


Education Departments' Superhighways Initiative

Group D: Home–School Links

Final Report

Lancaster University Evaluation Group

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Evaluation methods

1. The evaluation reported throughout this group has been based upon evidence collected in a range of ways from a number of sources:

    - direct observations during site and school visits
    - discussions and interviews with project managers, school managers, teachers, pupils and parents
    - documentary evidence and materials provided by project managers and schools
    - analysis of ranges of pupil work
    - data collection from monitoring systems within some projects
    - data collection from questionnaires widely distributed to teachers, pupils and parents.

    It should be noted that, where evidence is given from questionnaire returns, the number responding (for example 13 out of 23) indicates the number of positive responses from the total number of returned questionnaires. Blank responses are not included.

Evaluation team

2. The evaluation team comprised:

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3. SUPERHIGHWAYS IN EDUCATION PROJECT

Description of project

3.1 The Superhighways in Education Project has been a company-led project, intended initially as a resource trial. The schools have taken the opportunity to be involved in the project, and the companies involved have taken a largely non-interventionist stance in the development. Hence, developing wide human networks has not been a major focus for the project. The physical networks within the schools were developed from networks already existing, and the superhighways connection has enabled cable TV, Internet, and some remote CD-ROMs to be available via the cable links. A range of early outcomes of classroom use have emerged, and the schools involved are all actively considering home–school links. Whilst initially any home–school or school–home links would have been developed entirely by chance or for opportunistic reasons, school–home cable modem links have been in place in six teacher and pupil homes since early January 1997.

Sponsors and other parties involved

3.2 The project was submitted by Research Machines plc (RM) as the lead sponsor, but is jointly run by Telewest Communications and RM, and has been jointly funded at a total cost to date of some £160,000. The project was originally based in three schools, one in Kent and two in Essex. This present evaluation has focused mainly upon the two schools in Essex, while the Kent school is part of the Kent Broadband Learning Project and is being evaluated more extensively by another group (see Report A2.3). In terms of provision for the project, Telewest have provided the cabling network, and RM have provided a regional CD-ROM server that can run both video and sound. The technology being used to deliver the provision is considered by RM to be new to the UK, but already established in use in the US. Schools involved have direct Internet access. Originally this provision was filtered by RM, but in the latter few months of the project the access became available through the Telewest network, and is now unfiltered.

Size and type of institution

3.3 Bromfords School is a GM school, with some 850 pupils, aged 11–18 years. There are 54 staff in the school. The 1995 GCSE results indicated that 47% of pupils entered gained 5 or more A to C grades. The school has a low truancy rate, and is technology focused. Structurally, the school is mostly contained in a single-storey building. The headteacher is supportive of technology development, and IT is at the top of the list of priorities for the school as a whole. The ultimate pupil : computer ratio aimed for by the school will be in the order of 3 or 4 : 1.

3.4 Woodlands School is an LEA school for pupils aged 11–16 years, with some 1150 pupils currently on role. The 1995 GCSE results indicated that 20% of pupils entered gained 5 or more A to C grades. The school is not considered to be particularly technology focused. The school IT co-ordinator's background is in programming and geography teaching.

3.5 Invicta Grammar School is a selective school in Maidstone for 11–18 year old girls. There are currently some 900 girls in the school. The school has computer resources available in the resources centre, in some specific rooms, and in clusters in subject areas. The school has a suite of 31 RM 486 machines, served by a Novell network, and 36 other 486 machines in clusters in faculty areas. Technology provision and development are high priorities in the school, with strong support from senior management.

Hardware and software used

3.6 Internal school networks run across Ethernet systems, operating at 10 Mbps. There is a dial-up system operating via the Telewest point of presence (POP). The end system equipment operating is standard PCs.

3.7 Sites can access a range of resources provided, including:

- broadcast TV via a normal set-top box
- a shared CD-ROM facility
- Internet access, with content monitoring, e-mail, and World Wide Web proxy, providing filtered access to the Internet content
- video conferencing using VDO Phone or CU-SeeMe.

3.8 Bromfords School has developed, and continues to develop, a considerable technology infrastructure across the school. The school currently has four separate networks and an open-access system in the library, a 16-machine dedicated network in the library which has access to remote CD-ROM and Internet, a network room of 20 486 machines, a room with eight 486 machines, a new network of 16 machines for English, a network of 12 machines for GNVQ work, a network of 16 machines for mathematics, three stations outside the staffroom that are dedicated for staff use and linked to the library, eight science labs with network points (16 in one lab and two in all others) and a sixth-form network of 386 machines. The network provision of IT within the school is accessed through the resource room near the library, and offers cable access to Internet and remote CD-ROMs and cable TV, providing more than 40 channels, and a seven stack CD-ROM server. The resource room contains a cable modem, five decoders, a file-server network with four file servers, and a local seven CD-ROM stack. A fifth file server will be added. From Basildon the remote CD-ROM provides access to 12 CD-ROMs.

3.9 Woodlands School has seven networked rooms in total, one being linked to the Internet. Room A64 contains the Internet connection in school. This room contains a network of 15 machines, and is allocated mainly for art and science use. It is booked by staff as needed. This room has only been equipped with its present software and hardware for the past 2 years, and staff have been retrained in the use of the packages adopted since that time, particularly Windows, Excel 5 and Word 6.

3.10 In Invicta Grammar School, there are 16 computers in the school linked to the Internet, with unlimited free access available. The room in which these machines are located is able to be booked by a department or class. The sixth-form pupils can use the facilities when they need them, while Year 7 to Year 9 pupils use them with a teacher present. The school also uses video conferencing, via an ISDN line.

External connectivity

3.11 The physical network on which sites are located is a classic cable TV system. Access is provided via cable modems that operate at 10 Mbps. This system enables easy upgrade in the future to Asynchronous Transfer Mode (ATM)/Synchronous Digital Hierarchy (SDH), which will allow users to gain a managed broadband communications access.

Background and experience of staff and institution

3.12 Bromfords School has a strong background in technology development. In March 1996, it was planned that, within 12 months, IT provision would be developed to

include an upgrade to file servers so that all users would have access to Internet and remote CD-ROM, an RM Connect network, a 16-station Success Maker network, a 16-station network for the design area, a 20-station CAD/CAM suite and a 16-station network for modern languages. By October 1996, the school had been awarded Technology College status, enabling this plan to be implemented. Phase 3 of the development, beyond the next 12 months, is planned to include two terminals in each classroom, a network in the music area, and data logging provision in science.

3.13 Originally, as part of a Year 7 study-skills introduction, word processing, spreadsheets and databases were used within study-skills lessons. IT is taught to Years 7, 8 and 9, but there are no qualifications as a result of the lessons. Currently, all pupils in the school undertake GNVQ Level 1 in IT. The school is exploring how this course can be appropriately certificated in the future. The school has its own Web page, and has video-conferencing links with a school in Canada. The school has created a central fund for ink, printer ribbons and printing accessories. The school runs clubs with primary school Year 6 pupils, in the year before they enter the school, which includes clubs on PE and IT topics. The school has invested in a secure system that alerts staff internally and emergency services externally if equipment is moved.

3.14 In Woodlands School, both Years 7 and 8 have 1 hour per week of IT-skills training, in the use of word processing, spreadsheets and databases. These skills are carried on beyond those years in other subjects. Pupils can use equipment in the main IT room autonomously, and use the IT skills they have developed previously. The IT co-ordinator believes that IT use has had a positive motivational effect upon pupils. Some pupils are known to have Internet access at home. The PC base of the school, and having professional office software as standard, are features that the IT co-ordinator believes will help to make the possibility of use and transfer between home and school more easy.

3.15 Invicta Grammar School has been concerned with developing technology in parallel with that happening in society. Using a 'show of hands' method, the school has identified that, across individual year groups, between 60 and 80% of pupils have a computer at home, between 40 and 80% use a word processor on those computers, and up to 20% have access to the Internet at home. In all cases, highest rates were found in Years 10 and 11.

Evaluation

Project initiation

3.16 This project was based upon a certain number of facts recognised by RM about CD-ROM access and use. Firstly, some CD-ROMs are used very extensively, while others are used for more limited periods of time by pupils and teachers in schools. Secondly, the number of CD-ROM stacks containing 14 drives that have been sold to schools has been limited. While in the UK there are approximately 250 CD-ROMs that will suit the PC platform for schools, there are some 7000 CD-ROMs available world wide. For the project, 12 CD-ROM titles were selected for use across the network: Library of the Future; Total Amazon; World Climate; Guardian; Plant Science; Aspects of Religion; ECCTIS; RM Sound and Vision; OED; Electricity and Magnetism; Energy Resources; and Earth and Universe. Other titles could not be used because of technological problems encountered, copyright issues, and appropriateness of titles and contents for use by children.

3.17 Originally, schools involved in this project were connected to the RM server for Internet access but, following new developments at Telewest Basildon in November 1996, schools now connect via cable to a new Telewest server. Whenever schools

or parents access Web pages, access will be monitored, and the pages will be downloaded in order to increase speed of access for future use.

3.18 Through the project, schools have been working with resources since early in 1996. Currently, the cable access is provided entirely free of charge to schools involved. Woodlands School has been linked to the cable system since March 1996, and has been linked to Internet since the Summer term 1996. In November 1995, Invicta Grammar School began working with two modems, although initial problems occurred when the equipment was installed due to its not being entirely stable. The project started in earnest in February 1996.

3.19 Project sponsors provided the CD-ROM server at Telewest offices and cable modems for the schools. The cable modems provided were multiple-user Cable Modem Bridges (LCbs) from LANcity. Each school was provided with one LCb from which 16 PCs could be run. Recently, Telewest has provided six single-user residential modems for teachers and pupils from two of the schools (three from each school) in order to facilitate connections between home and school. This equipment was funded by the sponsors. Computers were not provided for schools, as the sponsors were keen to see how schools were able to work with their existing infrastructure, so that the trial could offer commercial perspectives as well as educational ones. One school has purchased more equipment during the course of the trial.

Initial training

3.20 Initial training has been arranged through training sessions and one-to-one support. For example, in September 1995 all staff in Bromfords School were involved in an Internet training session run internally but provided by RM. Since that time, the school has run a rolling programme of training. Some more recent training for all staff was carried out in departments in October 1996.

3.21 The deputy headteacher with responsibility for the project in Bromfords School has indicated that the school adopted an approach to development of tackling the need to change staff attitudes first, and then to changing pupil attitudes. By October 1996, senior staff in the school indicated that most teachers who were initially negative had been ‘won over’.

3.22 To develop appropriate training in Bromfords School, a survey was undertaken, in which staff were asked to indicate their levels of IT competence, use of Internet, and whether they had a computer at home. As a result of the survey, teachers were paired together, and a cascade process of training was used within each department. Some staff considered specific IT uses and applications, such as video digitising in art, and the use of spreadsheets in mathematics.

Technical and educational training

3.23 Teachers in Bromfords School were asked via questionnaires about training they had received. Of the teachers reporting, most had used IT in lessons prior to using the Internet, but did not teach IT in the school. About two-thirds of the 17 teachers had used the Internet before September 1996, while the others had used it since that time.

3.24 Many teachers reported receiving awareness-raising training, with few receiving specific training sessions, only one with on-hand support, and none from use of support materials. Almost all teachers reported that the amount of training had been less than needed.

3.25 Through questionnaires most pupils reported support for use of the Internet from other pupils; about one-quarter reported support in lessons. Most pupils (281 out of 539) reported that the amount of training they had received had been considered by them to be sufficient, but about one-fifth (117 in total) indicated that it had not been sufficient. When asked how many hours of training was needed, a random selection of responses from pupils indicated that many felt that up to half an hour was sufficient (15 pupils), while most felt that between 1 and 2 hours was sufficient (60 pupils). A few, however, indicated that a great deal more time was required, for example that 24 hours or more was required.

Management strategies

External

3.26 RM were the initial lead company in this project and have openly stated that their intention was to test the technology in schools with rather different technological backgrounds. By design, RM adopted a non-interventionist approach to the schools' use of what is a substantial investment, in order to consider the trial and its outcomes without potential interventionist distortion. During the project, RM monitored availability and usage of both the Internet and the CD-ROM server, and resolved a number of issues raised by the schools, over the telephone, remotely over the Internet, or in person. RM provided significant guidance and training to the project schools involved. Telewest have recently become involved to much greater extents in the project, and their approach has been co-operative towards the schools, seeking to work alongside and resolve problems. The technology provided has been specific to the schools concerned and does not rely on links with other schools. Thus, the management structures required are not elaborate.

Internal

3.27 Management of IT development within Bromfords School consists of both strategic and tactical elements. The strategic team, which undertakes the planning, has been largely the headteacher and deputy headteacher. The tactical elements are managed by the senior master, who is concerned with enabling use and implementation. Needs for technical support are covered by a separate member of staff. The school does not have a head of IT, but recognises that it may need to buy in network management because of its increasing facilities. There are one or two technicians in school, and a local firm has offered to provide a 2-hour response time to problems when they occur.

3.28 Before using the Internet in school, the school consulted parents about appropriateness and use. Parents were assured of the supervision of Internet use at all times.

3.29 Features of the management of the project within the school are that:

- the school has set in place arrangements to manage the technical aspects of the network and ensure that it functions effectively
- there have been some opportunities for training
- the library is being used as a core area, from which the school hopes to extend the network
- access in the library means there is control over use
- the project is in the nature of an experiment, so the school has not yet formulated a clear development plan for its use; this would obviously

be of considerable help in planning the way forward; however, the project is seen as an integral part of the wider school development

- the school has indicated that it has seen already sufficient learning gains to warrant finding a way of purchasing the equipment if this had to be done at the end of the trial.

3.30 It is reported by senior staff that the use of the library has shifted significantly as a result of the project, particularly because of the very high demand for Internet access. Since the beginning of the Autumn term 1996, there has been a policy in place where effectiveness of use by pupils could be ensured to greater extents. If problems of access are found, pupils are taken off the system. This has been found to be an extremely useful deterrent.

3.31 The librarian has been a central figure in management within the library area. She has developed two forms of resource to support teachers: 'What's On the Net?', a list of Web sites, classified by subject, and numbered according to the book classification scheme used in the library; and a set of pathways, for use when requested by a department. For example, pathways have been created for the science department, offering worksheets for the pupils, giving them instructions of the sites and how to access them, and questions that require specific answers gathered from data within a specific site. Internet access is bookable as a resource within the library. Teachers can book the resource during lesson-time, sixth-form pupils on private study can book the resource during lesson-time, and other pupils can book the resource during lunch-time and after school. During lunch-times there are two half-hour slots of time available for Internet access. There is a rapidly growing club after school, and pupils can be in the library until 5.15 or 5.30 p.m.

3.32 In Woodlands School, the management of the project has been handled by the IT co-ordinator. A draft policy statement on Internet use has been created, which states that a teacher must be present when pupils are accessing the Internet. Pupils obtain a password from the IT co-ordinator or technician, and this password is changed every session. The IT co-ordinator passes on useful bookmarked sites to other heads of department, on paper.

3.33 The overall project management and co-ordination with other subject areas in Invicta Grammar School is the responsibility of the faculty manager for business and technology. A full-time IT technician looks for useful sites, and departments consider how use can be integrated into schemes of work. Senior pupils act as 'prefects of the Internet', and at times have pointed out unsuitable material present on the Internet, as well as helping younger pupils with Internet access and keeping an eye on activities.

Implementation at project and institutional levels

Creating cross-institutional relationships and support

3.34 Cross-institutional links with other schools have not been a feature of this project, but the schools have considered ways to implement links with parents and others. Evening sessions have been organised on word processing, spreadsheets, databases and Internet uses, for parents at Bromfords School, for example. A pupil contract is being established, based upon the one on the National Association of Co-ordinators and Teachers of IT (ACITT) home page, to detail responsibilities when using Internet access at school and at home. Contact has been created also with past pupils who are now pupils at university.

Further training and support

3.35 It is known that some parents provide Internet access for pupils at home. Pupils reported via questionnaires on the support they received from parents at home.

More pupils (28 out of 539) reported having help from their parents at home than those who reported no help (18 in number).

Maintaining equipment

3.36 Technological problems have been encountered by schools. Companies have responded to problems as they have arisen, but schools have been responsible for maintaining their equipment and provision. One school has internal support from an IT technician, but has not encountered problems to any extent. A second school has internal support from an IT technician, and has also called upon sponsor companies for support when problems have arisen. The third school has no internal IT technician, but uses the expertise of a member of teaching staff. In this case, when problems have arisen, the school has relied upon the support of sponsors.

Implementation at classroom level

Raised standards, value-added and improved quality of work

3.37 This section is written using evidence gathered by a qualified OFSTED inspector, using the OFSTED framework, from direct classroom observation, analysis of a wide sample of pupil work, interviews with eight teachers and a range of pupils, observation of a lunch-time club, and analysis of club records in one of the project schools.

3.38 The system within the school has been used to support the teaching and learning of science, history, geography, technology, English, and pupils' independent studies. Evidence indicates that:

- The Information Superhighway was perceived by all teachers as providing for the books that they do not have on their library shelves. The history teacher was delighted to have access to material that was written from another political standpoint, and had some useful examples of articles to support the teaching of Study Unit 2 in history.
- Information identified by teachers as being useful was relevant to the National Curriculum Programmes of Study at the appropriate key stages. Some useful data had been collected in relation to geographical thematic studies at national, international and global scales.
- Teachers report improved quality of work, especially with less-able and more-able pupils. For the less-able pupils, there was less frustration, although one teacher reported that the language used on the Internet was often too difficult for them. For the more-able pupils, the project was useful for extending individual lines of enquiry. One teacher suggested that the resource was used as a 'bribe' for the disaffected learner.
- Pupils reported that they felt more empowered during lessons when they were using the technology.
- Material integrated into work observed to date indicates it is used simply in ways to recall facts, and to group facts, but is used in ways less concerned with an evaluation of facts.
- All teachers using the resource reported increased motivation of pupils.
- All teachers and pupils commented on the time it takes to find relevant material. Two teachers mentioned that they had experienced lessons when no useful information had been gathered.

- The technology teacher, a confident user, suggested that care was needed to ensure a balance between giving pupils pre-designed ideas, and encouraging them to use different search tools.
- One teacher reported that homework was enhanced greatly when pupils had Internet access at home.
- Only one teacher felt that their teaching style was changing with their involvement in the project. They felt that this was due to the increase in individualised work, and the effect that this had on their role as a teacher. The teacher felt that there was a need, as a consequence, for more initial planning, and a greater emphasis on the development of learning skills and IT capability. This was a concern to the teacher as a teacher of history.
- A history teacher suggested the need to write IT use into the history scheme of work.
- The majority of teachers found the organisation of the working base in the library restricting. One teacher suggested that six or seven pupils was ideally the maximum number of pupils to supervise in the resource area.
- All teachers had ideas about the potential of the system, but many felt they lacked the technical ability to support developments such as sharing work with other schools on the Internet.
- Observations of the lunch-time club revealed that many pupils were gaining access to material that was not directly related to further study arising from classroom activities. Although the booking sheet asked pupils to fill in their purpose for use of the resource, none was filled in.
- Records of pupils attending the club revealed that 80% were male pupils.
- There are no home links yet established.

3.39 There is some evidence to suggest that standards have been raised in some aspects of all subjects involved in the project. Some teachers suggest this is particularly the case for the more- and less-able pupils.

3.40 There are four factors that contribute to pupils attaining high levels for their abilities:

- The systematic teaching of information skills linked to the new technology means that pupils are taught to use the traditional library resources in conjunction with CD-ROMs, the Internet and word-processing programs. This is effective in supporting pupils in operating IT, and for the less-able pupils provides a structure for retrieving information from a pre-existing database on disk or CD-ROM. The present programme is less effective in encouraging the more-able pupils to exercise skill and judgement in presentation and analysis of information at the beginning of Key Stage 3.
- The quality of data available to support geography and science is good. In geography and science the data are real, relevant to programmes of study and up-to-date. This gives the work a sense of purpose and often encourages pupils to enquire further.

- Information on CD-ROM and the Internet extends the range of material available. As one teacher stated, 'this makes up for the books we don't have on the shelves'. This was particularly helpful when pupils were studying Ireland, in Study Unit 2 National Curriculum History, as a topic and material written from an Irish perspective was available. The teacher had collected useful articles and, although some of the language was difficult for the pupils with poor reading skills, they were encouraged to offer explanations and analyse relationships between features of past societies.

- For those pupils who had Internet access at home, research undertaken as homework was much enhanced, with pupils providing a greater breadth of information.

3.41 In all lessons observed, there is evidence of pupils gaining new information-handling skills. Pupils are effectively taught how to locate information through the RM Pathways Topic Index and the search engines available. All teachers recognised the importance of developing skills to support learning and IT-handling skills, and questions were raised about who should be responsible for ensuring these skills were taught.

3.42 The majority of teachers found the library restricting as a working base. There were several reasons for this. Generally, the entire base is booked for a session and the whole class is taken to the library. The organisation of the hardware, with screens back to back makes it difficult to supervise what the pupils are viewing.

3.43 All teachers and pupils commented on the time it takes to find appropriate material on the system. In some lessons, the pace of learning was adversely affected due to the time taken to find relevant material.

3.44 Key issues emerging from these observations are:

- the Information Superhighway enhances curriculum provision and is perceived as providing the books that the school does not have

- homework is reported as being enhanced when pupils have access to the Internet at home

- lower- and higher-ability pupils have greater access to Internet resources; this raises equality of opportunity issues for the middle-band pupils

- there is a reported increase in pupil motivation to learning when access was given during lesson-time

- there is a need for teachers and the school to consider and develop the balance between pre-designed pathways and the use of search tools

- there is a need for teachers and the school to consider how to manage an appropriate balance of teaching and research time

- there is a need to develop a more systematic way of teaching generic learning skills

- there is a need to consider the management and organisation of groups and the role of adult support

- teachers recognise the potential of the system, but do not feel that they have the technical expertise to pursue it

- there is a need to consider how to develop a closer co-operation between the IT department and other departments
- the monitoring of use during extra-curricular time
- ensuring the involvement of female pupils during extra-curricular time.

3.45 As can happen with projects of this nature, some technical problems have been reported that have created some frustration. However, the enthusiasm of the teachers, support staff and pupils interviewed remains high. Future projects involving use of the system are being planned with vigour. Teachers recognise the potential of the system but require technical support and time to explore and plan for development so that issues of teaching and learning are addressed. Teachers are moving away from simply concerning themselves with finding something to do with computers. They are already discussing the implications of the technology in terms of developing more systematic ways of teaching generic learning skills and the need for closer co-operation between the IT department and other departments.

Evidence of increased motivation

3.46 Pupils from one school have reported via questionnaires on their perceptions of increased understanding and motivation arising from use of the Internet. Many pupils, 189 out of 539, reported that the use of the Internet was helping their understanding of certain things, while 140 indicated it was not helping.

3.47 Many pupils (169 out of 539) reported that they felt more in control of their own learning as a result of the use of the Internet, and many reported that they felt that they could organise their work better (98 out of 539).

3.48 Pupils were roughly equally divided in their views on whether the use of Internet would help to support their interest both with regard to school subjects (143 reported positively, 148 not) and with regard to learning generally (154 reported positively, 136 not).

Productivity gains

3.49 Teachers reported via questionnaires on whether the use of Internet was helping to save them time. Eight teachers reported that the Internet has not helped to save them time at this stage, but an equal number of teachers indicated that time has been saved, at least to some extent.

3.50 Pupils reported on how the Internet was providing them with additional or other opportunities for learning. Some pupils reported learning benefits from the use of the Internet in supporting their learning in different ways (95 out of 539), in different places (91 out of 539), at different times (88 out of 539), and specifically at home (69 out of 539). Larger numbers reported that this is not the case, but those who are gaining these opportunities appear from teacher reports to be benefiting positively.

3.51 Home use of the Internet by pupils is reported as mainly helping contacts with other pupils and others (87 out of 539), but about 10 reported contact with parents being supported and another 10 reported contact with teachers. This is perhaps a significant number when it is considered that there is currently no specific school policy to develop this link.

3.52 While most pupils reported that the use of Internet had not helped to develop links, there were a large number of those who had Internet access at home as well as at school who had felt that the Internet had developed links between home and school

(24 in number), between school and home (33 in number), and with other persons (49 in number).

3.53 Teacher reports of pupil abilities to undertake learning in different ways, in different places, and at different times, match those of reports from pupils. Teachers reported on their perceptions of the linking provided. Teacher reports of the extent to which Internet has helped to link schools, homes and the wider community supports the perceptions reported by pupils.

Learners with special educational needs

3.54 Teachers from Bromfords School reported on their use of the Internet with pupils with special educational needs. Only two teachers from 17 replying reported using Internet with pupils with special educational needs (seven reported no use). However, as evidenced in an earlier section (see paragraphs 3.38–3.40), teachers are finding that pupils with special educational needs can gain particularly from use of the resources available via communication technologies.

Development of information-handling skills

3.55 Pupil development of information-handling skills in Invicta Grammar School is developed through Internet search skills sessions run by one teacher. Year 7 pupils received IT lessons during the 1995–96 school year, and Year 9 pupils received one lesson, about 75 minutes long, once a fortnight, in the 1996–97 school year. These are not structured IT lessons, but are done within Personal and Social Education (PSE) lessons. Teaching of particular pupil IT skills is requested by school staff widely.

3.56 Bromfords School is integrating skills needed by pupils to use the Internet effectively into its existing course for information skills. The Information Skills course in Year 7 is for new starters, to teach them location skills and about types of material and contents of the resources available. In Year 7, the Internet skills being developed teach how to move through a given pathway, so that pupils can become familiar with use of the technology. Once they can use 'go to Home Page', they will be given practice in selection skills, with teacher direction, which will encourage them to think about why they are making selections. In Year 8, the skills concentrate upon note taking, listening, study skills and finding information.

3.57 The IT skills being encouraged during this development are:

- learning to read instructions
- keyboard skills, although not solely for Internet or CD-ROM use
- mouse skills
- visual skills when using Netsearch, for example in identifying features of advertisements that indicate potentially useful sources
- language skills, particularly with regard to American terms
- selecting information
- taking notes from the screen.

When audio is available, listening skills are also needed.

3.58 Pupils reported via questionnaire on whether they had found useful resources on the Internet. Most (333 out of 539) reported that they have found information which they consider to be useful (76 reported not). Pupils reported on their abilities to

download and store information. About half of the pupils (214 out of 539) reporting indicated that they had downloaded and stored information from the Internet (180 reported not).

3.59 Pupils reported a similar pattern of use of information to that reported by teachers. Most uses reported are for research (216 out of 539), answering specific questions (142 out of 539) and background information (139 out of 539). However, homework use appears to be used more than might be expected from teacher reports (124 out of 539 reporting this).

3.60 Most pupils indicated that they used certain keywords to identify material (199 out of 539), but many used guidance from others (142 out of 539), and about one-seventh used chance as a means to find material.

Fundamental new skills

3.61 Teachers reported via questionnaires on their perceptions of changed practice. Seven out of 10 teachers reporting indicated that they believe that they are now working in different ways as a result of using the Internet.

3.62 Few teachers reported administrative and management use of the Internet at home at this stage. Two teachers reported use for lesson planning, one for school or class administration, and one for linking home and school records.

How information was used

3.63 Most teachers reported that Internet resources fit with curriculum needs averagely well or better (eight out of 17); two indicated that the fit is inadequate. About half of the pupils (248 out of 539) indicated that they could readily relate Internet material to school work (136 reported not). Most pupil uses of Internet materials reported by teachers were for personal research (11 teachers reporting this), background information (nine teachers) and answering specific questions (seven teachers).

Access and equity issues

3.64 With regard to access to the Internet at home and at school, teachers reported via questionnaires on their access to Internet at home. About one-quarter of the teachers (four out of 17) reporting had access to Internet at home. Most pupils have used the Internet at school or at home (438 out of 539) but only about one-twelfth have access at home.

Implications for learners with special educational needs

3.65 While use of Internet resources has not been widely explored with pupils with special educational needs, ideas for specific applications are being considered. Some special cases for this potential development have already been identified at Bromfords School, a sixth-form pupil who was a non-integrator and a pupil with a brain tumour.

Gender issues

3.66 Teachers reported via questionnaires on their perceptions of the use of resources by girls and by boys. Teachers are divided in their views currently as to whether boys and girls use the Internet resources equally (five out of 10 reported ‘yes’, and five reported ‘no’).

3.67 In Invicta Grammar School, the project manager indicated that, being a girls’ school, there is less need to have technical expertise available. Generally teachers feel they can rely upon pupil responsibility, and can trust pupils.

3.68 It seems that computer clubs may well attract more boys than girls. It is suggested that girls use Internet for focused use, and tend not to use it for browsing so much. Boys tend to browse more than girls, and identify this as a 'fun' activity.

Services and applications

Frequency and type of use of facilities, and usage times, on and off line

3.69 Teachers reported via questionnaires on their frequency of use of the Internet at home. Some report using it almost every day, while others report using it very infrequently. Teachers reported that they accessed the Internet at home at weekends, after school, during the evenings, and during holiday times. Teachers reported that, when they accessed the Internet, most used it for less than an hour. Some indicated that they accessed it for just a few minutes on each occasion, while some indicated that it was about an hour or more.

3.70 Most pupils reported having accessed the Internet at home once or twice only (28 pupils), but many report higher levels of access (16 pupils). Access times are distributed roughly equally across the periods of time available to pupils at home, evenings, weekends, after school and during holiday times. Most pupils access the Internet at home for between about half an hour to 2 hours on each occasion (48 pupils reporting). A few pupils access it for shorter (six pupils) or for longer times (two pupils).

Access for learners

3.71 Pupils reported via questionnaires on ease of access to the Internet at school. Most pupils reported that the Internet is at least reasonably accessible in school (315 out of 539). About one-fifth reported that it is difficult to access. Many report using the Internet once or twice in lessons (219 pupils); fewer indicate using it more than this (136 pupils).

User friendliness

3.72 Pupils reported via questionnaires on the ease of use of the Internet. About two-thirds (342 in number) indicated that the Internet is easy to use in school, and that it is easy to use the information provided (350 in number). About two-thirds of the pupils (306 out of 539) reported having used the Internet to view things other than those identified by the teacher (111 reported not). Pupils reported on whether they had managed to find things on the Internet. Most pupils (318 out of 539) reported that they could search and find materials they wanted on the Internet (88 reported not).

Cost issues

3.73 The cable broadband network and regional CD-ROM server in the Superhighways in Education Project utilise standard technology, although the CD-ROM server is unusual in the UK, at a medium range pricing. Standard PCs used are those that any school could consider, although the pricing of Internet on-line access is as yet unclear. Major costs are implied for physical networking of the school, and adequate funds should be budgeted for on-line connection and usage costs incurred, for training and for maintenance.

Aims and outcomes

3.74 Within the Project Implementation Proforma, it was stated that 'learners will use wide area network information resources such as multimedia servers, for use researching project and assignment work'. The stated aims of the project were 'to understand the likely eventual practicality and usefulness of educational systems developed using experimental broadband technology combined with existing school

networks'. The central aim of the project was to consider the use of remote CD-ROM access and Internet access by secondary schools. So far, the use of remote CD-ROMs has been successfully considered, and while there has been an overall lack of use widely in the schools, some sponsors are still actively considering the possibilities of providing access to remote CD-ROMs.

3.75 The models of development within this project have relied upon levels of involvement at a local school level. Decisions about potential have been taken within the individual schools, and degrees of involvement from external partners have been focused within the school. The involvement of internal school personnel is likely to determine the extent of overall development, but the use of the resources within the school, so long as sufficient resources of high quality are available, would appear to be sustainable in educational terms for the schools.