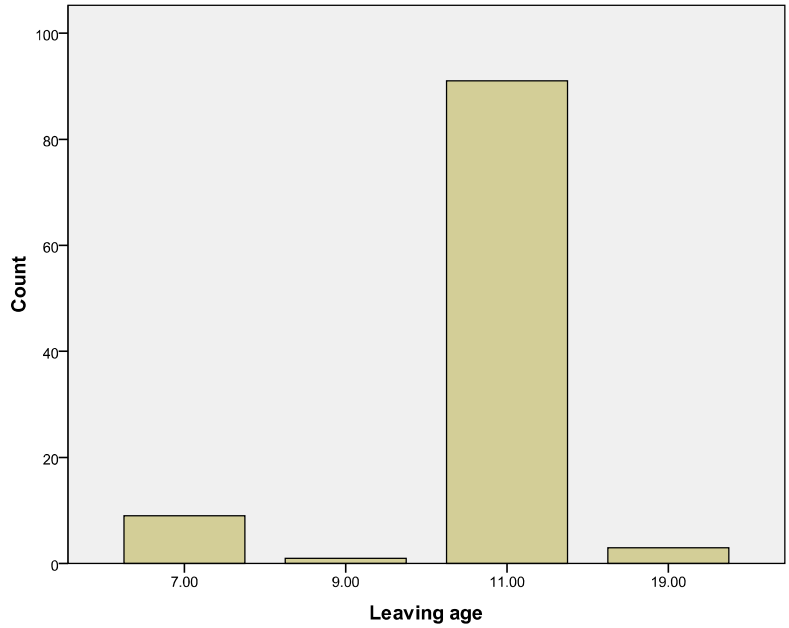
Figure 3: Frequencies of starting ages of pupils in the schools



Leaving ages of pupils in the schools

The leaving ages of pupils in the schools were identified. Figure 4 shows that most schools in the sample were primary and junior schools, with about 10% of the sample being infant schools, and a small number of special schools were included also.

Figure 4: Frequencies of leaving ages of pupils in the schools



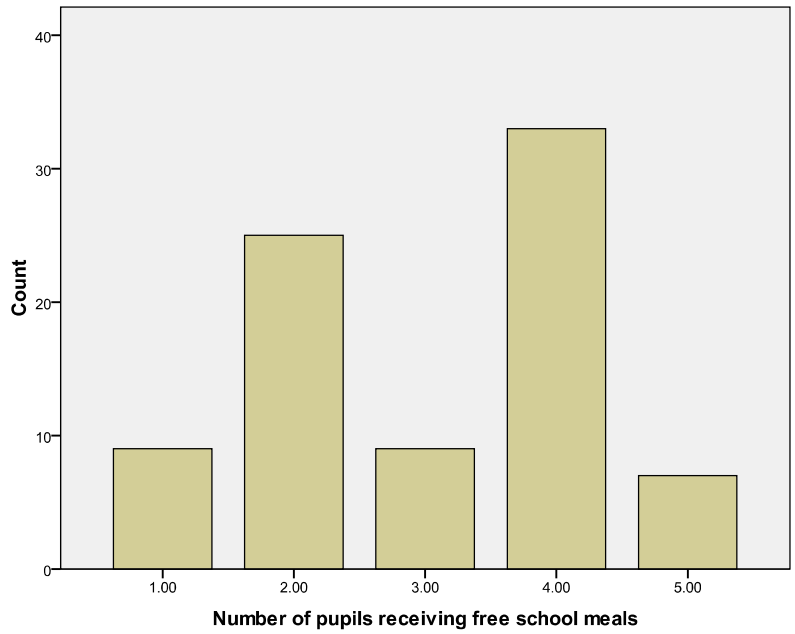
Numbers of pupils in the schools

The numbers of pupils on roll were identified. The range spanned from 62 to 721 pupils.

Numbers of pupils receiving free school meals

The numbers of pupils receiving free school meals were identified; codes used were 1 for well above average, 2 for above average, 3 for about average, 4 for below average, and 5 for well below average. Figure 5 shows that each category was represented in this sample, with slightly more schools where numbers of pupils receiving free school meals were below average.

Figure 5: Frequencies of pupils receiving free school meals by category

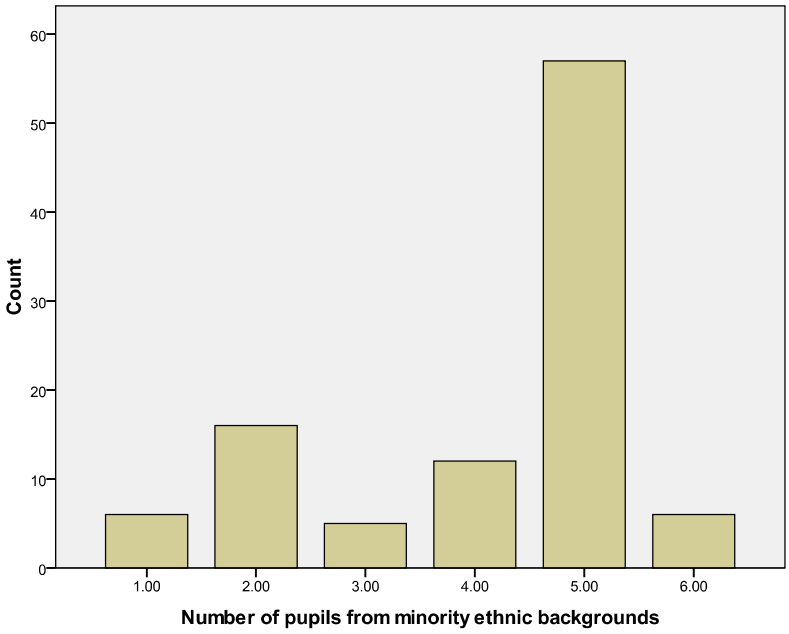


Numbers of pupils with statements of special educational need supported through School Action Plus
The numbers of pupils with statements of special educational need supported through School Action Plus were identified. The range spanned from 1% to 36%.

Numbers of pupils with special educational needs but without statements
The numbers of pupils with special educational needs but without statements were identified. The range spanned from 1.3% to 69%.

Numbers of pupils from ethnic minority backgrounds
The numbers of pupils from ethnic minority backgrounds were identified; codes used were 1 for the majority of pupils in the school were from ethnic minority backgrounds, 2 for most, 3 for about half, 4 for under half, 5 for few, 6 for very few, and 7 for none. Figure 6 shows that each category was represented in this sample, with more schools with few pupils from minority ethnic backgrounds represented.

Figure 6: Frequencies of numbers of pupils from ethnic minority backgrounds in the schools



Numbers of teachers in the school
The numbers of teachers in the school were identified. The range spanned from 3.3 to 30 ftes.

Pupil to teacher ratios
The pupil-to-teacher ratios were identified. The range spanned from 8.6 to 32.5 pupils to a teacher on average.

End of Key Stage 2 SAT results for 2007
The end of Key Stage 2 SAT results for 2007 were identified, and the range of percentages attained in English, mathematics and science for level 4 and above, and level 5 and above are shown in Table 2. Schools represented in the sample covered a wide range with respect to levels of attainment gained.

Table 2: Range of percentages achieved in SATs results at the end of 2007

Subject	Lowest percentage for level 4 and above	Highest percentage for level 4 and above	Lowest percentage for level 5 and above	Highest percentage for level 5 and above
English	60	100	8	79
Mathematics	47	100	4	75
Science	25	100	11	93

End of Key Stage 2 SAT results for 2008

The end of Key Stage 2 SAT results for 2008 were identified, and the range of percentages attained in English, mathematics and science for level 4 and above, and level 5 and above are shown in Table 3. Schools represented in the sample covered a wide range with respect to levels of attainment gained.

Table 3: Range of percentages achieved in SATs results at the end of 2008

Subject	Lowest percentage for level 4 and above	Highest percentage for level 4 and above	Lowest percentage for level 5 and above	Highest percentage for level 5 and above
English	59	100	3	73
Mathematics	54	100	8	77
Science	59	100	4	91

End of Key Stage 2 SAT results for 2009

The end of Key Stage 2 SAT results for 2009 were identified, and the range of percentages attained in English, mathematics and science for level 4 and above, and level 5 and above are shown in Table 4. Schools represented in the sample covered a wide range with respect to levels of attainment gained.

Table 4: Range of percentages achieved in SATs results at the end of 2009

Subject	Lowest percentage for level 4 and above	Highest percentage for level 4 and above	Lowest percentage for level 5 and above	Highest percentage for level 5 and above
English	54	100	5	81
Mathematics	35	100	12	83
Science	61	100	12	84

Number of visits

Numbers of visits to Espresso resources by each school were identified for each month from January to July 2010. The range of numbers of visits is shown in Table 5. Schools represented in the sample covered a wide range with respect to numbers of visits to the resources.

Table 5: Range of numbers of visits by schools across the period January to July 2010

Month	Lowest number of visits	Highest number of visits
January 2010	3	732
February 2010	4	796
March 2010	3	1,117
April 2010	4	91
May 2010	3	2,759
June 2010	3	777
July 2010	1	665

Pages

Numbers of pages of Espresso resources accessed by each school were identified for each month from January to July 2010. The range of numbers of pages accessed is shown in Table 6. Schools represented in the sample covered a wide range with respect to numbers of pages accessed.

Table 6: Range of numbers of pages accessed by schools across the period January to July 2010

Month	Lowest number of pages accessed	Highest number of pages accessed
January 2010	14	182,596
February 2010	41	38,391
March 2010	59	121,131
April 2010	30	29,854
May 2010	16	44,822
June 2010	9	72,415
July 2010	2	35,995

Percentage hits on specific types of file

Percentages of hits by each school on different specific types of Espresso files were identified. The range of percentage hits is shown in Table 7. Schools represented in the sample covered a wide range with respect to hits on specific types of files.

Table 7: Range of numbers of hits on image files (gif) by schools across the period January to July 2010

Type of file	Lowest percentage hits	Highest percentage hits
Image file (gif)	23.4	75.3
Image file (jpg)	1.4	25.2
Java Script file (js)	3.8	23.7
Adobe Flash Animation file (swf)	3.8	29.2
Audio file (mp3)	0.1	6.1
Video file (mpg)	0.1	2.0

3.8 Crosstab and correlation analyses of school population descriptors against related usage data

Crosstab and correlation analyses were run for each variable descriptor of the school population against each variable descriptor of usage statistics. In this sub-section, all correlation outcomes are reported, and they are shown in full in Tables 15 to 19 within Appendices A to E. In all cases, the value of the correlation score is given, but only in cases where there are statistically significant levels of correlation (with a value 0.4 or above) is the level of significance identified and highlighted. The sets of variables explored initially were simple sets, which were not related to or modified according to any specifically selected criteria to adjust measures according to bias or inter-related dependencies. Levels of correlation (judged from the Spearman correlation statistic in cases where data were ranked or grouped, and from the Pearson correlation statistic in cases where data were continuously numeric) were identified using groupings of variables across a full range of crosstab correlation analyses.

School descriptors against number of visits

Levels of correlation for this group are indicated in Appendix A, with levels of statistical significance indicated also where levels of correlation are 0.4 or above (indicating at least a weak level of correlation). Across this set of correlation analyses, the vast majority of paired tests show no levels of high correlation - only weak correlations are indicated (a value of up to 0.3 or so). However, the lack of strong correlation is not in itself an indication of great issue. These results show that, for this sample of schools, where indicators are not adjusted for dependencies in any way, numbers of visits (sessions) by pupils are independent of locality, starting and leaving age, numbers or pupils receiving free school meals, numbers of pupils with special educational needs (either with or without statements), numbers of pupils from ethnic minority backgrounds, numbers of teachers in the school, and the pupil to teacher ratio. There are weak correlations between numbers of pupils on roll and numbers of sessions in March and June (a positive correlation, indicating higher numbers of visits for larger numbers of pupils on roll), but this would be expected in terms of more pupils involved in more sessions. With regard to numbers of sessions and end of Key Stage 2 SAT results, there is only one indicator where a weak correlation is shown (and being negative, this indicates that those who gained higher end of Key Stage 2 SAT results in English at level 4 and above experienced fewer sessions). It should be noted that no cause and effect is implied here, it is merely a statement of numerical correlation between the

two factors.

School descriptors against number of pages accessed

Levels of correlation for this group are indicated in Appendix B, with levels of statistical significance indicated also where levels of correlation are 0.4 or above (indicating at least a weak level of correlation). Across this set of correlation analyses, again the same pattern is echoed as that shown above. The vast majority of paired tests show no strong correlation. Again, these results show that, for this sample of schools, where indicators are not adjusted for any internal dependencies in any way, numbers of pages accessed by pupils are independent of locality, starting and leaving age, numbers of pupils on roll, numbers or pupils receiving free school meals, numbers of pupils with special educational needs (either with or without statements), numbers of pupils from ethnic minority backgrounds, numbers of teachers in the school, and the pupil to teacher ratio. With regard to numbers of pages accessed and end of Key Stage 2 SAT results, there are only two indicators where a weak correlation is shown (and being negative, these indicate that those pupils who gained higher end of Key Stage 2 SAT results in science and mathematics at level 4 and above accessed fewer pages). Again, it should be noted that no cause and effect is implied here; it is merely a statement of numerical correlation between the two factors.

School descriptors against bandwidth accessed

Levels of correlation for this group are indicated in Appendix C, with levels of statistical significance indicated also where levels of correlation are 0.4 or above (indicating at least a weak level of correlation). Across this set of correlation analyses, no paired tests showed levels of high correlation. The lack of strong correlation again echoed the fact that, for this sample of schools, with indicators not adjusted to account for any internal dependencies, bandwidth accessed by pupils was independent of locality, starting and leaving age, numbers of pupils on roll, numbers or pupils receiving free school meals, numbers of pupils with special educational needs (either with or without statements), numbers of pupils from ethnic minority backgrounds, numbers of teachers in the school, the pupil to teacher ratio, and end of Key Stage 2 SAT results.

School descriptors against totalled usage indicators

Levels of correlation for this group are indicated in Appendix D, with levels of statistical significance indicated only where levels of correlation are 0.4 or above (indicating at least a weak level of correlation). Numbers of sessions, numbers of pages accessed, and bandwidth accessed were all separately totalled across the 7 months, and these totals were also adjusted according to numbers of pupils on roll; correlation analyses were run, but with no indications of correlation links at the level of 0.4 or above for any of the paired indicators. Again, this supported the view that the use of Espresso resources was happening across this sample of schools, independently of locality, starting and leaving age, numbers of pupils on roll, numbers or pupils receiving free school meals, numbers of pupils with special educational needs (either with or without statements), numbers of pupils from ethnic minority backgrounds, numbers of teachers in the school, and the pupil to teacher ratio. Access was also independent of attainment outcome; pupils were experiencing and gaining access to the resources whether they gained more highly as a year group or not. There was a very slim indication (from the number of negative correlations for both numbers of sessions and numbers of pages accessed rather than the strength of correlations) that pupils in higher attaining year groups tended to gain less frequent exposure to Espresso resources. However, this tendency was not indicated for bandwidth. Subsequent analyses in sub-section 3.9 look at this point more specifically, selecting out higher attaining schools, to see if correlation tendencies are still indicated in the same sorts of ways.

School descriptors against percentage hits of file types

Levels of correlation for this group are indicated in Appendix E, with levels of statistical significance indicated also where levels of correlation are 0.4 or above (indicating at least a weak level of correlation). Across this set of correlation analyses, none of the paired tests showed strong correlation. The lack of strong correlation indicated that, for this sample of schools, where indicators were not

adjusted in any way to address any internal dependencies, types of files accessed by pupils were independent of locality, starting and leaving age, numbers of pupils on roll, numbers or pupils receiving free school meals, numbers of pupils with special educational needs (either with or without statements), numbers of pupils from ethnic minority backgrounds, numbers of teachers in the school, the pupil to teacher ratio, and the level of attainment of the year group measured by end of Key Stage 2 SATs.

Some limitations of these analyses and next steps

It should be pointed out that the analyses reported above looked at potential relationships between access and usage patterns recorded from January to July 2010, while features of schools and attainment results were recorded earlier (attainment was recorded for 2007, 2008 and 2009). Although many school features such as size and population do not shift significantly over a 3 year period or less, attainment results can vary, as well as access and usage of resources, which could include Espresso resources, since these may be chosen by different teachers or to match the specific characteristics or needs of class groups. For these latter features, therefore, further analyses were run, using data that allowed more robust relationships to be explored. The set of correlation analyses reported in sub-section 3.9 explores access and usage data and attainment results for a separate set of schools for the 2008 to 2009 school year.

3.9 Crosstab and correlation analyses of school population descriptors against related usage data for a time-matched sample

For another set of schools, crosstab and correlation analyses were run for each variable descriptor of this newly selected school population against each variable descriptor of usage statistics. In this sub-section, the only cases reported are those where there were statistically significant levels of correlation (a value of 0.4 or above, with a level of statistical significance). The sets of variables explored initially were simple sets; they were not related or adjusted for any internal dependencies, or according to any specific criteria.

Correlation results from the entire sample

For this analysis, 72 schools were selected, where attainment results at the end of Key Stage 2 in English, mathematics and science for 2007, 2008 and 2009 were known, and where there were recorded usage statistics between September 2008 and July 2009.

For these analyses, the following school indicators were recorded:

- Locality (inner city, market town, suburban, rural).
- Starting age.
- Leaving age.
- Number of pupils on roll.
- KS2 SATs 2009 English Level 4+ (%).
- KS2 SATs 2009 Maths Level 4+ (%).
- KS2 SATs 2009 Science Level 4+ (%).
- KS2 SATs 2009 English Level 5+ (%).
- KS2 SATs 2009 Maths Level 5+ (%).
- KS2 SATs 2009 Science Level 5+ (%).

The analyses calculated scores when these indicators were correlated against each of the following measures of usage:

- Number of visits September 2008 per pupil.
- Number of visits October 2008 per pupil.
- Number of visits November 2008 per pupil.
- Number of visits December 2008 per pupil.
- Number of visits January 2009 per pupil.

- Number of visits February 2009 per pupil.
- Number of visits March 2009 per pupil.
- Number of visits April 2009 per pupil.
- Number of visits May 2009 per pupil.
- Number of visits June 2009 per pupil.
- Number of visits July 2009 per pupil.
- Number of visits for the year per pupil.
- Number of pages September 2008 per pupil.
- Number of pages October 2008per pupil .
- Number of pages November 2008 per pupil.
- Number of pages December 2008 per pupil.
- Number of pages January 2009 per pupil .
- Number of pages February 2009 per pupil.
- Number of pages March 2009 per pupil.
- Number of pages April 2009 per pupil.
- Number of pages May 2009 per pupil.
- Number of pages June per pupil.
- Number of pages July 2009 per pupil.
- Number of pages for the year per pupil.
- Bandwidth (Mb) September 2008 per pupil.
- Bandwidth (Mb) October 2008 per pupil.
- Bandwidth (Mb) November 2008 per pupil.
- Bandwidth (Mb) December 2008 per pupil.
- Bandwidth (Mb) January 2009 per pupil.
- Bandwidth (Mb) February 2009 per pupil.
- Bandwidth (Mb) March 2009 per pupil.
- Bandwidth (Mb) April 2009 per pupil.
- Bandwidth (Mb) May 2009 per pupil.
- Bandwidth (Mb) June 2009 per pupil.
- Bandwidth (Mb) July 2009 per pupil.
- Total bandwidth for the year per pupil.

The methods employed are those described in sub-sections 3.6 to 3.8 above. Here, only correlation scores that were 0.4 or above, and that were shown to be statistically significant, are reported. These are shown in Table 8.

Table 8: Correlation scores from a time-matched set of schools where the value is 0.4 or more

School descriptor	Usage descriptor	Correlation value	Significance value
Leaving age	Bandwidth (Mb) February 2009 per pupil	.419	.000
No. pupils on roll	No. of visits September 2008 per pupil	-.445	.000
No. pupils on roll	No. of visits October 2008 per pupil	-.600	.000
No. pupils on roll	No. of visits December 2008 per pupil	-.557	.000
No. pupils on roll	No. of visits January 2009 per pupil	-.593	.000
No. pupils on roll	No. of visits February 2009 per pupil	-.476	.000
No. pupils on roll	No. of visits March 2009 per pupil	-.550	.000
No. pupils on roll	No. of visits April 2009 per pupil	-.462	.000
No. pupils on roll	No. of visits May 2009 per pupil	-.612	.000
No. pupils on roll	No. of visits June 2009 per pupil	-.539	.000
No. pupils on roll	No. of visits July 2009 per pupil	-.552	.000
No. pupils on roll	No. of visits for the year per pupil	-.666	.000
No. pupils on roll	No. of pages September 2008 per pupil	-.479	.000
No. pupils on roll	No. of pages October 2008 per pupil	-.554	.000
No. pupils on roll	No. of pages November 2008 per pupil	-.550	.000
No. pupils on roll	No. of pages December 2008 per pupil	-.524	.000
No. pupils on roll	No. of pages January 2009 per pupil	-.546	.000
No. pupils on roll	No. of pages February 2009 per pupil	-.445	.000
No. pupils on roll	No. of pages March 2009 per pupil	-.432	.000
No. pupils on roll	No. of pages May 2009 per pupil	-.528	.000
No. pupils on roll	No. of pages June 2009 per pupil	-.424	.000
No. pupils on roll	No. of pages July 2009 per pupil	-.437	.000
No. pupils on roll	No. of pages for the year per pupil	-.598	.000
No. pupils on roll	Bandwidth September 2008 per pupil	-.412	.000
No. pupils on roll	Bandwidth October 2008 per pupil	-.484	.000
No. pupils on roll	Bandwidth November 2008 per pupil	-.564	.000
No. pupils on roll	Bandwidth December 2008 per pupil	-.544	.000
No. pupils on roll	Bandwidth January 2009 per pupil	-.537	.000
No. pupils on roll	Bandwidth February 2009 per pupil	-.458	.000
No. pupils on roll	Bandwidth March 2009 per pupil	-.447	.000
No. pupils on roll	Bandwidth May 2009 per pupil	-.516	.000
No. pupils on roll	Bandwidth June 2009 per pupil	-.432	.000
No. pupils on roll	Bandwidth July 2009 per pupil	-.499	.000
No. pupils on roll	Bandwidth for the year per pupil	-.645	.000

Interestingly, while there were no correlation values of 0.4 or above between attainment results and usage levels, there were strong correlations between numbers of pupils on roll and all measures of usage (numbers of visits, numbers of pages, and bandwidth). It was also notable that these correlations were reported during months where there were no major holiday periods (implying that the relationship was school or teacher related). These correlations were all strongly negative, indicating that as numbers of pupils on roll increased, so the usage levels decreased. There could be different reasons that might explain this outcome: larger numbers of pupils might have had lower levels of access to technology; or larger numbers of pupils across larger numbers of classes were not supported by teachers in the same ways. Whatever the reasons, there was an indication that Espresso use was related to numbers of pupils on roll.

Looking at correlations between numbers of pupils on roll and attainment levels, there were no correlations with values of 0.4 or above. So, whilst numbers of pupils on roll were related to usage levels, these were not related to attainment results. This posed the question, of course, as to what might have happened to attainment results if all schools, irrespective of numbers of pupils on roll, provided the same levels of usage. At the moment, it is unlikely that usage statistics that are available will allow this form of analysis to be easily undertaken. An alternative would be to run an analysis of this form using statistical modelling, which would take such variable bias or dependencies into account; however, while this technique would provide an outcome, the outcome itself would need to

remain as a model, as it would not necessarily provide absolute evidence of what might happen in practice.

Correlation results from a lower attaining sample

To accommodate the earlier finding that there was a tendency for negative correlation between usage levels and attainment results, a further correlation analysis was run, where schools were selected according to attainment level results gained. Where Key Stage 2 English Level 4 and above SATs results in 2007 were 85% or above, these schools were selected out for the analysis. This left 41 schools, with lower levels of attainment results, and these schools were used to see if tendencies in direction and strength of correlation still held in the same ways.

Again, the methods employed were the same as those described above. Here, only correlation scores that were 0.4 or above, and that were shown to be statistically significant, are reported. These are shown in Table 9.

Table 9: Correlation scores from a time-matched set of schools with lower attainment in English in 2007 at levels 4+ and where the correlation score value is 0.4 or more

School descriptor	Usage descriptor	Correlation value	Significance value
Locality	No. of visits October 2008 per pupil	.429	.005
Locality	No. of visits November 2008 per pupil	.438	.004
Locality	No. of visits December 2008 per pupil	.441	.004
Locality	No. of visits February 2009 per pupil	.439	.004
Starting age	Bandwidth (Mb) January 2009 per pupil	.415	.007
No. pupils on roll	No. of visits October 2008 per pupil	-.591	.000
No. pupils on roll	No. of visits November 2008 per pupil	-.657	.000
No. pupils on roll	No. of visits December 2008 per pupil	-.598	.000
No. pupils on roll	No. of visits January 2009 per pupil	-.491	.001
No. pupils on roll	No. of visits February 2009 per pupil	-.429	.005
No. pupils on roll	No. of visits March 2009 per pupil	-.562	.000
No. pupils on roll	No. of visits May 2009 per pupil	-.545	.000
No. pupils on roll	No. of visits June 2009 per pupil	-.422	.006
No. pupils on roll	No. of visits July 2009 per pupil	-.519	.001
No. pupils on roll	No. of visits for the year per pupil	-.653	.000
No. pupils on roll	No. of pages October 2008 per pupil	-.541	.000
No. pupils on roll	No. of pages November 2008 per pupil	-.646	.000
No. pupils on roll	No. of pages December 2008 per pupil	-.559	.000
No. pupils on roll	No. of pages January 2009 per pupil	-.488	.001
No. pupils on roll	No. of pages May 2009 per pupil	-.406	.009
No. pupils on roll	No. of pages for the year per pupil	-.571	.000
No. pupils on roll	Bandwidth October 2008 per pupil	-.552	.000
No. pupils on roll	Bandwidth November 2008 per pupil	-.670	.000
No. pupils on roll	Bandwidth December 2008 per pupil	-.540	.000
No. pupils on roll	Bandwidth January 2009 per pupil	-.447	.003
No. pupils on roll	Bandwidth March 2009 per pupil	-.419	.006
No. pupils on roll	Bandwidth July 2009 per pupil	-.417	.007
No. pupils on roll	Bandwidth for the year per pupil	-.621	.000
KS2 SATs 2009 English L5+	Bandwidth September 2008 per pupil	-.424	.007

These correlation scores indicated two important outcomes for this sample: that during the first half of the school year, increasingly rural (or less urban) schools were associated with higher levels of usage by pupils; and that again, pupil numbers on roll were related to levels of usage. In the latter case, these correlation values were strongly negative, indicating again that higher levels of usage were associated with lower numbers of pupils on roll. But, as shown above, numbers of pupils on roll and attainment results were not correlated at statistically significant or high score levels.

Indeed, it is of note, perhaps, that no strong correlations between usage levels and attainment levels were shown (except in one case). Indeed, many of these correlations for subject attainment results at Level 4 or above were very largely around the neutral position; the exception was in mathematics. In all subjects where attainment results for Levels 5 and above were involved, correlation scores tended to be negative. If we compare this to the tendency shown when all attainment level groups were included, then this suggests that selecting out the higher attaining groups has indeed removed some of the greater tendency for a negative correlation (for attainment Level outcomes of 4 and above in English and science). This being the case, and the fact that at Level 5 and above there was the same tendency towards negative correlation shown (increased in values in some cases), then this still suggested (without firm evidence of statistical significance) that higher attaining groups were not using Espresso resources as much (or were not encouraged to do so by their teachers).

These results do not contradict teacher interview responses. Indeed, teachers in their responses indicated that they chose uses of Espresso resources to match pupil needs; they found that all pupils were supported (indeed many examples given described situations where pupils needed additional support or it was felt that they could gain from enhanced levels of awareness), and that the subject resources most used to support revision for tests were mathematics resources. Overall, it is perhaps important to note that from the analyses on this grouping of schools that: schools with higher numbers of pupils on roll did not tend to provide the same levels of usage as schools with smaller numbers of pupils on roll; less urban (more rural) schools tended to be associated with higher levels of pupil usage earlier in the school year; and there was a tendency for pupils gaining higher attainment results in SATs to be associated with lower levels of usage of Espresso resources.

3.10 Top 10 user pages and levels of attainment of pupils

The correlation analyses suggested that there were differences in terms of usage levels relating to levels of attainment gained. Usage statistics provided by Espresso included the top pages accessed by schools. For the 72 schools in this time-matched sample, and for the 42 schools with lower attainment results (less than 85% at Level 4 or above in English at the end of Key Stage 2 in 2009), and the 30 schools with higher attainment results (85% or above at Level 4 or above in English in 2009), the top pages accessed by users were identified. Looking at top pages accessed might indicate whether there were differences between these two samples in terms of the types of pages accessed (although it should be recognised that top pages could occur in any year group, and were not specifically related to year 6 or Key Stage 2 classes – these are the learners that relate most strongly to the SAT results in any given year).

Results for schools with lower attainment scores, the 42 schools with less than 85% of pupils attaining at Level 4 or above in English at the end of Key Stage 2 in 2009, are shown in Table 10. In this table, the top 10 pages accessed between September 2008 and July 2009 in each school were recorded. Frequencies were then used to calculate a ratio, in order to take account of the number of schools involved in this sub-sample.

Table 10: Pages most frequently accessed by those schools with lower levels of attainment

Page group	Page identifier	Frequency	Ratio
Age group	Key Stage 2	79	1.88
	Key Stage 1	53	1.26
	Early years	28	0.67
Subject	Mathematics	69	1.64
	Modules (without any further identifier)	42	1.00
	Topics	34	0.81
	Science	22	0.52
	English	17	0.40
	History	15	0.36
	Literacy	10	0.24
	Geography	6	0.14
	Music	4	0.10
	Religious education	3	0.07
	Modern foreign languages	3	0.07
Forms of activity	Activity shared sound	53	1.26
	Search	42	1.00
	Route creator	32	0.76
	News	15	0.36
	Presentation	13	0.31
	Video	9	0.21
	Web link	8	0.19
	Book reviews	1	0.02
Specific topics	Maths mansion	3	0.07
	World	3	0.07
	Egyptians	2	0.05
	Numbers 100	2	0.05
	Bites	2	0.05
	Shape and space	2	0.05
	Time	1	0.02
	Rat-a-tat-tat	1	0.02
	Premiership	1	0.02
	Plymouth	1	0.02
	Vikings	1	0.02
	Toys	1	0.02
	Mountains	1	0.02
	Weather	1	0.02

Using the 'top 10' pages as indicators of resources most commonly accessed across this group of schools, it was clear that:

- Key Stage 2 resources were accessed more than Key Stage 1 resources, which in turn were accessed more than Early Years resources.
- Mathematics was the subject that was accessed most commonly.
- Shared sound activities, search facilities and the route creator were the forms of activity most commonly accessed.
- It was difficult to identify any specific topics that were more commonly accessed than any others.

Results for schools with higher attainment scores, the 30 schools with 85% or more of pupils attaining at Level 4 or above in English at the end of Key Stage 2 in 2009, are shown in Table 11. In this table, the top 10 pages accessed between September 2008 and July 2009 in each school were recorded. Frequencies were then used to calculate a ratio, in order to take account of the number of schools involved in this sub-sample.

Table 11: Pages most frequently accessed by those schools with higher levels of attainment

Page group	Page identifier	Frequency	Ratio
Age group	Key Stage 2	42	1.40
	Key Stage 1	41	1.37
	Early years	23	0.77
Subject	Mathematics	35	1.17
	Modules (without any further identifier)	30	1.00
	Topics	32	1.07
	Science	20	0.67
	English	5	0.17
	History	10	0.33
	Literacy	8	0.27
	Geography	6	0.20
	Music	1	0.03
	Religious education	4	0.13
	Modern foreign languages	4	0.13
	Art	1	0.03
Forms of activity	Activity shared sound	44	1.47
	Search	29	0.97
	Route creator	25	0.83
	News	10	0.33
	Presentation	10	0.33
	Video	3	0.10
	Web link	5	0.17
	Book reviews	0	0.00
	Jotter	1	0.03
Specific topics	Maths mansion	1	0.03
	World	3	0.10
	Egyptians	0	0.00
	Numbers 100	1	0.03
	Bites	0	0.00
	Shape and space	0	0.00
	Time	0	0.00
	Rat-a-tat-tat	1	0.03
	Premiership	0	0.00
	Plymouth	0	0.00
	Vikings	0	0.00
	Toys	2	0.07
	Mountains	0	0.00
	Weather	0	0.00
	Counting	1	0.03
	Word machine	1	0.03
	Romans	1	0.03
	Electricity	1	0.03
	Growing plants	1	0.03
	Light	1	0.03
	Materials	1	0.03
	Habitats	1	0.03
	20th century archive	1	0.03
	Faiths	1	0.03
	Tudors	2	0.07
	Vamos	2	0.07

Using the 'top 10' pages as indicators of resources most commonly accessed across this group of schools, it is clear that:

- Key Stage 2 resources were accessed more than Key Stage 1 resources, which in turn were accessed more than Early Years resources.

- Mathematics was the subject that was accessed most commonly.
- Shared sound activities, search facilities and the route creator were the forms of activity most commonly accessed.
- It was difficult to identify any specific topics that were more commonly accessed than any others.

However, if the ratios are placed alongside each other, while patterns are similar, it is clear that there are some differences. These are shown in Table 12.

Table 12: Comparison of pages most frequently accessed by those schools in each group

Page group	Page identifier	Ratio for schools in the lower attaining group	Ratio for schools in the higher attaining group
Age group	Key Stage 2	1.88	1.40
	Key Stage 1	1.26	1.37
	Early years	0.67	0.77
Subject	Mathematics	1.64	1.17
	Modules (without any further identifier)	1.00	1.00
	Topics	0.81	1.07
	Science	0.52	0.67
	English	0.40	0.17
	History	0.36	0.33
	Literacy	0.24	0.27
	Geography	0.14	0.20
	Music	0.10	0.03
	Religious education	0.07	0.13
	Modern foreign languages	0.07	0.13
	Art	0.00	0.03
Forms of activity	Activity shared sound	1.26	1.47
	Search	1.00	0.97
	Route creator	0.76	0.83
	News	0.36	0.33
	Presentation	0.31	0.33
	Video	0.21	0.10
	Web link	0.19	0.17
	Book reviews	0.02	0.00
	Jotter	0.00	0.03
Specific topics	Maths mansion	0.07	0.03
	World	0.07	0.10
	Egyptians	0.05	0.00
	Numbers 100	0.05	0.03
	Bites	0.05	0.00
	Shape and space	0.05	0.00
	Time	0.02	0.00
	Rat-a-tat-tat	0.02	0.03
	Premiership	0.02	0.00
	Plymouth	0.02	0.00
	Vikings	0.02	0.00
	Toys	0.02	0.07
	Mountains	0.02	0.00
	Weather	0.02	0.00
	Counting	0.00	0.03
	Word machine	0.00	0.03
	Romans	0.00	0.03
	Electricity	0.00	0.03
	Growing plants	0.00	0.03

Page group	Page identifier	Ratio for schools in the lower attaining group	Ratio for schools in the higher attaining group
	Light	0.00	0.03
	Materials	0.00	0.03
	Habitats	0.00	0.03
	20th century archive	0.00	0.03
	Faiths	0.00	0.03
	Tudors	0.00	0.07
	Vamos	0.00	0.07

By comparing 'top 10' pages across these two school groups, it was clear that those with higher attainments at the end of Key Stage 2 accessed Early Years and Key Stage 1 resources more, and Key Stage 2 resources less, and that they used mathematics resources less but other topic resources more. These data suggested that the schools that were attaining higher levels at the end of Key Stage 2 were using Espresso resources earlier, preparing pupils in the longer term across the width of resources, rather than focusing later on a more particular set of subject resources. When the differences in levels of access at the different Key Stages (2, 1 and Early Years) were compared using a chi-squared test, then the differences were found to be statistically significant (χ^2=6.446, df=2, p=.004).

Some other features associated with each of the two different school groups were also considered:

- Contextual Value Added (CVA) scores at the end of the 2008 to 2009 school year.
- Key Stage 2 (KS2) SATS scores in 2009 in mathematics at Level 4 and above.
- Key Stage 2 SATS scores in 2009 in science at Level 4 and above.
- Key Stage 2 SATS scores in 2009 in English at Level 5 and above.
- Key Stage 2 SATS scores in 2009 in mathematics at Level 5 and above.
- Key Stage 2 SATS scores in 2009 in science at Level 5 and above.

Averages for each of these features for each of the school groups are shown in Table 13 following. While the averages for SAT scores differed widely, the CVA score averages did not differ as widely. However, some researchers have serious doubts about the validity of CVA scores (Gorard, 2010, for example). The differences in average scores associated with SATs at the end of Key Stage 2 for these two groups of schools suggested that there were likely to be a number of school-based factors that led to these differences. Certainly factors such as resource management, long-term planning, and preparing pupils in the longer rather than in the short-term, are all likely to be important factors.

Table 13: Average for other features associated with schools in each group

Features	Average for schools in the lower attaining group	Average for schools in the higher attaining group
CVA score at the end of the 2008 to 2009 school year	99.9	100.5
KS2 SATS score in 2009 in mathematics at Level 4 and above	75.1	90.4
KS2 SATS score in 2009 in science at Level 4 and above	86.6	95.6
KS2 SATS score in 2009 in English at Level 5 and above	24.2	38.7
KS2 SATS score in 2009 in mathematics at Level 5 and above	28.4	46.5
KS2 SATS score in 2009 in science at Level 5 and above	39.1	59.8

3.11 Crosstab and correlation analyses of Ofsted performance measures against levels of usage

For this analysis, 124 schools were selected, where Ofsted reports had been completed between 2008 and 2010, and where usage statistics were available two months before, one month before, and during the month of the Ofsted inspection itself.

For these analyses, the indicators recorded (performance measures taken from individual school Ofsted reports) were:

- Number of pupils on roll.
- Overall effectiveness of the school (Grade).
- Capacity for sustained improvement (Grade).
- Effectiveness of the Early Years Foundation Stage (Grade).
- Achievement and standards (Grade).
- Personal development and well-being (Grade).
- Quality of provision Teaching and learning (Grade).
- Quality of provision Curriculum and other activities (Grade).
- Care, guidance and support (Grade).
- Leadership and management (Grade).

In the case of the performance indicators listed above, where grades were given, these were reported at four levels, defined in the reports as follows:

- Grade 1 Outstanding.
- Grade 2 Good.
- Grade 3 Satisfactory.
- Grade 4 Inadequate.

The analyses that were undertaken, crosstab and correlation statistics, ran the indicators listed above against three measures of levels of Espresso usage:

- Number of visits per pupil two months before the Ofsted date.
- Number of visits per pupil one month before the Ofsted date.
- Number of visits per pupil the month of the Ofsted date.

The methods employed were the same as those described in sub-sections 3.6 to 3.8 above. From the results, there were no correlation scores that were 0.4 or above (although there were two scores that were shown to be statistically significant, related to care, guidance and support).

When the average scores for Ofsted performance grades were viewed, however, it was not surprising that the results were found as they were. The average Ofsted performance grades for the 124 schools are shown in Table 14 following.

Table 14: Average Ofsted performance grades (n=124)

Ofsted performance factor	Average score (1=outstanding)
Care, guidance and support (Grade)	1.70
Quality of provision Curriculum and other activities (Grade)	2.06
Leadership and management (Grade)	2.13
Capacity for sustained improvement	2.14
Effectiveness of the Early Years Foundation Stage (Grade)	2.15
Personal development and well-being (Grade)	2.15
Overall effectiveness of the school (Grade)	2.19
Quality of provision Teaching and learning (Grade)	2.19
Achievement and standards (Grade)	2.21

If the schools involved were an average sample, then the average Ofsted performance grades would be 2.5. All of the average performance grades shown for this sample in Table 14 are lower than 2.5, indicating a bias towards schools that received higher levels of Ofsted performance grades. Indeed, most of these schools clearly gained grades 1 to 3, which would have given an average of 2.0.

However, whilst these results indicated an imbalance, which did not allow a true correlation to be tested, this was in itself a potentially interesting finding. As these schools were randomly chosen (those where usage statistics and Ofsted reports were available), it indicated that the 'random sample' was biased towards those schools receiving higher Ofsted performances grades. This being the case, it could have been that these schools (which clearly focused on aspects of effective management and wide curriculum diversity), chose to use Espresso resources. This evidence in itself was not conclusive, but was an indicator that this might have been the case, and could be worthy of further consideration. Espresso did not have access to a further set of usage statistics data that would allow a more non-biased sample to be tested, however.

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APPENDIX A

Table 15: Statistically significant correlations of school descriptors against numbers of visits

School descriptor	January 2010	February 2010	March 2010	April 2010	May 2010	June 2010	July 2010
Locality	-.100	-.115	-.151	-.308	-.170	-.329	-.285
Starting age	-.271	-.302	-.192	-.265	-.133	-.236	-.197
Leaving age	-.176	-.216	-.116	-.252	-.198	-.170	-.200
Number of pupils on roll	.347	.374	.406 (*p*=.000)	.337	.118	.431 (*p*=.000)	.283
Number of pupils receiving free school meals	.068	-.032	-.097	-.314	-.122	-.235	-.247
Number of pupils with statements of special educational needs School Action Plus	-.035	-.043	.060	.000	-.057	.095	.119
Number of pupils with special educational needs but without statements	.149	-.142	-.055	-.018	-.017	.017	.043
Number of pupils from minority ethnic backgrounds	-.086	-.099	-.218	-.179	-.055	-.213	-.233
Number of teachers in the school	.192	.311	.361	.332	.058	.395	.249
Pupil to teacher ratio	.128	.141	.141	.051	.206	.085	-.035
End of Key Stage 2 SAT results for 2007 in English (percentage L4+) %	-.295	-.330	-.296	-.323	-.086	-.288	-.343
End of Key Stage 2 SAT results for 2007 in mathematics (percentage L4+) %	-.296	-.369	-.327	-.354	-.001	-.319	-.340
End of Key Stage 2 SAT results for 2007 in science (percentage L4+) %	-.088	-.156	-.180	-.189	.014	-.150	-.118
End of Key Stage 2 SAT results for 2008 in English (percentage L4+) %	-.324	-.328	-.349	-.358	-.122	-.335	-.433 (*p*=.000)
End of Key Stage 2 SAT results for2008 in mathematics (percentage L4+) %	-.250	-.300	-.270	-.271	-.064	-.230	-.259
End of Key Stage 2 SAT results for 2008 in science (percentage L4+) %	-.272	-.291	-.253	-.312	-.104	-.262	-.277

School descriptor	January 2010	February 2010	March 2010	April 2010	May 2010	June 2010	July 2010
End of Key Stage 2 SAT results for 2009 in English (percentage L4+) %	-.207	-.213	-.180	-.228	.001	-.188	-.275
End of Key Stage 2 SAT results for 2009 in mathematics (percentage L4+) %	-.125	-.169	-.217	-.252	-.018	-.190	-.266
End of Key Stage 2 SAT results for 2009 science (percentage L4+) %	-.125	-.189	-.200	-.284	-.004	-.069	-.140
End of Key Stage 2 SAT results for 2007 in English (Level 5) %	-.286	-.288	-.182	-.256	-.156	-.231	-.263
End of Key Stage 2 SAT results for 2007 in mathematics (Level 5) %	-.274	-.312	-.262	-.309	.030	-.304	-.358
End of Key Stage 2 SAT results for 2007 in science (Level 5) %	-.244	-.297	-.301	-.278	-.074	-.295	-.287
End of Key Stage 2 SAT results for 2008 in English (Level 5) %	-.121	-.157	-.168	-.217	.031	-.164	-.286
End of Key Stage 2 SAT results for 2008 in mathematics (Level 5) %	-.069	-.183	-.176	-.232	-.007	-.135	-.274
End of Key Stage 2 SAT results for 2008 in science (Level 5) %	-.130	-.204	-.180	-.207	.099	-.178	-.203
End of Key Stage 2 SAT results for 2009 in English (Level 5) %	-.096	-.147	-.129	-.178	.018	-.108	-.178
End of Key Stage 2 SAT results for 2009 in mathematics (Level 5) %	-.078	-.155	-.203	-.239	-.031	-.166	-.221
End of Key Stage 2 SAT results for 2009 science (Level 5) %	-.092	-.136	-.165	-.205	.024	-.148	-.240

APPENDIX B

Table 16: Statistically significant correlations of school descriptors against numbers of pages accessed

School descriptor	January 2010	February 2010	March 2010	April 2010	May 2010	June 2010	July 2010
Locality	-.079	-.102	-.122	-.193	-.044	-.261	-.320
Starting age	-.294	-.279	-.176	-.169	-.115	-.276	-.302
Leaving age	-.194	-.196	-.103	-.153	-.099	-.084	-.111
Number of pupils on roll	.139	.354	.101	.118	.177	.115	.213
Number of pupils receiving free school meals	.086	.012	-.098	-.208	-.061	-.190	-.350
Number of pupils with statements of special educational needs School Action Plus	-.105	-.096	.010	-.127	-.067	-.034	.043
Number of pupils with special educational needs but without statements	-.085	-.099	-.055	-.064	.025	.027	.045
Number of pupils from minority ethnic backgrounds	-.093	-.114	-.031	-.106	-.033	-.217	-.244
Number of teachers in the school	.270	.349	.185	.115	.195	.336	.269
Pupil to teacher ratio	-.011	.098	.073	-.049	.015	-.267	-.055
End of Key Stage 2 SAT results for 2007 in English (percentage L4+) %	-.034	-.306	-.205	-.079	-.154	-.331	-.194
End of Key Stage 2 SAT results for 2007 in mathematics (percentage L4+) %	.013	-.330	-.207	-.151	-.140	-.340	-.272
End of Key Stage 2 SAT results for 2007 in science (percentage L4+) %	-.033	-.208	-.156	-.044	-.090	-.244	-.126
End of Key Stage 2 SAT results for 2008 in English (percentage L4+) %	.057	-.286	-.217	-.116	-.151	-.353	-.259
End of Key Stage 2 SAT results for2008 in mathematics (percentage L4+) %	.008	-.282	-.188	-.103	-.134	-.299	-.273
End of Key Stage 2 SAT results for 2008 in science (percentage L4+) %	-.134	-.379	-.318	-.216	-.269	-.418 (*p*=.000)	-.329

School descriptor	January 2010	February 2010	March 2010	April 2010	May 2010	June 2010	July 2010
End of Key Stage 2 SAT results for 2009 in English (percentage L4+) %	-.023	-.198	-.157	-.037	-.114	-.219	-.187
End of Key Stage 2 SAT results for 2009 in mathematics (percentage L4+) %	.006	-.170	-.174	-.248	-.281	-.212	-.499 (*p*=.000)
End of Key Stage 2 SAT results for 2009 science (percentage L4+) %	-.094	-.278	-.253	-.134	-.171	-.140	-.077
End of Key Stage 2 SAT results for 2007 in English (Level 5) %	-.080	-.255	-.205	-.077	-.123	-.256	-.235
End of Key Stage 2 SAT results for 2007 in mathematics (Level 5) %	-.067	-.269	-.212	-.183	-.177	-.306	-.265
End of Key Stage 2 SAT results for 2007 in science (Level 5) %	-.076	-.288	-.233	-.118	-.162	-.340	-.221
End of Key Stage 2 SAT results for 2008 in English (Level 5) %	.007	-.167	-.167	-.078	-.132	-.212	-.241
End of Key Stage 2 SAT results for 2008 in mathematics (Level 5) %	-.048	-.199	-.210	-.045	-.140	-.189	-.254
End of Key Stage 2 SAT results for 2008 in science (Level 5) %	-.141	-.249	-.234	-.112	-.205	-.290	-.242
End of Key Stage 2 SAT results for 2009 in English (Level 5) %	-.069	-.143	-.146	-.025	-.055	-.142	-.102
End of Key Stage 2 SAT results for 2009 in mathematics (Level 5) %	-.042	-.118	-.192	-.072	-.103	-.163	-.182
End of Key Stage 2 SAT results for 2009 science (Level 5) %	-.107	-.153	-.172	-.124	-.165	-.163	-.272

APPENDIX C

Table 17: Statistically significant correlations of school descriptors against bandwidth accessed

School descriptor	January 2010	February 2010	March 2010	April 2010	May 2010	June 2010	July 2010
Locality	-.068	.011	-.055	-.118	.126	-.090	.033
Starting age	-.225	-.184	-.200	-.299	-.223	-.243	-.138
Leaving age	.071	.191	.137	.059	.144	.105	.039
Number of pupils on roll	-.041	-.107	-.096	.123	.057	-.018	.005
Number of pupils receiving free school meals	-.124	-.037	-.015	-.136	-.030	-.093	.044
Number of pupils with statements of special educational needs School Action Plus	-.134	-.135	-.120	-.120	-.086	-.075	-.136
Number of pupils with special educational needs but without statements	-.093	-.146	-.048	-.061	.026	-.077	-.103
Number of pupils from minority ethnic backgrounds	-.197	-.155	-.105	-.268	-.143	-.168	-.121
Number of teachers in the school	.053	-.079	-.091	.182	.019	.018	.023
Pupil to teacher ratio	-.118	-.107	-.102	.037	.089	-.115	.030
End of Key Stage 2 SAT results for 2007 in English (percentage L4+) %	-.032	-.003	-.070	-.011	-.160	-.099	.104
End of Key Stage 2 SAT results for 2007 in mathematics (percentage L4+) %	-.157	-.166	-.228	-.025	-.259	-.191	.178
End of Key Stage 2 SAT results for 2007 in science (percentage L4+) %	.073	.094	.025	-.048	-.019	.003	.094
End of Key Stage 2 SAT results for 2008 in English (percentage L4+) %	.006	.010	-.078	.015	-.146	-.060	.143
End of Key Stage 2 SAT results for2008 in mathematics (percentage L4+) %	-.031	-.057	-.139	-.025	-.141	-.102	.160
End of Key Stage 2 SAT results for 2008 in science (percentage L4+) %	-.064	-.059	-.181	-.055	-.240	-.152	.105

School descriptor	January 2010	February 2010	March 2010	April 2010	May 2010	June 2010	July 2010
End of Key Stage 2 SAT results for 2009 in English (percentage L4+) %	.080	.104	.088	.020	.013	.151	.156
End of Key Stage 2 SAT results for 2009 in mathematics (percentage L4+) %	-.010	.065	.092	.083	.005	.029	.097
End of Key Stage 2 SAT results for 2009 science (percentage L4+) %	-.011	.040	.008	.072	-.036	.015	.072
End of Key Stage 2 SAT results for 2007 in English (Level 5) %	.013	.020	-.027	.056	-.047	-.125	.088
End of Key Stage 2 SAT results for 2007 in mathematics (Level 5) %	-.114	-.131	-.228	.034	-.228	-.265	.111
End of Key Stage 2 SAT results for 2007 in science (Level 5) %	-.088	-.082	-.160	.063	-.217	-.201	.097
End of Key Stage 2 SAT results for 2008 in English (Level 5) %	.194	.124	.087	-.028	.028	.011	.132
End of Key Stage 2 SAT results for 2008 in mathematics (Level 5) %	.098	.046	-.069	.010	.027	-.011	.241
End of Key Stage 2 SAT results for 2008 in science (Level 5) %	.020	.035	-.034	.004	.003	-.052	.115
End of Key Stage 2 SAT results for 2009 in English (Level 5) %	.126	.130	.120	.112	.041	-.007	.144
End of Key Stage 2 SAT results for 2009 in mathematics (Level 5) %	.030	.041	.072	.198	-.027	-.037	.256
End of Key Stage 2 SAT results for 2009 science (Level 5) %	-.105	.003	-.016	.025	-.004	-.110	.200

APPENDIX D

Table 18: Statistically significant correlations of school descriptors against totalled usage indicators for January to July 2010

School descriptor	Total numbers of visits	Total numbers of pages	Total bandwidth in Mb	Total numbers of visits per pupil	Total numbers of pages per pupil	Total bandwidth in Mb per pupil
Locality	-.199	-.122	-.017	.101	.135	.107
Starting age	-.262	-.254	-.204	.069	-.013	-.070
Leaving age	-.206	-.145	.044	-.243	-.142	-.014
Number of pupils on roll	.383	.214	.007	-.219	-.140	-.105
Number of pupils receiving free school meals	-.035	-.011	-.001	.138	.135	.094
Number of pupils with statements of special educational needs School Action Plus	.032	-.088	-.140	.139	-.008	-.132
Number of pupils with special educational needs but without statements	-.054	-.052	-.103	-.056	-.073	-.106
Number of pupils from minority ethnic backgrounds	-.136	-.096	-.155	.078	.068	-.023
Number of teachers in the school	.302	.328	.026	-.186	-.019	-.097
Pupil to teacher ratio	.117	-.081	.022	-.046	-.233	-.010
End of Key Stage 2 SAT results for 2007 in English (percentage L4+) %	-.314	-.170	.100	-.205	-.092	.122
End of Key Stage 2 SAT results for 2007 in mathematics (percentage L4+) %	-.334	-.179	.162	-.219	-.129	.179
End of Key Stage 2 SAT results for 2007 in science (percentage L4+) %	-.135	-.121	.098	.012	-.024	.113
End of Key Stage 2 SAT results for 2008 in English (percentage L4+) %	-.368	-.154	.133	-.290	-.118	.143
End of Key Stage 2 SAT results for2008 in mathematics (percentage L4+) %	-.255	-.165	.144	-.179	-.134	.159
End of Key Stage 2 SAT results for 2008 in science (percentage L4+) %	-.288	-.319	.087	-.256	-.328	.108

School descriptor	Total numbers of visits	Total numbers of pages	Total bandwidth in Mb	Total numbers of visits per pupil	Total numbers of pages per pupil	Total bandwidth in Mb per pupil
End of Key Stage 2 SAT results for 2009 in English (percentage L4+) %	-.245	-.145	.155	-.099	-.038	.172
End of Key Stage 2 SAT results for 2009 in mathematics (percentage L4+) %	-.239	-.209	.101	-.112	-.153	.117
End of Key Stage 2 SAT results for 2009 science (percentage L4+) %	-.209	-.215	.072	.035	-.084	.076
End of Key Stage 2 SAT results for 2007 in English (Level 5) %	-.261	-.187	.081	-.159	-.133	.096
End of Key Stage 2 SAT results for 2007 in mathematics (Level 5) %	-.305	-.208	.086	-.228	-.174	.099
End of Key Stage 2 SAT results for 2007 in science (Level 5) %	-.280	-.207	.083	-.176	-.205	.102
End of Key Stage 2 SAT results for 2008 in English (Level 5) %	-.153	-.177	.133	-.150	-.118	.143
End of Key Stage 2 SAT results for 2008 in mathematics (Level 5) %	-.152	-.167	.224	-.119	-.151	.231
End of Key Stage 2 SAT results for 2008 in science (Level 5) %	-.176	-.239	.035	-.155	-.229	.116
End of Key Stage 2 SAT results for 2009 in English (Level 5) %	-.121	-.114	.142	.011	-.035	.156
End of Key Stage 2 SAT results for 2009 in mathematics (Level 5) %	-.168	-.143	.246	-.137	-.136	.254
End of Key Stage 2 SAT results for 2009 science (Level 5) %	-.164	-.201	.189	-.180	-.184	.195

APPENDIX E

Table 19: Statistically significant correlations of school descriptors against percentages of hits on specific file types

School descriptor	Image (gif)	Image (jpg)	Java Script (js)	Adobe Flash Animation (swf)	Audio (mp3)	Video (mpg)
Locality	-.156	-.001	.165	-.190	-.115	-.179
Starting age	.069	-.021	.063	-.140	-.112	.133
Leaving age	.175	.006	.042	-.264	-.253	-.156
Number of pupils on roll	.079	-.128	-.031	.036	-.181	.073
Number of pupils receiving free school meals	-.194	.083	.205	-.174	-.118	-.142
Number of pupils with statements of special educational needs	-.035	-.103	-.082	.071	.052	-.005
School Action Plus						
Number of pupils with special educational needs but without statements	.032	-.041	-.017	-.059	.011	.041
Number of pupils from minority ethnic backgrounds	-.184	-.102	.049	-.141	-.074	-.160
Number of teachers in the school	.063	-.159	-.074	-.079	-.179	.022
Pupil to teacher ratio	-.089	.066	.090	.186	.107	.046
End of Key Stage 2 SAT results for 2007 in English (percentage L4+) %	-.178	.161	.090	-.032	.031	-.026
End of Key Stage 2 SAT results for 2007 in mathematics (percentage L4+) %	-.145	.116	.049	-.053	-.047	.059
End of Key Stage 2 SAT results for 2007 in science (percentage L4+) %	-.208	.098	.034	.058	.154	-.085
End of Key Stage 2 SAT results for 2008 in English (percentage L4+) %	-.131	-.036	.197	-.090	-.182	.042
End of Key Stage 2 SAT results for2008 in mathematics (percentage L4+) %	-.240	.069	.290	-.003	.009	.031
End of Key Stage 2 SAT results for 2008 in science (percentage L4+) %	-.277	.100	.266	-.016	-.103	.153
End of Key Stage 2 SAT results for 2009 in English (percentage L4+) %	-.067	.158	.023	-.056	-.137	.011
End of Key Stage 2 SAT results for 2009 in mathematics (percentage L4+) %	.019	-.021	.223	.091	-.015	.176
End of Key Stage 2 SAT results for 2009 science (percentage L4+) %	-.141	.116	.138	-.074	-.131	.013
End of Key Stage 2 SAT results for 2007 in English (Level 5) %	-.126	.111	.050	-.137	-.004	-.054
End of Key Stage 2 SAT results for 2007 in mathematics (Level 5) %	-.037	.208	.091	-.099	-.095	.063
End of Key Stage 2 SAT results for 2007 in science (Level 5) %	-.129	.151	.202	-.078	-.041	-.001

School descriptor	Image (gif)	Image (jpg)	Java Script (js)	Adobe Flash Animation (swf)	Audio (mp3)	Video (mpg)
End of Key Stage 2 SAT results for 2008 in English (Level 5) %	-.041	-.013	-.032	-.069	-.145	.018
End of Key Stage 2 SAT results for 2008 in mathematics (Level 5) %	-.190	.099	.180	-.015	-.057	.066
End of Key Stage 2 SAT results for 2008 in science (Level 5) %	-.246	.082	.277	.061	.021	.036
End of Key Stage 2 SAT results for 2009 in English (Level 5) %	-.048	.062	.010	.012	-.058	.026
End of Key Stage 2 SAT results for 2009 in mathematics (Level 5) %	-.155	.102	.174	.005	-.040	.050
End of Key Stage 2 SAT results for 2009 science (Level 5) %	-.103	-.046	.152	.153	.052	.062

About the author

Dr Don Passey is a Senior Research Fellow in the Department of Educational Research at Lancaster University. He has wide experience with developing and using evaluation and research methods to look at technological innovation, and has studied and reported on outcomes of implementation and uses of leading edge technologies and their impacts on learning for over 20 years. His work has focused particularly in areas exploring implementation, management and uses of leading edge technologies for primary and secondary age pupils and teachers, in informal as well as formal learning settings, but he has undertaken studies in further education settings also. Increasingly, his focus has been on how technologies support groups of young people who find it hard to learn. His research is based strongly in grounded theory approaches, adopting integration and sequencing of appropriate ranges of qualitative and quantitative (covering wide ranges of size sampling) methods, and he has developed new analytical techniques to explore impacts of technologies on learning, which include the use of learning frameworks and gap analysis.

He has led and undertaken more than 50 research and evaluation studies over the past 10 years, the vast majority independently commissioned to support aspects of policy or practice. He has recently completed a study for Wolverhampton Local Authority (LA) on the implementation of the LP+ learning platform, is undertaking a range of studies on home access and uses of technologies to support young people's learning, has undertaken an evaluation study for the BBC looking at outcomes of the BBC News School Report project, and a number of studies for Becta looking at potential uses of technologies with young people who are not in employment, education or training (NEET). He has over the past few years undertaken a series of evaluation studies on how schools in Aston Pride have supported the development of community and home access to ICT, as well as a review of the ICT development practices and outcomes arising in Wolverhampton LA. He was commissioned by the BBC to look at learning uses and outcomes of the BBC jam resources at an early stage of their development. He previously completed studies on the role and learning benefits of IT Academies for the DfES, the use of broadcast video clips in schools and uses of multimedia support for at risk young people for the BBC, the uses of specific online learning resources for regional broadband consortia (RBCs), the ways in which ICT is linked to pupil motivation for the DfES, the role of ICT in supporting learning practices for disadvantaged communities for a NDfC project, the outcomes of uses of interactive whiteboards, and the development of e-learning practices across RBCs and local authorities (LAs). Earlier studies reported on the outcomes and implementation of Pathfinder LEAs for the DfES, the development of Year 7 online course materials for mathematics for RM, the use of a number of integrated learning systems in schools, he led a team that investigated the outcomes of laptop use in schools and homes as part of the Microsoft UK Supported Anytime, Anywhere Learning Project, and led a study for the Qualifications and Curriculum Authority (QCA) looking at the implications of uses of ICT for coursework in examination assessment.

He has worked with EU and government agencies, commercial and non-commercial groups, educational institutions and schools, in undertaking research to inform both policy and practice. He was a consultant to a previous department for education on a number of projects, which included work on the development of innovative approaches to data management systems in schools and LAs. He has worked with commercial companies in the UK, Switzerland and Germany, with state pedagogical research institutions in France, Spain and Germany, with educational groups in Hong Kong, Bermuda, and Peru, with LAs across England and Scotland, with RBCs, and with individual schools. He established, in collaboration with SSAT, a Masters in Research course in Innovation in School Practice for teacher practitioners, focusing on researching the uses of data and technologies within schools and in homes.

He is vice-chair of the International Federation for Information Processing Working Group on Information Technology in Educational Management, a member of an international Working Group on Elementary Education and ICT, and a member of the BCS Schools Expert Panel. He has written widely on aspects of leading edge ICT uses in primary and secondary education.

25th May 2011

This report has been authored by:

Don Passey
Senior Research Fellow

Invaluable background support has been provided by:

Shealagh Whytock
Research Administrator

Angela Gelston
Online Questionnaire Administrator

Alice Jesmont
Webpage Administrator

The research has been carried out within:

Department of Educational Research
Lancaster University
Lancaster, LA1 4YL

For queries about this report, please contact:

Don Passey
Senior Research Fellow
Tel: 01524 592314
Email: d.passey@lancaster.ac.uk