


Education Departments' Superhighways Initiative

Group B: Vocationally-Focused Projects

Final Report

Computer Based Learning Unit School of Education
The University of Leeds

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Evaluation Methodology and Procedures

1. The evaluation procedures for the projects in Group B necessarily varied according to the context of individual projects, however the following general methodology was employed for all projects.

2. All educational institutions involved in the ten projects were visited by members of the evaluation team, though where a large number of institutions was involved (e.g. London Colleges Multimedia Initiative) a large representative sample was visited.

3. Data was obtained through the use of observation of teaching and learning, through semi-structured interviews with participants at all levels, and through the use of questionnaires using fixed and open-ended response items. Emphasis was placed on eliciting and representing the views of a range of those involved in each project, from learners to teachers and managers.

4. In addition, the evaluation teams analysed project documentation, students' work and minutes of management meetings and, where possible, a member of the team attended project management and steering group meetings.

5. Regular evaluation team meetings were held to ensure a commonality of approach and to inform and refine the methodology adopted and the evaluation foci as findings emerged.

8. HERTFORDSHIRE 'STUDENTS AS WRITERS' PROJECT

Project context and background

8.1 The initial 'Students as Writers' Project began in May 1995 when schools within the Authority were invited to take part in a year-long project which was jointly funded by the LEA and British Telecom (BT). Bids were to include the schools' reasons for wishing to participate in the project and the types of investigation they would wish to undertake. In all, 14 schools made successful bids and obtained funding.

8.2 At the end of the year-long project, four schools continued to receive funding from BT, and these four schools form the focus of this evaluation. The four schools were provided with ISDN2 lines and an Internet connection to Campus World, the wide-ranging educational Internet resource provided by BT. The schools involved are two primaries, Chaulden School and Northgate School, and two secondary comprehensives, John F. Kennedy High School and St Albans Girls School.

8.3 The initial project changed somewhat in the summer of 1996 when the original funding from Hertfordshire Education Services ended. However, the four schools continued to be supported by BT, their brief now being to develop pupils' work for publication on the World Wide Web.

8.4 The focus of this evaluation concerns the work which began in the schools in September 1996 and is due to continue at least until 1998.

Project aims

8.5 Although the aims of the project vary slightly from school to school, as part of the understanding with BT, the four schools are expected to:

- publish children's work on the World Wide Web (WWW)
- develop curriculum materials which will be available to all schools.

8.6 Additionally, as the schools are members of the user-support group, they will also:

- investigate the WWW, discover interesting sites and send information to the Hertfordshire Education Services Curriculum Adviser who will create a catalogue of Internet resources from the children's findings
- develop helpful strategies to prevent children from having access to unsuitable material on Web sites.

Technical issues (hardware and connectivity)

8.7 Connectivity with the Internet has been through ISDN2 lines using BT Internet as the Internet provider, with telephone calls made to Birmingham for this service. It is important to appreciate that the project was initially based on the use of trial products which have now been replaced by fully-tested commercial products.

8.8 Each of the primary schools has had one PC with Internet access, but the secondary schools have attempted to establish network connectivity to the Internet through the use of their existing PC networks connected through routers to the ISDN2 lines.

Project evaluation

Management

8.9 The projects are directly overseen by the Curriculum Adviser of Hertfordshire Education Services. Project co-ordinators from the schools meet regularly twice per term with representatives of the LEA to discuss the progress of the project, suggest initiatives, share experiences and for staff development.

Project activities

8.10 In this section, we report on the project activities which have been undertaken in the individual schools and, particularly, on the curriculum applications of the Internet.

St Albans Girls School

8.11 The school, an 11-18 comprehensive with some 1,100 girls, is on the outskirts of St Albans, drawing most of its pupils from the city, but with significant numbers coming from surrounding areas. The school has an excellent reputation, with particularly good examination results. Many staff and pupils have access to a computer and the Internet at home.

8.12 The hardware used in this project has comprised 16 networked Pentium PCs with ISDN connection to the Internet. Whilst there is no open access for Years 7-11 to the Internet, sixth formers do have full access, but are supervised and logging on is carefully controlled. The school has an IT technician who works for 20 hours per week in the IT Area, supervising the network and maintaining the machines. The Head of IT sees her role as computer co-ordinator across school. She and the IT technician act as joint systems managers and carefully control access to the network.

Teaching and learning

8.13 Most of the work done by the Head of IT is with the Year 12 students to supplement their A-Level studies. The intended timetabled work with the lower school classes was abandoned because of late connection and system reliability. It is intended to use the superhighway facility with classes in the lower school when much higher reliability has been obtained.

8.14 However, there was an interesting 'one-off' activity which involved Year 8 pupils. As a result of a competition organised by the Royal Astronomical Society in 1996, three groups of pupils used the Internet to access information on the planet Neptune and, from their work, they compiled a number of mock newspapers purporting to have been composed on 16th October 1846 when the discovery of the planet was headline news.

8.15 In A Level Nuffield Physics, students are required to produce an assignment in which evidence must be given of the use of several different information sources. Many of the students have used the Internet as one of their sources for this assignment. Areas of the curriculum which are being investigated through the Internet comprise electronics, renewable sources of energy, absolute zero, satellite communications, surface water waves and water jumps.

8.16 It is the sixth form that is forging the way ahead in the use of the Internet to support the curriculum. Examples include History classes using data relating to the November 1996 US presidential election and Economics lessons enhanced by using current financial information. French students use a French search engine called Nomad to explore the WWW in French. Music students have explored the Internet for WWW sites to help with their A-Level Music

studies, especially related to the set historical topic of 'Opera between 1760 and 1830'. This has been particularly effective, as one student wrote:

"This home page enables you to search under epoch, form, composer, instrument and also includes a short history of Western music. You can find out about three important concepts – melody, harmony and rhythm – and read classical music pages quarterly with interesting articles about various musical topics."

8.17 There have been some e-mail links to Australia with Year 10 and 11 pupils, but again there have been problems with reliability and with the fact that Australian school terms do not match UK school terms. This causes problems in maintaining interest over a period of time, for example when the schools are on their respective long Summer vacations.

8.18 There has been contact with the school's German partner-exchange school in Worms and an exchange of e-mail will precede this year's exchange visits.

8.19 The St Albans Girls School has already produced a multimedia electronic brochure and it is intended that this will be kept up-to-date, translated into HTML format and then placed on the Internet to become the school's Home Page.

John F. Kennedy RC High School

8.20 The John F. Kennedy School is an RC Voluntary-Aided 11-18 comprehensive school with 900 pupils, including 150 in the sixth form. It is situated in the north-western suburban area of Hemel Hempstead.

8.21 The school has a strong IT tradition and recently bid successfully for BT sponsorship to become a BT Link school and, as a result, has been provided with funding to enable seven members of staff to borrow a Pentium PC and modem to use at home for the purpose of exploring the Internet. These members of staff, along with five others from the school who already had Internet access at home, are part of a project which is concerned with identifying curriculum applications of the Internet. Staff are able to research the Internet at home and download materials for inclusion in their lessons. Virgin Net is the Internet provider used in the project.

8.22 The school has standardised on the use of PCs and has nearly 60 networked 486 computers. In common with the other project schools, Internet connectivity is via BT Campus World over ISDN2 lines with a network access to 30 PCs.

Teaching and learning issues

8.23 Reliable connectivity has precluded several initiatives being undertaken. However, during those times when the school has had some connectivity, e-mail has been successfully used on several occasions, for example for links with schools in Australia, and for dialogue with a local feeder primary school, so that Year 6 pupils in the primary school can contact pupils already attending the secondary school and gain some familiarity with the school and its customs to make the transition from primary to secondary school as smooth as possible.

8.24 In the school's music department, there are two students who are interested in computing and music. With assistance from the Head of Music, they have designed the school's WWW page, which is strongly music-orientated and has a number of links to Musical Instrument Digital Interface (MIDI) files, many of which were composed by pupils at the school.

Comment

8.25 Despite all the setbacks and disappointments which have occurred during the project, the IT co-ordinator and many of her colleagues are very positive about the potential use of the superhighway as a curriculum resource. She commented, *"We would not be without Internet connectivity"*.

Chaulden Junior School

8.26 Chaulden Junior School is situated on the western edge of Hemel Hempstead. It caters for 194 pupils in the 7-11 age range. It has six mainstream classes and a small class with specialist speech-and-language provision for children in the western part of Hertfordshire, prior to the children being integrated into mainstream education. There are three classes which cater for Years 3 and 4, and three classes for Years 5 and 6. The school is very IT-aware, with both the headteacher and deputy head being IT-literate and enthusiastic about the uses of IT in schools.

8.27 Chaulden School is moving towards PC provision and, with help from the PTA, there is at least one multimedia PC in each classroom supplemented by some older (donated) PCs. The school has standardised on proprietary software, Key Solutions from Research Machines, which is used for accounts and maintaining a pupil database.

8.28 The school has three ISDN2 connection points; one in the Library, one in a classroom and one in the School Hall. The Internet is considered to be an invaluable resource and the school is prepared to find funding to continue with its use after BT funding ceases at the end of the current project.

Aims of the project at Chaulden School

8.29 When the school was invited to submit a bid to become a member of the Hertfordshire Internet in Schools Project in May 1995, it indicated the ways in which it would endeavour to enrich the curriculum through the use of the Internet. These were identified as:

- to provide opportunities to broaden children's understanding and knowledge through interfacing with people from other countries, cultures and backgrounds
- to broaden pupil and staff technical expertise in the field of IT
- to enable pupils and staff to access the enormous range of materials in the area of the arts, culture, language, and science, as well as databases and other resources such as weather maps, works of art and modern technology
- to enable pupils to develop research skills beyond those attainable with current resource materials
- to develop links with schools in other countries/localities
- to facilitate information flow between school and external agencies.

Teaching and learning

8.30 In spite of the technical difficulties encountered, when the system *has* been working there have been some innovative and exciting learning activities taking place.

8.31 The school took part in the TES Newspaper Day which was a very successful venture with the deputy headteacher's class managing to produce its paper by the following day. It was hoped that, in 1997, the whole school would take part in the Newspaper Day project, but this activity has had to be cancelled because of the unreliability of the connectivity to Campus World.

8.32 Other activities involved e-mailing a class in an Australian school and using the Internet to search for curriculum resources. The school has taught pupils how to access the Internet and use the search engines.

8.33 On National Poetry Day, children in the school submitted work to Campus World for inclusion in their SWIFT On-line Magazine.

8.34 The school has occasionally benefited from parents who have links with the IT industry. One such parent, who owns a database marketing company, has allowed pupils to contact staff at his firm via e-mail so that they may obtain some real-life examples of the applications of IT.

8.35 The school has developed a series of worksheets to introduce pupils in Years 5 and 6 to the Internet. Topics include The Tudors, The Mary Rose, Anne Frank, Isaac Newton, NASA, World War II, and Whales. Through the use of keywords and search engines, the children develop their skills of information retrieval and filtering. They are encouraged to bookmark suitable sites so that other children can benefit from their research.

Comment

8.36 The school has clear objectives for the use of technology and the information superhighway to enhance the children's learning. These are detailed in a comprehensive strategic-planning document. It is a major disappointment to the school that the many initiatives which were planned have not taken place because of technical difficulties, despite the efforts and enthusiasm of the staff at the school.

Northgate Junior Mixed and Infants School

8.37 Northgate School is situated to the north of Bishops Stortford and was founded over 160 years ago, though it is now accommodated in modern buildings with a new building extension programme due to start in 1997. The school caters for children from four to 11 years and has 270 on roll, plus 30 in the nursery class. It has a total of 12 staff, four of whom have their own computers at home. The school has an enviable record of using IT from which it has gained national recognition and is involved with the Parents Information Network (PIN).

8.38 The school has a wide variety of computers, ranging from BBCs used in the Infant school through to Archimedes and PCs, together with six Apple Macintosh computers which were donated to the school. The headteacher ultimately hopes to install a network in the school so that resources such as CD-ROMs and printers can be shared.

8.39 The school joined the Hertfordshire project in June 1995 and had its ISDN line installed in the Hall, with an RM 486 PC used to access the Internet.

Teaching and learning

8.40 The Hertfordshire 'Students as Writers' project is only one part of the school's multi-faceted IT strategy. During the evaluation visit, and as an indication of the varied IT activities which have taken place in the school, the following applications were demonstrated:

- Bones – a multimedia presentation developed by a former teacher and her class, produced in Magpie on the Archimedes
- Awesome Alphabet – the sequel to Bones, produced using the same software on the same platform, exploring the alphabet through pronunciation, together with a short spelling test
- Hyper-studio – a demonstration on the Apple Macintosh of a high-powered hypertext authoring package by a group of Year 6 pupils
- Greeks – a Magpie/Archimedes tutorial program produced by the school
- Newspaper – the production of a school newspaper by the pupils at the school
- an e-mail link with Australia – pupils who had used the Campus World e-mail system described their experiences in using the system, and the differences between school years and terms in the UK and Australia
- Internet – four pupils demonstrated their ability in accessing and navigating the Internet, and showed the work they had done under the supervision of a parent helper and their class teacher on the subject of 20th-century Art.

8.41 Northgate School recently mounted a 'Hands-on Computers!' exhibition with some 18 separate demonstrations of the ways in which IT is used in the school. An interesting feature of the exhibition was that each of the demonstrations was being given by a parent helper. The purpose of the demonstration was to attract more parents and grandparents into the school to help the children in using the wide array of IT facilities which are available. Amongst the items demonstrated were:

- Art on the Internet (on a laptop)
- Encarta multimedia encyclopaedia
- Computer art – painting on screen
- Word processing
- Exploring the Internet
- Aspects of Religion on CD-ROM (on a laptop)
- Spreadsheets (Excel)
- Encyclopaedia and the Ultimate Human Body on CD-ROM
- The World of the Vikings on CD-ROM
- The National Gallery on CD-ROM
- Creating your own multimedia with Hyper-studio
- Animals in Art on CD-ROM
- How to make multimedia – NEMA CD-ROM
- Make your own multimedia with Magpie

- Learn to touch-type!
- Bones and Awesome Alphabet on CD-ROM
- Try out a palmtop computer
- Tell a floor robot where to go!

8.42 The number of parents and grandparents attending had been limited to 40, so there was ample time and opportunity for all to try each of the activities. The idea of inviting parents into schools, particularly junior schools, is not a new one but the Northgate model adds two novel dimensions:

(i) The involvement of grandparents

8.43 Grandparents have more than just a passing interest in the education of their grandchildren and have often assisted in the development of useful educational skills, such as reading. The headteacher's thesis is that, with more people retiring early, it is timely and beneficial to involve grandparents as helpers in the school.

(ii) Skill acquisition

8.44 Many of the helpers coming into Northgate School have computer skills. However, in return for their help in assisting the children, the school offers them the opportunity to acquire new skills which they can then further develop. One of the major features of the system is the building of the helpers' confidence. A case in point was that of a child's grandmother who was a 'dinner lady' and had never used a computer before. She expressed an interest in becoming a helper and, after a tentative start, is now the school expert in using CD-ROMs (especially Aspects of Religion). Other helpers have developed expertise in the use of the Internet, since it is school policy that children using the Internet are supervised at all times by an adult.

8.45 The use of parent helpers is a significant feature of the whole school organisation, and particularly in IT. The Internet facility is located in the school hall and, hence, when its use is required, pupils have to be withdrawn from a class and supervision provided whilst they are accessing the Internet. Without the use of parent IT helpers, this would place an organisational difficulty on the class teacher. The problem is now avoided, since the class teacher can remain assured that any pupils sent to access the Internet for information are under the supervision of a parent helper who is fully conversant with using this resource.

Comment

8.46 The Northgate model may not be applicable everywhere, but it is certainly an interesting one which could well prove useful elsewhere. However, it is only peripherally related to the Superhighways project. On the other hand, it is interesting to see the information superhighway being regarded as another IT resource to enhance the children's learning, rather than as a separate entity. The primary school philosophy of using all available resources as whole-school resources which are freely available to all children as required is an attractive one which has paid dividends at this school.

Overall technical issues (external connectivity, networks and equipment)

8.47 It is unfortunate that repeated problems concerned with maintaining a reliable connectivity to BT Campus World have militated against many of the expected developments in this project.

8.48 Some of the technical difficulties appear to stem from the use of a trial system by BT which was set up in September 1996, and the later transfer of users to a more reliable system, which resulted in the previous Internet Protocol (IP) addresses not being recognised by the newer system. It should be noted that ISDN access is not generally available on this Internet service, so this was part of a technological trial. It is hoped that, now the problems have been identified, a greater reliability may ensue. It is noted that all schools have suffered from connectivity problems, but these have chiefly occurred at the two secondary schools and Chaulden Primary School.

8.49 Whilst the connectivity that has been established has resulted in significant usage at the schools, the problems which have arisen, and the customisation of particular systems have placed obstacles which have often precluded initiatives being undertaken.

Technical and pedagogical support

8.50 Technical support is provided by BT Campus World and the LEA. Having two organisations providing support has occasionally led to problems over isolating possible areas of failure or trouble, and then allocating responsibility for the successful resolution of the repair. Whilst the Campus World Helpline has been sympathetic to the difficulties encountered by the schools, it is only recently that this has become effective in terms of solving their problems. Schools generally do not possess staff with appropriate technical skills to resolve the problems which are often encountered with the use of such technology, particularly when this involves LANs, and it is important for quick resolution that technical support is readily available.

8.51 Pedagogical support is provided chiefly through the regular meetings (twice per term) which are held for the school co-ordinators in the project, a newly-formed Internet User Group and the distribution of a newsletter by Hertfordshire IT Services. The newsletter is particularly informative, with many classroom applications of IT, which, in turn, help with the dissemination of ideas and expertise.

Staff development

8.52 Hertfordshire Education Services has provided two training days for the project co-ordinators. These involved an introduction to the Internet and the WWW, the use of search engines, downloading of information and the use of e-mail. In March 1997, further training was given for the co-ordinators on publishing on the WWW. Additional training (for IT staff) is provided on an ad-hoc basis as and when new software is installed at a school, for example HTML support training was given to all schools during February 1997.

8.53 Some schools have also been involved in developing their own programme of staff development targeted on specific curriculum areas, for example St Albans Girls School has run a half-day INSET course on the use of the Internet with Modern Languages staff, whereas other schools have delayed the start of their internal INSET programme until a more reliable connectivity is assured.

Project finance

8.54 The ISDN line installation and running costs for the project have been met by BT.

8.55 It is estimated, on information supplied by St Albans Girls School and Northgate School, that the running costs (that is telephone-connect charges and ISDN line rental) for the project per quarter would amount to between

£600 and £1,000 per school. However, since the project is sponsored by BT, there is no charge for these services made to the schools.

Progress and achievements

8.56 Measured by the project aims, the achievements have been modest and this is undoubtedly because of the poor connectivity which has been a feature of this project and which has severely restricted the initiatives which the schools wished to take. Nevertheless, progress has been made and this is indicated in the descriptions given previously, which show the many different curriculum applications which have occurred through the use of the Internet. Whilst the schools have not introduced any innovative teaching strategies, all the applications described have been integrated into the curriculum and do not appear as 'bolt-on' exercises. The pupils have demonstrated their own competencies at accessing the information databases which the Internet has provided. Generally, the teaching and learning has emphasised the use of the Internet as an information resource. Two schools, John F. Kennedy and Northgate, have WWW sites, and work is in progress at the remaining schools towards achieving this aim.

Commentary and recommendations

8.57 This is a well-cast project with clear, realisable aims whose outcomes would benefit many schools. Although the project is still in its early stages, it provides an insight into how an IT resource, such as the Internet, can be integrated into the curriculum of a school.

8.58 Unfortunately, it has been affected by connectivity problems which have restricted the many initiatives which were originally envisaged. The support services provided by both BT and the LEA have not been fully effective in overcoming the difficulties which have arisen and, whilst one may expect teething troubles with applications of the new technology, institutions involved in a project should expect appropriate levels of support to be provided. It is the responsibility of the sponsors and management to ensure that this occurs. If technology is to be used in the classroom its reliability must be assured.

8.59 The pedagogic support, by way of contrast, has been effective. The mechanisms for dissemination, through user-group meetings and the admirable newsletter, are ones which should be copied by other projects and they have led to many of the developments which have taken place. The dissemination process is also helped by having proactive IT representatives on the senior management teams of the schools and it was noted how effective this had been at Northgate JMI School, where the headteacher had taken on this responsibility, supported by the Chair of Governors.

8.60 There have been no reported difficulties over integrating the use of the Internet within the existing curriculum of the schools. The secondary schools were fortunate in that, when connectivity was present, they could consider small- or large-group activities. By contrast, the primary schools always had to adopt lesson strategies related to withdrawal of pupils or small-group access. When the IT facilities are located in a classroom, this does not cause problems, since the pupils may access the Internet during a circus of activities. However, it may cause disruption when pupils from other classes wish to use the computer and there is a steady stream of pupils coming into and going out of a room in which a lesson is taking place. To improve accessibility, Northgate JMI School placed its Internet PC in the school hall and, whilst this avoided the problems of restricted access, it brought with it the added difficulty of supervision. However, the school resolved this problem by use of their parent IT helpers, who supervised pupils using the Internet. Having adult helpers

recruited from the parents is not new in primary schools, but it has been extended considerably at Northgate JMI, where a total of 25 IT helpers are used to assist pupils in their IT work, no doubt strengthening the home-school links quite significantly and, at the same time, providing these parents with IT training which, as well as developing their personal IT skills, has also increased their self-confidence.

8.61 The running costs for the project, identified at two of the schools as between £600 and £1,000 per quarter, are quite considerable for any school to justify, unless there are measurable curriculum gains. It would appear that such costs are high when compared with other similar projects (see Report B2.2). This is possibly because of the telephone bills incurred through connections to Birmingham, an indication of the amount of usage or the slowness of the connectivity. One can only hope that a more realistic access and pricing structure will be used to enable schools in the future to take advantage of this valuable curriculum resource.

8.62 The project management style, when compared to other management models seen in the course of the Group B evaluation, permits the schools a significant degree of freedom to develop their own initiatives whilst, at the same time, providing oversight, monitoring and dissemination, together with a measure of staff development. This has largely been successful and schools have generally benefited from this freedom, thanks to the enthusiasm of the staff concerned who have moved the project forward, despite the connectivity difficulties which have been encountered. Where the management approach has been less successful is in resolving the difficulties which have occurred, particularly in bringing pressure to bear on the sponsor so that priorities are given to alleviate the constantly-occurring connectivity issues. It is to be hoped that a recently-introduced mechanism, whereby technical support will be the sole responsibility of the LEA, will prove effective.

8.63 The different curriculum applications detailed earlier in the report are indicative of the work which has developed in the course of this project. The work in all the schools is very encouraging and, in the primary schools, it has shown how the technology can be mastered by very young pupils. In brief, although the project is still in its early stages, the indications are that it will become successful once the technical problems have been eradicated. This is evidenced by some very commendable examples of what can be achieved in the use of the Internet in the curriculum of our schools.