Education Departments' Superhighways Initiative

Group D: Home–School Links

Final Report

Lancaster University Evaluation Group

Don Passey, Kathryn Forsyth, David Hutchison, Andrew Scott, Nigel Williams

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:

  Team leader

  Don Passey, *STAC Project, Department of Psychology*

  Research team

  Kathryn Forsyth, *In-Service Department, University College of St Martin's (Quality of Educational Outcomes)*

  David Hutchison, *Computing Department (Technological Issues)*

  Don Passey, *Department of Psychology (Educational and Social Issues)*

  Andrew Scott, *Computing Department (Technological Issues)*

  Nigel Williams, *Director Childnet (Resource Management and Cost Effectiveness Issues)*

  Consultancy group

  Jim Donnelly, *Headteacher, Litherland High School, SHA IT Spokesperson*

  Lynette Gribble, *Director, Open School*

  Paul Manning, *Independent Editor in Educational Technology*

  Steve Ratcliffe, *IT Co-ordinator, Queen's Park High School, Blackburn*

  Mike Treadaway, *Adviser/Inspector, Vale of Glamorgan Authority*

  Administration

  Shealagh Whytock, *STAC Project, Department of Psychology*

Acknowledgements

Section 2

Project Information

1.   ACORN HOME–SCHOOL LINKS PROJECT

Description of project

1.1   A number of past initiatives and ideas have been pulled together in order to form the elements of this project. The project has been an exploratory one. The Cambridgeshire Interactive TV (CiTV) trial, managed by Online Media (now Acorn Online), involves some 100 sites, including 92 homes, which are given access to a range of facilities such as Internet, a range of TV and radio programmes, educational software programs, and commercial and retail services. This project is a subset of the already established CiTV trial; it focused on the 10 schools in the trial, all of which had access to the same range of on-line facilities, with one school providing a large authoring provision. The evaluation has also looked at data from homes, including the 33 homes with school-aged children. Originally set up to test the technology within an educational context, the objectives of the educational trial have changed since its original inception, from a trial looking at use of resources provided, towards a trial focusing more on authoring provision for educational uses. While educational provision and linking was a part of this partnership, the managing agents never intended to put specific resources from the trial into educational provision. Educational uses were, therefore, entirely opportunistic.

1.2   The Acorn Home–School Links Project has been a company-led project. The technological trial was used for commercial trials of a range of resources, involving an education–industry partnership. The development of human networks of those involved as providers and users has not been a major focus for the project. Upon a sophisticated physical network, a range of resources have been provided that schools have been able to access. Schools were not a party to the selection of these resources, and the uses made of these resources within schools may therefore have been limited by this and other actions. Both homes and schools have been linked on the network, but any linking or use between homes and schools has been entirely coincidental.

Sponsors and other involved parties with a level of sponsorship

1.3   The Cambridgeshire trial was established in 1994, run by a subsidiary of Acorn, Online Media. Partners in the venture were Cambridge Cable, ATM, Anglia TV and ITN. More recently, SJ Research and ICL became partners. ICL provided a large server for the network within the main Acorn Online building, and SJ Research provided the switch boxes to enable signals to be relayed from one section of network to another, housed in boxes located on the roadside. The partners have provided a network infrastructure that allows users to access TV programmes on demand using set-top boxes (STBs) (see paragraph 1.8).

Services provided

1.4   The facilities are made available through three servers located in the Acorn Online building in Cambridge, offering a video-on-demand (VOD) facility. The interactive services are:

- TV and radio programmes

- commercial services such as shopping and banking

- some specific educational and software resources

- Internet access.

The schools' facility is only one of several in the trial, although the largest in terms of multimedia material prepared and provided thus far. A well-developed body of material has been digitised and stored on the servers at Acorn Online.

1.5   The programmes are provided by 'nursery' providers. These have included Anglia Multimedia, the BBC and Channel 4 for TV programmes, Acorn and Microsoft for educational programs, and Tesco and National Westminster Bank for commercial programmes. Currently, the service is available at no charge to the trial sites. At different times during the trial, different ranges of programmes have become available. For example, it was clarified in October 1996 that the BBC, who had had a range of mainly radio programmes on the trial previously, would withdraw from the trial. Channel 4 agreed at the same time to place material on the trial, with TV programmes such as *Art Adventures*, *Ancient Egypt* and *Ancient Greece.*

1.6   The user can access a hierarchical and structured menu in order to select the programmes required. The educational section, called Acorn Education Online, provides a menu that is categorised roughly by age: Earlybird (for pre-school), Kids Online (for primary), In-Class (for secondary), Daily Parent (for parents), Expansions (for adult learners) and Contributors (a section giving details about some of the 'nursery' providers). Provision is available for software to be downloaded and used on an ordinary TV with a STB, using a specific infra-red control panel. In theory, the software could be downloaded to a connected PC.

1.7   The central site and one school and one college site have advanced authoring functionality. This authoring capability can supplement the programmes and resources provided by 'nursery' participants.

Technical matters

1.8   The home and school users access programmes through the Cambridge Cable system. This system has a sophisticated cable enabling a transfer of data in either direction, called asynchronous transfer mode (ATM). To enable this system to operate, SJ switches are used at the road-side, so that access of data can occur in either direction through existing coaxial cables, in both analogue and digital form to school and home sites. The home and school user has a normal TV, but is equipped with a STB. This box enables signals to run to the TV, but can also send signals down the cable system to the Acorn Online facility, where programmes are held in a VOD form. To enable the video to run through the cable system, the resources are changed into a suitable form, termed Moving Pictures Expert Group (MPEG) encoding. The STB is essentially a low-cost but powerful computer, based on Acorn Reduced Instruction Set Computers (RISC) technology, having a number of possible network connections, which can be used in conjunction with a domestic television set or computer monitor to play out multimedia information and receive commands via an infra-red (IR) remote control unit. The STB sends coded signals to the VOD facility, so that access is given to the required programme chosen. Consequently, users can choose from a menu of programmes, which are then made almost instantaneously available on demand.

External connectivity

1.9   The physical network linking the project sites, a cable TV network using ATM technology, is arranged in a hierarchical structure that enables transfer of data running between 155 Mbps and 2 Mbps. Each STB is networked at either 100 or 155 Mbps, using the ATM network deployed across the Cambridge area, and linked to the powerful server computers at Acorn Online that act as multimedia information providers. Thus the STB provides an interactive, networked multimedia capability. The system supports end-user Acorn equipment and standard PCs.

Institutions involved

1.10   The CiTV project originally linked an iTV system to 100 sites; eight primary schools (one of which later withdrew due to a priority to prepare for an OFSTED inspection) and 92 homes. There was no formal connection made or created between the home and school sites for this project. Recently, more sites have been connected to the system, which have included two secondary schools.

1.11   From data provided by the project manager at Acorn Online, there are, from the 92 homes on the trial, 33 households with children aged between 4 and 18 years. Most households have two children present, but others have one child, and a few have three or four children.

1.12   All schools involved in the trial are within the boundary of the city of Cambridge, and all are within Cambridgeshire Local Education Authority (LEA).

Arbury Primary School (School A)

1.13   There are 270 children in the school, aged 5–11 years. There are 11 staff, and two teachers in the special needs unit. The pupils within the school are considered to come from home backgrounds where there is likely to be a TV and video in the bedroom, but no encyclopaedia within the house. There is at least one Acorn computer in each classroom in the school. There are two iTV systems in the school.

St Andrew's Primary School (School B)

1.14   The school has 320 children, aged 5ñ11 years, and 37 staff, including learning support assistants. The headteacher has indicated that children within the school come from home environments that tend to be TV-orientated. Each classroom has a computer, but use is carefully monitored. The school currently has only one TV, and the iTV system is used by moving the screen in and out of a location in school, to enable groups to access it during breaks, lunch-times, and occasionally in lesson-time.

St Matthew's Primary School (School C)

1.15   There are 360 children in the school, aged 5–11 years, and 15 staff. Within the school, the main access to the iTV has been in the library, as a part of the central school information resource for finding information. This location has been found to be entirely suitable. There is another access point in the hall that has not been used. About half of the staff are reported as having used the system.

St Luke's Primary School (School D)

1.16   There are 270 children in the school, aged 5–11 years. There are four infant and five junior classes currently, with distinct areas within the school for infant, lower junior and upper junior classes. The school is multicultural in many respects, there being approximately one-third bilingual children in the school at any one time. The ethos within the school encourages active listening, and considers sensory needs

and sensory-based activities for children. The school has a great deal of visual material displayed, including some work produced using an IT medium. The school has a central resources area that has the only access point for the iTV system.

Shirley Infant School (School E)

1.17   The school has some 360 children aged 5–7 years, and a 52-place nursery. There are four reception classes, three Year 1, and four Year 2 classes. The catchment area for the school is described by the headteacher as being mixed, tending towards a lower middle class bias, with the school taking more and more children with poor language skills. The two sets of iTV equipment in the school are placed in different locations, one in a small room that acts as a library, and the other in the hall. Technology generally forms an integral part of school life. The parents have provided two computers for the school through the Tesco scheme. There is now a computer in each classroom, and pupils regularly word process, use reading and mathematics programs, and data-handling packages.

Newnham Croft Primary School (School F)

1.18   The school has some 240 pupils, aged 5–11 years, and it is recognised that the catchment for the school is from mainly middle-class areas. There are carefully arranged displays in the entrance area, with pupil work integrated with other display material. The cable access in the school originally ran to the hall and the library. The latter access point has now been moved to the corridor. The school generally uses IT equipment with all age groups, and has a 4-year plan for the purchase of IT equipment. Currently, the school has two TVs and a video, and some video recording is undertaken in the medical room. The school has a computer in each room, and Year 2 have a bank of computers in a suite, which is being used on an experimental basis.

Milton Road Junior School (School G)

1.19   The school has some 230 children on roll, aged 7–11 years. There are 15 staff in the school. IT experience is limited to a very few staff; a teacher who started at the school in 1995 is considered by staff to be the most IT-literate member of staff, and has responsibility for the trial in the school. The connections to the school were provided in two locations: a connection in the staff room, which cannot be accessed by children; and a connection in the craft room, which is unsuitable, as it is not considered safe to keep the facility there. The teacher responsible for the trial in the school and another two teachers have explored to some extent the material available on the system. It is reported that the school does not use radio programmes a great deal, but teachers look for material that will provide visual stimulation.

Netherhall School (School H)

1.20   Netherhall School is a large comprehensive school on the outskirts of Cambridge, with some 1495 pupils, aged 11–18 years, and 92 staff. It is estimated that home access to the Internet might be at the level of 5–10% currently. The school has a mixed platform of equipment, including BBC, Acorn and Apple machines for curriculum use, and PC machines for the office and administrative system. All machines are on the same network backbone structure. As the result of a major recent rebuilding programme, the entire main building now has an fibre-optic network infrastructure. The new Design and Technology areas contain milling facilities that are planned to go on line, and the design and technology project room has an STB and TV that are not yet connected to the server facility in the IT room. This is also true of a similar facility within the Art room. A new suite of Apple machines is used by a range of subject areas. The network system in the school is now wired through to the biology laboratories, and new infra-red keyboard input will enable easier access in the future. Such a system will enable the downloading

of data from data-logging devices through IR controls on portable computers without the need for physical cable links, for example.

1.21   Internet linking is provided to the whole school via school Ethernet networks. The school has some 300 computers in total, which includes a functional room of BBC Compacts, used by the mathematics, science and geography departments, running some original Micro-Electronics Programme Computer-Assisted Learning (MEP CAL) programs. At Key Stage 3, IT is delivered across the curriculum, through subject areas other than IT. The school has a tradition in multimedia authoring, and has developed materials, some of which have gained National Educational Multimedia Awards (NEMA) awards. The school has been set up as an authoring centre since March 1996. While other schools within this project have been end-users of resources available, and could be termed 'user' schools, Netherhall School has been a major authoring centre and could be termed a 'generator' school.

1.22   The IT provision within the school is managed by three people: the IT co-ordinator, an IT teacher and an IT technician. These three individuals carry the various responsibilities concerned with the roles of IT co-ordinator, systems manager and network manager.

Manor Community School (School I)

1.23   Manor Community School currently has 450 students, from 11 to 16 years of age. There are 27 staff in total. The IT co-ordinator teaches IT, and the network manager runs the systems and supports the teaching in some subject areas, such as art. The school uses technology widely. It was one of the first schools in Cambridge to be connected to Internet, and has IT facilities within the library resource area, including a range of CD-ROM facilities. School use of the Internet over the past 18 months is now being supported further through the access provided by a Centrex link, a cable telecommunications link using telephone and modem connections, which provides free calls from school to school and from school to the LEA. There are two access points to the iTV system in the school, one in the central resource centre and the other in the hall.

Age range of pupils and numbers of teachers involved

1.24   The age of pupils in each school and the numbers of pupils and teachers involved in each school in using the iTV systems are summarised in Table 1.

Table 1. Age and numbers of pupils and numbers of teachers involved in each school in the trial

School	Age of pupils	Numbers of pupils reported to have been involved in class use	Numbers of teachers reported as having used the system
A	5-11	130 (approx.)	5 (Key Stage 1)
B	5-11	selected groups	3
C	5-11	190 (approx.)	7
D	5-11	270 (approx.)	10
E	5-7	60 (approx.)	3
F	5-11	30 (approx.) and an assembly group	4
G	7-11	0	3
H	11-18	author team, involving 52 pupils by May 1997, and selected groups	3
I	11-16	30 (approx.) and lunch-time groups	3

Evaluation

1.25   The evaluation methods used are given in the authors' information page, and can be printed as part of the Executive Summary (see Report D1).

Project initiation

1.26   The schools installed first on the project were the eight primary schools. At a later date, during the first 3 months of 1996, the two secondary schools and the higher education college were connected to the project.

1.27   Most of the teachers interviewed, and from whom questionnaire responses were obtained, used IT in lessons prior to using the iTV system, and a number of both primary and secondary teachers indicated that they taught IT in the school before the onset of the project. The use of iTV indicated by this group is based largely, therefore, upon practice that includes previous use of IT by those teachers in lessons.

1.28   Teachers reported in interviews and via questionnaires about their initial expectations of use. Many teachers (nine out of 23) indicated that their initial anticipation with regard to use of the system was high (only one indicated not); they were not opposed to use before trying it out.

1.29   Some schools were late in becoming connected to the project. The IT co-ordinator in one school indicated that the school had agreement in Summer 1995 for involvement in the trial. While the cable had been laid, access in school was not provided until January 1996. Final work was completed during a holiday period, but the school was unaware of its happening. By March 1996, the school had been using the iTV system for 2 weeks.

1.30   A range of problems have been reported from teachers, both technical problems arising, and misperceptions about the range of the trial. The headteacher in one primary school indicated that equipment was not fully installed on time, and that for a period of months there had been a box in school, but that this had not been linked up. It was reported from a number of schools that the presentation of project

intentions to staff had occurred before installation, but that it had been found that there was a marked difference between the perceptions gained from the presentation offered at the launch and the reality that was found in practice. Teachers thought they would have absolute access to a full range of programmes, rather than to a limited range of programmes. This meant that choice was extremely limited when needing to fit the use of programmes to a topic. It was reported that the initial message from Online Media was far too futuristic, and that it had been interpreted incorrectly. The effect was to cause dismay to teachers, and teachers in some schools immediately decided not to explore the facilities further.

Initial technical and educational training

1.31   No staff training had been arranged by Online Media for schools within the project. One day of training time for staff had been requested by one school from the consultant to Online Media. Some schools contacted Online Media directly when they required help, and others obtained details of programmes available in written form. It is recognised by many schools that Online Media responded readily to calls for help and support.

1.32   A variety of staff training methods were used within the schools involved, as summarised in Table 2.

Table 2. Forms of internal training

School	Type of internal training
A	lunch-hour exploratory sessions
B	updates in regular IT staff meetings
C	INSET from deputy headteacher
D	none
E	awareness-raising
F	awareness-raising
G	awareness-raising
H	not known
I	awareness-raising session

1.33   The forms of training reported by schools were detailed in questionnaire responses from teachers involved.

1.34   The means of staff development training provided for teachers to support their use of iTV reported by this group was largely awareness-raising and specific training sessions. There was little use or availability of on-hand support, and no materials to support training were provided or available.

1.35   Teachers reported on amounts of training provided. The system available used an infra-red control panel, and most teachers indicated that the amount of training provided through the awareness-raising and specific in-school sessions was considered by them to be about the right amount required.

1.36 Most training was provided through single-day events or sessions, with some on-hand support provided by particular teachers in some schools. One teacher in a primary school indicated that they were receiving on-going support from sponsors, and one teacher in a primary school and one teacher in a secondary school indicated that they were gaining support from colleagues in school.

1.37 As an example of the activities of one initial training session, all staff in one of the secondary schools were given a presentation of what was available on the system, to show them the potential of the system. The response from staff was mixed. Science staff identified some useful resources, whilst art and geography identified no useful resources.

Management strategies

External

1.38 The education element is only one of a number in this trial. There has been limited discrete management of the specific education element. A number of schools were invited to participate in the project, and more recently one school has become a leading educational partner, but this is still very much a company-led project. A consultant was appointed to co-ordinate the educational aspect of the project and relate to the evaluation team. There has been a lack of clarity about the objectives of the educational aspects of the trial. For example, the focus of the project appears to have been shifted from testing how schools use the technology and existing material to how schools can author material, which is a more specialised task.

1.39 The technical parts of the project have been managed by the marketing manager and the project manager of Acorn Online. Communication between the companies involved and schools has been limited. No ongoing management structure for the educational aspects of the overall trial exists. Limited training of teachers involved in the trial has been offered. Considerable progress has been made at Netherhall School, where one teacher has considerable experience of the innovative adoption of new technology.

1.40 While there has been limited application and use of the technology, especially within primary schools, these factors suggest that this is much more a result of management and communication weaknesses than necessarily problems with the materials or technology itself. If communication and management arrangements had been more widely possible and had been clearer, there would have been a much truer test of the technology.

Internal

1.41 Management of the internal/external interface with schools has not been strongly supported. Sometimes the internal management arrangements have enabled curriculum responsibilities and roles to be considered, but not technical ones. For example, in one primary school, it was recognised too late that the choice of socket locations was not well placed. The school felt that they should have had some advice on the siting. As a consequence, no programmes have been used in either a recorded state or live with children. Some teachers have felt that there has not been a great deal of information on paper from Online Media.

1.42 Internal management within the primary schools has been undertaken in a range of ways. In some cases, it has rested with the headteacher; in some cases with the deputy headteacher; and in others responsibility has been with a delegated member of staff, often the IT co-ordinator with a remit to develop practice within a classroom or across the school.

1.43   Management within the secondary schools has depended upon the ways in which resources have been used or generated. In a 'user' secondary school, which accesses resources without authoring them, the librarian has responsibility for the resource centre. The library contains IT resources, including CD-ROMs. The CiTV is placed in a corner of the room. The IT co-ordinator, network manager and librarian jointly decided on the position of the system, based upon the requirements that classes would need to gain access if required, and that it should be accessible at break-times and lunch-times. It was anticipated that whole-class, small pupil groups with learning support staff, individual pupils, and open-access use would all be likely modes of use. The librarian indicated that she would support staff if they had operational problems with the system. A booking system for use was also considered. The librarian indicated that she would investigate what was available on the system, which would help teachers locate what was accessible, and also pupils, when they wanted to use the system during break and lunch-times.

1.44   One school that is generating resources has used an authoring team to create curriculum materials, a Web-site, and fast Web access to on-line interactive video links. The authoring team is a mixed staff and sixth-form pupil team, run as a business. The IT co-ordinator is the managing director, and the 'company' holds regular board meetings. The authoring team developed and produced some 420 pages of material between June and November 1996. Of these, 400 pages were available as part of the Online Media facility, and some 20 pages were available as Web pages, which included animation and pictures. In order to create this bank of material, the IT co-ordinator had been involved in some 28.5 hours of time, and pupils had used some 150 hours of time. The IT co-ordinator is currently on a 55% timetable and has used time to create an authoring infrastructure, which was then used by pupils to author materials.

1.45   When authoring resources within a school, a range of management issues are raised with regard to copyright, intellectual property rights (IPR), and use of material generated by others. The stance taken by this school, which may not be that taken by others, is to accept that linking to other materials is entirely acceptable, even when this may mean in essence that code and graphics are taken from other Web pages which then appear as the school's own.

Obtaining and installing equipment

1.46   All hardware needed to access resources was supplied by the sponsors, but some schools have supplemented these resources themselves, for example one primary school purchased another TV. Hardware was in some cases installed before connections were made. This may have increased the likelihood of some problems. For example, one school had connectivity established but did not realise it. The physical network connection date to most homes and schools for the project was September 1995. The multimedia authoring provision began in May 1996.

Implementation at project and institutional levels

1.47   Initially, those schools and homes that were located on roads designated for the trial cable routes were asked to indicate their interest in involvement within this project. Schools involved have obtained access to at least one iTV system. They have deployed these in a variety of ways, which has determined, to some extent, both the types of access and frequency of access. Infrequent access and use has occurred where systems have been located in areas not generally used as open resource areas. This includes access within halls that are used mainly for assemblies and for activities including drama and PE. More regular use of iTV has been made where other technological resources are accessed or used routinely, including the library, open resource areas, and specialist IT rooms.

Further training and support

1.48   Acorn Online have provided a link for support throughout the project. Letters have been sent to update those schools involved about developments. A meeting with schools to outline future intentions was held on 17 July 1996. When technical problems were encountered by schools, contact was made with Acorn Online directly. Where schools made contact, they have reported that technical problems have been addressed and mostly resolved. Support for educational problems has not been provided within the project, but the facility to enable schools to have their own materials placed onto the system has been provided through the authoring centre at Netherhall School. Some of the primary schools have taken advantage of this facility. Schools have not contacted other schools for support, or to share experiences.

Implementation at classroom level

Raised standards, value-added and improved quality of work

1.49   Evidence of raised standards, and value-added and improved quality of work, is offered in this section from that collected and observed by a qualified OFSTED inspector, using the OFSTED framework.

1.50   Most visit requests to primary schools in the project were declined due to lack of confidence or use of the system. One school indicated that this was due to a lack of interest in the facility. One school has not yet opened some items from their packaging. One school is not currently involved because of the priority to prepare for an OFSTED inspection.

1.51   One primary school is using the TV resource available to it and they agreed to a visit. The system within the school is being used by a few teachers to support history and science work in Key Stage 2. Given the timing of the evaluation and the technological problems to date, it was not expected that any major shifts in patterns of educational practice would be observed. Evidence indicates that:

- there are no major shifts in patterns of teaching and learning

- the technology simply replicates the existing instructional practices of watching TV programmes

- the quality of work produced by pupils depends upon the means employed by the teacher

- where the teaching is effective, attainment is raised, although there is no evidence to show that the full potential of the resource is being used to extend pupils' own enquiry

- where a science programme is used for drill and practice before end of key stage tests, the results of tests reveal no significant improvement.

1.52   When questioned, teachers stated that the broadcasts were useful in presenting information in interesting and stimulating ways and in introducing, extending and reinforcing areas of learning. There have been numerous technological problems. However, teachers found the system convenient to use as it did not require additional time in recording broadcasts. In all cases, the management of the lessons using the resource was similar in that the whole class was taken to the library area to watch the television.

1.53   Examples of observed and evaluated use looked at two classes of Year 5 and 6 pupils who viewed a Channel 4 video on Ancient Greece. One class watched the video and then filled in a worksheet; the other group was encouraged to discuss

how some aspects of the past have been represented and interpreted in different ways; pupils here were working at Level 4.

1.54 Evidence of raised standards was dependent upon ways in which teachers used the video material. Teaching is effective when the teacher prepares the class for the broadcast and alerts the pupils to focus their attention on particular elements of the programme, reminding them to look for key points. During the watching of the programme, the teacher makes judicious use of the pause facility. This gives time to involve pupils in useful discussions and helps them to clarify ideas, extend their answers and offer personal views. After the broadcast, tasks are set that allow pupils to practise, develop and apply what has been learned.

1.55 Where attainment is high, a few pupils are beginning to evaluate the different sources of information and identify those that are useful for particular tasks. They know that changes, events and people have been variously interpreted and are able to suggest likely reasons; pupils here were working at Level 5, National Curriculum History.

1.56 The use of the video material is less effective when there is limited preparation of pupils, no adult intervention during the viewing and where the immediate discussion afterwards simply checks that pupils have been watching and listening. In some cases, worksheets are set as follow-on tasks. At best, these reinforce knowledge gained but do little to extend historical understanding.

1.57 Almost all of the programmes included in the trial were favourably received by the pupils. Questioning the pupils about their likes and dislikes of each programme revealed a variety of elements that made the video more or less interesting. Pupils liked the videos that were visually attractive, used reconstruction to help them understand and, in the case of the science material, were short and humorous. Some pupils disliked the science material, which they considered to be childish. They found the American accent distracting. Pupils felt that watching the videos helped them learn because in some of the material there was much repetition and key words were highlighted that were useful. This was particularly helpful for those pupils with special educational needs.

1.58 Throughout observations, analysis of work and discussions with teachers and pupils, there was no evidence of increased motivation of pupils.

1.59 In the case of Year 5 and Year 6 pupils, there was evidence of pupils developing information-handling skills appropriate to the resource.

1.60 Key issues emerging from these observations are:

- an absence of major shifts in teaching and learning

- the levels of impact arising from resource use are dependent upon individual needs (for the pupil, particular needs may be met; for the teacher, using the resource effectively is an important consideration; for the group, providing a common approach is an important consideration; for the school, there is a need to integrate progression and differentiation of use; for parents, the community and the LEA, there are sharing and moderation issues)

- the potential of the resource is not fully developed

- the school lacks the technical expertise to place its own material on the system.

1.61   The school recognises the potential of the system. However, the lack of technical expertise within the school and the constraints of time make it difficult to develop the system to support effective teaching and learning. The school would like to place its own material on the system, and recognises the possibility of this supporting moderation procedures across schools.

1.62   In another primary school, the headteacher gave clear indications that she intended to use the resource as a learning tool rather than a leisure tool. However, on visiting the school, the system was not operative. When questioned, the headteacher revealed that the system had been of limited use. Furthermore, she was concerned that TV may encourage pupil passivity in learning. The location of the equipment was proving to be problematic to the organisation of the school. Conflicting use occurred as it was located in an area also used for special educational needs support. As a consequence, priority was given to learning support staff working with pupils with reading difficulties. The CiTV trial has made no impact on the teaching and learning within the school.

Enfranchisement of previously disaffected learners

1.63   Teachers in five schools (three primary and two secondary) provided their comments on specific learning outcomes concerned with motivation and disenfranchisement. At this stage, most teachers are reporting that autonomous learning and motivation are not in evidence through use of the system. This is particularly true when those responses from teachers who 'generate' material for the system are not included. This supports the view that it is processes of 'generation' that may well be more supportive of motivation and autonomy of learning than merely accessing the system.

1.64   Features of use of the iTV system were that, in all cases reported, a common menu was provided for all pupils, supporting the view that the system is a delivery provision. While independent use of the system is reported, this is largely reported within secondary schools. Some teachers report the ability of pupils to select appropriate material for depth and content, but other teachers do not report this. There is no wide indication of characteristics that would indicate the use of the system leading at this stage to the support of autonomous learning.

Learners with special educational needs

1.65   While no teacher in any of the schools reported using material specifically with pupils with special educational needs, one teacher in a primary school and one teacher in a secondary school indicated that pupils with special educational needs had been able to access the iTV system. In some cases, pupils with special educational needs are supported by technological resources because of the particular attributes that are offered. Technology is 'patient' to those using it, and does not mind a great deal of repetition. In one primary school, pupils reported that the watching of videos had helped them learn because of these attributes; the repetition and the highlighting of key words was indicated as being particularly useful.

Fundamental new skills

1.66   With regard to the use of the iTV, most teachers feel that they are not working in different ways as a result of use of the system, and neither is their professional development being supported by the use of the system. This supports external views. When the views of those teachers who are 'generating' material are not included, the views become more strongly focused towards the system not enabling teachers to work in different ways, and not enabling them to consider that their professional development has been supported.

1.67   No signs of any potential changes in the ways in which pupils are working have been identified within this project, except for those involved in an authoring team. However, some teachers with considerable confidence in using the technology believe that the use of the system could enable pupils to work in different ways, by enabling work created at home to be accessed in school the following day, for example.

Development of information-handling skills

1.68   Information handling can be considered in two ways: firstly, the skills needed to access information; and secondly, the skills needed to manipulate information. The access system used by most schools in this project has not led to the development of new information-handling skills except in the operation of an infra-red control device. With regard to the authoring school, however, the authoring team have needed to develop skills concerned with information manipulation. Pupils in the authoring team have been involved in the creation of Web pages, in the manipulation of video imagery, still imagery, and the integration of text, sound and visual material. Some teachers and pupils have been involved in the integration of video, still imagery, sound and text, both within an Internet environment, an iTV environment, and between the two environments.

Relevance of information

1.69   Teachers have reported their views on curriculum relevance. While some teachers reported that material available via the iTV was not very relevant, or fitted inadequately, most teachers reporting indicated average or better relevance to material, and adequacy of fit with curriculum needs. However, a balance between the adequate and inadequate would have been obtained if 'generators' of material were not included within the sample.

Access and equity issues

1.70   Equity and access are not issues that have been raised particularly in this trial. It is reported from the school with the authoring team that more girls are involved than boys, as it had been found that boys were more interested in technical aspects than they were in authoring aspects.

1.71   The access that some pupils have at home has raised some concerns about access and specific use in schools. For example, because of the needs of the particular catchment area in one situation, the school focuses upon social development, so a new resource such as an interactive TV would need to find a place within a balanced curriculum approach that was concerned with language, spelling and mathematical development. Skilled teachers turn passive listening, such as that which may result from TV watching, into active listening.

1.72   The use of the iTV system is reported by all teachers responding via a questionnaire as offering equal opportunity of access for both girls and boys. However, the use of the system for the delivery of programmes rather than interactive use would enable this situation in many cases to be achieved without deliberate action or intervention.

Services and applications

1.73   In terms of programmes and resources available for home usage, given in more detail in Table 3, there were some changes to availability that may have had effects upon overall usage. BBC material available consisted primarily of radio programmes. The programmes identified by Acorn Online most used by home users were music programmes, comedy programmes, etc. All BBC material was available throughout January to August 1996. At the end of August, all the non-schools

material was removed. The Channel 4 service started in September 1996 and finished at the end of December 1996.

Table 3. Access and usage by home users of the trial, excluding all school use

Date period	Overall total use in minutes	Average time spent in category for each session	Total number of sessions
11 Sept 95 - 8 Oct 95	10237	24	424
9 Oct 95 - 5 Nov 95	8693	22	378
6 Nov 95 - 3 Dec 95	9637	22	429
4 Dec 95 - 31 Dec 95	7957	22	351
1 Jan 96 - 28 Jan 96	7646	30	252
29 Jan 96 - 25 Feb 96	10921	30	362
26 Feb 96 - 25 Mar 96	11884	27	437
26 Mar 96 - 21 Apr 96	10758	25	419
22 Apr 96 - 19 May 96	14617	33	433
20 May 96 - 16 Jun 96	8540	33	257
17 Jun 96 - 14 Jul 96	9310	31	298
15 Jul 96 - 11 Aug 96	10192	35	289
12 Aug 96 - 08 Sept 96	4550	24	189
09 Sept 96 - 06 Oct 96	9025	35	254
07 Oct 96 - 03 Nov 96	11960	38	310
04 Nov 96 - 01 Dec 96	9735	40	242
02 Dec 96 - 29 Dec 96	5375	29	183
30 Dec 96 - 26 Jan 97	4124	30	136

1.74   These data show that the greatest usage of the system (above 10,000 minutes in total for any 4-week period) was in September 1995, when the system was first introduced, between January and May 1996, in July and August 1996, and in October 1996. Average access times have been in the order of 30 minutes. In general, the total number of sessions have declined through the period of the trial.

1.75   Monitoring data from Acorn Online details the total time in minutes that each type of programme was accessed by home users during the trial period. These data show that the World Wide Web has generated the greatest usage time across the home trial, even though the facility was not accessible until March 1996. Major use, over 10,000 minutes in total, has also been generated by the BBC (largely radio)

programmes, Education Online facilities including software and material generated by schools, the NatWest Bank facility, Anglia Television programmes and Teletext facilities.

1.76   In order to access any programme, the user has to select programmes by moving through a hierarchical menu system. The total time in minutes of user access to navigational screens, i.e. menu screens and screens indicating how to select items, etc., was 23,663, while the total for non-navigational screens, i.e. when programmes are played, was 129,311 minutes. The percentage of home-user time on navigational screens was 18.3%, perhaps higher than would have been expected for general TV channel access.

1.77   Only one teacher from five schools reported having an iTV system at home as well as at school. Having a system at home was not considered universally as a useful support by these teachers.

1.78   Teachers indicated that they believe that pupils are not working in different ways as a result of the iTV system. If the perceptions of those teachers who have 'generated' material is not included, there is also little indication that pupils have been enabled to work in different places or at different times to those traditionally available. This would support the suggestion that processes involved where pupils manipulate material are crucial to the development of opportunities to learn in different places and at different times. The development of a fully interactive system, rather than one used as a delivery system, appears to be vital to the development of such potential. This would mean that the system would need to be linked to a facility that would enable selected material to be printed, the downloading of some material, and the manipulation of material from one area to other documents or resources. This form of facility is currently available where the computer is linked to the iTV system, such as at Netherhall School.

Access for learners and teachers/lecturers/tutors

1.79   The data presented in this section (see paragraphs 1.80–1.85) indicate details of usage for schools within the trial from data monitored and made available through Acorn Online. The eight primary schools have had access throughout the trial. The two secondary schools have only had access since September 1996.

1.80   In terms of programmes and resources available, given in more detail in Table 4, there were some changes to the availability that may have had effects upon overall usage. BBC material consisted primarily of radio programmes. The Acorn Online project manager indicated that the schools mainly accessed schools' radio programmes like Music Box and Something To Think About. The BBC schools' radio material was provided a half-term in advance of the half-term in which the programmes were actually broadcast. All BBC material was available throughout January to August 1996. At the end of August 1996, all the non-schools material was removed. The schools' radio material available from August to December 1996 was that available at the end of the Summer term, i.e. no new material was added. The Channel 4 service consisted of five programme series, each series consisting of about five episodes each about 15 minutes long. Four of these series were for the 7–11 year old age group and there was one aimed at staff INSET. The Channel 4 service started in September and finished at the end of December 1996.

Table 4. Access and usage by schools in the trial

Date period	Overall total use in minutes	Average time spent in category for each session	Total number of sessions
11 Sept 95 - 8 Oct 95	1491	30	51
9 Oct 95 - 5 Nov 95	1558	41	38
6 Nov 95 - 3 Dec 95	1389	29	48
4 Dec 95 - 31 Dec 95	176	44	4
1 Jan 96 - 28 Jan 96	1429	19	72
29 Jan 96 - 25 Feb 96	2082	35	60
26 Feb 96 - 25 Mar 96	1597	33	49
26 Mar 96 - 21 Apr 96	979	31	32
22 Apr 96 - 19 May 96	3538	45	79
20 May 96 - 16 Jun 96	2390	27	88
17 Jun 96 - 14 Jul 96	1811	35	53
15 Jul 96 - 11 Aug 96	423	24	17
12 Aug 96 - 08 Sept 96	51	18	3
09 Sept 96 - 06 Oct 96	1782	26	67
07 Oct 96 - 03 Nov 96	1130	22	50
04 Nov 96 - 01 Dec 96	1118	21	51
02 Dec 96 - 29 Dec 96	560	30	19
30 Dec 96 - 26 Jan 97	506	22	24

1.81 Table 4 (see paragraph 1.80) shows that the highest usage occurred during February, April, May and June 1996. Usage rates during school holiday periods were, as expected, much lower than during term times. Usage rates in more recent months have been lower than those previously monitored, perhaps an indication of the response of primary schools to the removal of the BBC programmes. Session lengths on average varied between 18 and 45 minutes. The highest number of sessions during any one month was in May and June 1996 (88 sessions). This works out as an average of 22 sessions per week, for eight primary schools being an average of nearly three sessions per school per week. Low rates of access were noted during the months of December.

1.82 Monitoring data from Acorn Online details the total time in minutes that each category of programme was accessed by school users during the trial period. These data indicate that the most widely used resources available have been the BBC programmes. There has also been significant use made of the Education Online facilities. Although there has been use of the World Wide Web facility, this is much lower proportionately than the access usage by homes.

1.83 The total usage time for navigational screens by schools was 3868 minutes. For non-navigational screens the total time usage was 16,017 minutes. The proportion of time used on navigational screens compared to that on non-navigational screens was 24%. This is a large and significant proportion of time, which is higher than that from calculations of home usage. This higher proportion could be for a number of reasons, all of which are supported by the evidence from teachers themselves:

- teachers have not always found it easy to access programmes they have wanted through the use of navigational screens

- teachers want to look at resources before they use them in the classroom

- teachers explore resources to a greater extent than home users who tend to focus more upon selected programmes.

1.84   Considering data that indicate the total number of sessions accessed by schools through the trial period on particular days of the week, the data suggest, from a very limited sample, that access to the iTV facilities is used to a greater extent during the former rather than the latter part of the week. The use of facilities on Saturdays indicates that teachers are previewing the resources for lesson purposes during weekend time.

1.85   Considering monitoring data that indicate the total number of sessions according to the time of day, the data show that the most popular usage times for the facilities have been between 8.00 a.m. and 9.00 a.m., and 12.00 and 2.00 p.m., although there has been high usage between 8.00 a.m. and 5.00 p.m. Use of the resources before lesson-times, during lunch-times, and after school should be noted particularly. The resources are clearly being used, as evidenced in other ways, not only during lesson-times for pupil use, but also:

- before and after school for preview of resources by teachers, from 7.00 a.m. until 11.00 p.m.

- before, during and after school for access by pupils, for example to access news items.

Interoperability with other networks

1.86   This is a new system under trial. It is stated by Acorn Online that the system evolved from proprietary systems at the start of the trial, when there were no standards involved, to a current system with a mixture of compliant standards. These standards include those for networking protocols (the Asynchronous Transfer Mode (ATM) Forum) through media encoding with Moving Pictures Expert Group (MPEG) to authoring platforms (including Hypertext Markup Language (HTML) 3.2, Macromedia Director and JAVA). The system is largely based upon the adoption of Internet-related standards, but the medium is a TV-centred one rather than an Internet-centred one. The system works in accessing Internet material through a TV platform. The system does not, for example, have an e-mail facility. If equipment connected to this system adhered closely to standards, then connectivity might not be possible. However, this was a discrete trial, and another trial set up that focused upon wider operability could address such issues. The system as it stands is capable of supporting a range of software, and offers access to the Internet. There is no reported lack of interoperability in gaining access to other facilities, but this trial has not allowed the interoperability to other systems outside this intranet to be explored.

1.87   Acorn Online state that the trial system itself will not be rolled out nationally, but that lessons learned are being used to inform further and future developments. Commercial and technical issues will need to be addressed before such a system becomes available within the marketplace. While other cable companies could mirror the development of Cambridge Cable, there are operational issues that all such companies face. Some of the major issues are concerned with 'rights' and other content-related matters.

Data speed

1.88   There have been no reports that data speed is limiting access or facility at this time. Indeed, this trial has offered full screen video, delivered from a central server, through cable, where the speed provides broadcast quality. Internet access on the

system is reported as being slow, but this is at times of the day when it would also be slow using other access means.

User friendliness

1.89   The results from questionnaires returned and completed by teachers in five schools indicate reports of user friendliness of the system. Teachers responding indicate largely that the iTV system is relatively easy or easy-to-use, and that it has helped them to save some amounts of time. Any underuse of the system, therefore, is not largely due to either lack of user friendliness, or the fact that it involves large amounts of additional time to be able to use it.

1.90   A summary of teacher reports of user friendliness, reliability and usability are offered in Table 5.

Table 5. Teacher reports of user friendliness, reliability and usability

School	User friendliness	Reliability	Usability
A	content with its operation	faulty set-top box reported	limited by resources available
B	content with its operation	no problems reported	limited by passive viewing offered
C	content with its operation	any problems have been addressed by Acorn Online	useful in a range of areas
D	teachers lack confidence with use	difficulty with IR panel operation	limited by resources available
E	content with its operation	no problems reported	limited by resources available
F	content with its operation	problems reported	limited by technical difficulties
G	teachers lack confidence with use	problems reported	limited by resources available
H	content with its operation	no problems reported	resources created
I	content with its operation	problems reported	limited by resources available and technical difficulties

1.91   The results from questionnaires returned and completed by teachers from five schools indicate their perceptions of the future potential of the system. In spite of any reservations that teachers may have, or any lack of direct use currently, the majority of teachers reporting indicate that they feel that there is potential for the use of iTV in school.

Cost issues

1.92 When deploying iTV, school-wide networking should be considered. VOD accessibility is not likely to become easily widely available. Cable companies are providing Internet access, which requires no software to run it, but not via iTV. Satellite TV companies may offer Internet via STBs on normal TVs in the future. Maintenance costs for such provision would be minimal, but adequate training costs would need to be considered. For authoring purposes, costs of a large server, peripheral equipment, authoring expertise, and authoring time should be adequately budgeted for.

Aims and outcomes

1.93 The Project Implementation Proforma indicated that the intention of the project was that learners would be able to 'use IT in the home environment in close association with school work. Use on-line services in both home and school environment. Undertake work in the home environment that is structured and enabled by and through on line services'. The commercial partners of the project have indicated their interest in the effect of the iTV upon schools and homes, but uses in homes and school have occurred independently, so aims and outcomes concerned with working between home and school in close association have not been fulfilled.

1.94 The Acorn Home–School Links Project has reached the stage where, without considered resource input, the use of the technologies within schools is likely to decline.

1.95 A particular virtue of this project, however, has been the opportunity to observe how schools might handle iTV systems that could become available in the future. The evidence suggests that if VOD resources are to be used by schools, then large banks of available resources for access will be required rather than limited quantities. Clearly there are major commercial implications. The potential of an interactive system that involves the opportunity to link and manipulate material between computer and TV systems has been observed within Netherhall School. Time available has enabled the school to demonstrate that the authoring and manipulation of material is possible, and that the linking of video material within Internet-based resources is also possible. So, for example, an Internet page from Netherhall School can provide a direct link to video material held on the Acorn Online video server. However, the use of such resources by teachers and pupils beyond those authoring the material has not been able to be demonstrated within the lifetime of this evaluation.

1.96 The trial has shown that material originally developed for delivery via narrowband networks can be delivered via an ATM network with additional advantages:

- increased speed of response, which is particularly important where full video transfer is required, without, for example, time-frame interruptions

- integration of material available with other media, where text, audio and video need to be synchronised exactly

- delivery via a TV system rather than a PC system, making it accessible to potentially more people who might have access to TV alone.