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**E-learning:
An evaluation review of practice across
the West Midlands Regional Broadband
Consortium**

18 March 2005

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Acknowledgements

The evidence and case studies presented in this review document have relied upon a very large amount of goodwill on the part of WMNet staff, LEA officers, project personnel, head teachers, teachers and pupils. While individual contributions and individual case studies have been made anonymous, the author would like to acknowledge with gratitude the contribution of:

- Caslon Primary School, Dudley LEA.
- Colley Lane Primary School, Dudley LEA.
- High Ercall Primary School, Telford and Wrekin LEA.
- Lawley Primary School, Telford and Wrekin LEA.
- Leasowes Community College, Dudley LEA.
- Manor Way Primary School, Dudley LEA.
- Milking Bank Primary School, Dudley LEA.
- Old Church CE Primary School, Walsall LEA.
- Pheasey Park Farm Primary School, Walsall LEA.
- Ridpool Primary School, Birmingham LEA.
- St. Alban's CE Primary School, Wolverhampton LEA.
- St. Bartholomew's CE Primary School, Wolverhampton LEA.
- Stow Heath Junior School, Wolverhampton LEA.
- Tettenhall Wood School, Wolverhampton LEA.
- Gradepoint initiative teachers, pupils and company personnel.
- Crossover Project personnel.
- ICT advisers in Coventry, Dudley, Telford and Wrekin, Walsall and Wolverhampton LEAs.
- Roger Blamire and Steve Horsfield, WMNet.

Contents

	Introduction	1
Section A	A summary of key points from an e-learning perspective	2
	The needs described by current government and DfES documentation	3
	What previous research says	5
	What a range of case studies across the WMNet region indicate	7
	How the NCSL describe an e-confident school, and how the school situations observed relate to this	12
	Action points and recommendations	12
Section B	Case Study 1: Developing e-learning in the school from the early years onwards, and through community involvement	14
	Case Study 2: Considering e-learning activities across the school	19
	Case Study 3: Developing use of a teaching environment across an LEA	22
	Case Study 4: E-learning using video-conferencing in a school cluster	28
	Case Study 5: E-learning across the school moving into home use	34
	Case Study 6: E-learning supporting secondary school subject needs	38
	Case Study 7: E-learning with an information focus	43
	Case Study 8: Considering appropriateness of on-line resources	47
	Case Study 9: Benefits of using interactive whiteboard technologies	52
	Case Study 10: Enhancing pedagogy and impacts of home access	59
	Case Study 11: E-learning with a focus on communications	65
	Case Study 12: E-learning and local library access	68
	Case Study 13: Developing e-learning from a limited starting point	73
	Case Study 14: Benefits arising from use of PDAs in literacy	77
	Case Study 15: Supporting pupils with specific behavioural needs	82
	References	86

Introduction

The Regional Broadband Consortia (RBCs) in conjunction with Local Education Authorities (LEAs) are playing vital roles in implementing an accessible broadband infrastructure for schools. The West Midlands Regional Broadband Consortium (WMNet) is one of the 10 RBCs nationally that are seeking to provide a broadband infrastructure for all schools in the region. A broadband infrastructure is likely to be the most essential key element in a provision for and support for e-learning in the future. Although the broadband infrastructure is not yet complete, many schools across the 14 LEAs that work through WMNet have already embarked on a road of e-learning developments and use. Examples of practice from across schools and LEAs are wide, and different examples offer pictures that exemplify the enormous variety that information and communication technologies (ICT) can offer, in terms of supplementing and enhancing teaching and learning practice.

This document details the findings of an evaluation review of e-learning practice across the WMNet region. It includes evidence of e-learning activities already in place across the 14 LEAs that constitute WMNet by offering case studies of examples of practice. Examples of practice were recorded on the basis of visits undertaken, with discussions and interviews with staff and pupils, and from direct observations of lessons and e-learning practices. Using these examples, the document considers how concepts and practices of e-learning might be viewed, how these practices match national strategies, and how e-learning might be described in terms of progress that has been made. It also considers challenges and issues that are likely to be faced by schools and LEAs in the near future.

This evaluation review report is divided into two main sections.

Section A provides an overview, divided into six sub-sections:

1. A summary of the key points that emerge from an e-learning perspective (including a consideration of current strengths, weaknesses, challenges, and issues for schools).
2. What current government and DfES documentation describes (in terms of strategies, policy lines, and targets - not just for ICT, but for other curriculum areas also).
3. What a range of research indicates (as reported by academic research teams as well as by Ofsted).
4. What the range of school case studies indicate (including details about the advantages and outcomes of broadband access and use).
5. How the National College for School Leadership (NCSL) describes an e-confident school (and how the current school situations relate to the NCSL description of an e-confident school).
6. Action points and recommendations (that arise from the evidence in this range of case study examples).

Section B offers 15 different case studies that highlight different approaches and different outcomes arising from e-learning practices.

Section A

A summary of key points from an e-learning perspective

1. E-learning is a major focus of government development, and is based on increasingly positive evidence of the benefits and outcomes of ICT uses by learners and teachers.
2. E-learning can apply to any and all subject and curriculum areas. Increasing exemplification of ways to use e-learning is becoming available on the DfES and government agency web-sites.
3. The e-learning initiative is an ambitious development, and much of its potential will rest on the ability of all schools and associated sites to gain broadband access as soon as possible.
4. The development of e-portfolios and lifelong learning records are at early stages in most schools.
5. Case studies can identify those instances where schools and LEAs have embarked on e-learning activities, and where benefits are already arising. In some cases, e-learning is providing contributions to teachers' and learners' needs. Those contributions are able to be identified, as are the particular qualities of those contributions.
6. Research indicates that a growing number of schools, teachers and learners are being positively affected by e-learning. The impacts of e-learning on motivation and on subject attainment are already positively documented.
7. Of the four categories of e-learning activity, those involving communication and involvement outside the school are those that are observed least.
8. The roles of head teachers, senior managers and ICT co-ordinators are crucial in taking e-learning developments positively forward. A focus on learning as well as on teaching is associated with those schools where most effective outcomes are being observed. Contexts are important, but schools that move forward look for opportunities that e-learning can offer, rather than looking at limitations in terms of implementation.
9. Laptops for teachers, interactive whiteboards or data projectors in classrooms, clusters or suites of equipment, and on-line resources, are all seen as providing important means to enable access and outcome.
10. Broadband access is enabling teachers and learners to use on-line resources more, to gain greater independence in terms of their learning, and to gain wider understanding of how technologies are supporting their learning.
11. Collaboration and team work in classrooms need to be reconsidered when looking at the potential that e-learning and broadband access can offer.
12. E-learning is becoming more focused at a year group level. Further detail should be documented to provide a more useful guide for teachers, learners and schools.
13. A focus on creating and capturing e-learning activities that enable learners to engage outside as well as inside the classroom would be worthy of more attention.
14. Few schools are likely to display all the NCSL 'e-confident school' features, but approaches taken by schools to each of these features is worthy of some consideration.
15. This evaluation review provides the evidence to support a range of suggested actions and recommendations for schools, LEAs and WMNet.

The needs described by current government and DfES documentation

Information and communications technology (ICT) has been a major focus of government development since 1998. The focus on development has not abated since that time, and government and DfES intentions are still concerned with an implementation of ICT that brings about effective outcomes from uses in teaching and learning.

Many examples of ICT use, across subjects and topics, can now be found by simple web-site searches. The DfES Standards site, for example, provides details and exemplification to support uses of ICT across the curriculum. A training pack for ICT across the curriculum (ICTAC) forms part of the Key Stage 3 National Strategy's support for whole-school improvement. The ICTAC pack provides a set of materials designed to promote the use of ICT across all subjects in schools. It also considers the value that ICT can add to teaching and learning in subjects, and the need for a whole-school approach to develop coherent and effective practice across the curriculum. Similarly, details of ICT uses can be found in separate subject areas on the DfES Standards web site. The National Numeracy Strategy section provides exemplification for using ICT to support mathematics in primary schools, in the form of materials and resources, for example.

A further focus for ICT uses has recently been detailed and developed by the DfES. This focus is concerned with wider uses of ICT, not just in a school setting, but also in home and public access areas. This wider concern, for implementing access and uses in and beyond the school, and for learners throughout their learning experiences, is termed 'e-learning'. The e-learning programme is ambitious. The Secretary of State for Education stated in the foreword to the consultation document on e-learning (DfES, 2003) that, "This is about embedding and exploiting technologies in everything we do, and getting ICT embedded across the curriculum for all subjects and in all pedagogues. E-learning has the power to transform the way we learn, and to bring high quality, accessible learning to everyone – so that every learner can achieve his or her full potential". Meeting this challenge will be demanding, and there will be issues to face as well as benefits to gain, in moving towards an end position that is in line with this aim.

The consultation document on e-learning states that all schools will have broadband connectivity by the end of 2006. However, the document also notes that the United Kingdom (UK) is well below the OECD average for broadband access. The importance of broadband access is recognised increasingly. For example, Ofsted reports that access, 'correlates with better teaching and learning on ICT in a school'.

There is a desire by government and the DfES to ensure, 'effective unified provision' with regard to e-learning, concerned with the development of a broadband connectivity for all educational organisations, the workplace, and the community. As the consultation document stated, 'e-learning is here to stay and needs to be managed'. It goes further, by saying that it is important to, 'establish the principle that all education and training organisations have the responsibility to contribute to a learner's e-portfolio for lifelong learning and support their development and progression'. The case studies within this review indicate how some schools and LEAs have taken strides already in this direction, and how these can provide examples of practice for others to use.

The consultation document itself on e-learning (DfES, 2003) gave some examples of e-learning practice: "They could be a pre-school child laying an interactive game; they

could be a group of pupils collaborating on a history project with pupils in another country via the Internet; they could be geography students watching an animated diagram of a volcanic eruption their lecturer has just downloaded”. What is clear from all these examples is that they imply effective infrastructure and sufficient bandwidth. As the consultation document goes on to say, “e-learning exploits interactive technologies and communication systems to improve the learning experience”. Examples of practice that exist in situations where infrastructure and bandwidth are appropriate to these forms of needs are the forms of examples offered in the case studies presented in Section B in this review document.

Case study examples can provide valuable ideas of approaches that can be tried out within particular contexts. The need for case study examples that illustrate current practice was highlighted by the e-learning consultation document when it said, “e-learning is not embedded in our teaching and learning, at any level. We need an e-learning strategy that touches the life of every single learner”. In examples of practice that inform this current review document, the benefits of e-learning are apparent in a number of cases. As the consultation document said, “it is important because people are finding that e-learning can make a significant difference: to how quickly they master a skill; how easy it is to study; and, of course, how much they enjoy learning”.

The consultation document suggested a number of ways in which e-learning could benefit the education system. The case studies presented in Section B provide some examples of how these benefits are already being seen in practice in some schools (the table following lists the case studies that illustrate each specific area of benefit identified in the consultation document).

Benefit	See Case Study
Empowers learners	1, 10
Be creative and innovative	2, 7, 11
Offer flexibility	3, 6
Achieve better value	5, 9, 14
Generate a professional workforce and fulfilled citizens	4, 8, 12

Table 1: Benefits of e-learning demonstrated in particular case studies

The consultation document also suggested that e-learning could contribute to teaching and learning in a range of ways. How e-learning contributes to these aspects of educational need is exemplified in the Section B case studies (the table following lists the case studies that illustrate each of the individual contributions that e-learning can make).

Contributions	See Case Study
Raising standards and improving attainment	4, 14, 15
Increasing retention and improving outcomes	5, 10
Broadening choice	6, 7, 13
Providing support for children at risk	3, 9
Increasing access to learning for disadvantaged communities	1, 8, 11, 12
Removing barriers to achievement	2

Table 2: Contributions of e-learning demonstrated in particular case studies

The consultation document stated that e-learning could improve the quality of learning experiences. How e-learning can improve the quality of the learning experience is detailed in some of the section B case studies (the table following lists the case studies that illustrate the qualities within the document).

Quality	See Case Study
Individualised learning	3, 4, 6, 7, 8, 12, 14
Personalised learning support	3, 4, 5, 7, 8, 9, 11, 15
Collaborative learning	1, 4, 7, 8, 12, 15
Tools for teachers and learners to innovate	1, 4, 6, 10, 11
Virtual learning worlds	3
Flexible study	3, 12, 14
Online communities of practice	4
Quality at scale	Not observed

Table 3: Qualities of e-learning demonstrated in particular case studies

This review document provides examples of practice through case studies, illustrating a range of developments that are being encouraged by government and the DfES (for reasons shown in the tables above). These e-learning developments are being encouraged on the basis of positive findings associated with these forms of observed practice. The case studies in this document indicate positive outcomes arising in each instance, and these positive outcomes are in line with the forms of outcome identified by previous research studies and from those shown by observational findings in other instances.

What previous research says

Ofsted, in reviewing the outcomes of the ICT in Schools programme in 2004, detailed a range of main findings, indicating positive outcomes in some respects, but a need for further focus in other areas. The report stated that, ‘The combined impact of government initiatives for ICT in schools has been significant. The competence of staff in ICT has increased dramatically since 1997 and steadily since the last report in this series in 2002. Over 90% of teachers observed were competent users of ICT and the Laptops for Teachers scheme continues to have a major impact on this. Schools’ ICT resources are now at record levels, comparing very well with other countries. This overall positive picture conceals wide variations in both the impact of training programmes and the provision of hardware. In particular, whole-school computer–pupil ratios in secondary schools often mask continuing difficulties of access for individual departments’.

The report went on to say that less impact had been noted in subject areas other than ICT, ‘the outcomes of the initiatives are more evident in improvements in pupils’ achievements in ICT capability than in their application of this learning in other subjects. The incidence of the effective application of ICT in lessons across subjects is increasing slowly but steadily. The impact of ICT on teaching was rated satisfactory or better in 77% of the schools visited, a slight increase since the last report. The quality of teaching in lessons where ICT is used has improved, with 59% of lessons rated good or better’. The report highlighted the fact that, ‘the gap between the best and worst ICT provision is unacceptably wide and increasing. In the most outstanding examples, ICT is starting to have a pervasive impact on the way teachers teach and children learn. But the quality, diversity and extent of pupils’ ICT experiences vary widely between schools’.

The work of the RBCs and LEAs in providing a reliable and robust communication infrastructure was also highlighted in the Ofsted report. The report stated that, ‘the government’s initial target of connecting 20% of schools to broadband by August 2002 was met by the RBCs. By July 2003, they had ensured that 50% of all schools and 90% of

secondary schools were connected to broadband. This has had a significant impact on the quality and range of work that schools can undertake. In particular it has made systems faster and more robust. Few schools as yet make significant use of applications that specifically require broadband’.

The impacts of ICT upon teaching and learning were commented on by Ofsted within the report. The report stated that, ‘the positive influence of ICT in schools continues to rise and can no longer be denied. Although, as yet, ICT is by no means at the heart of our education system, it is now widely recognised as an essential tool for learning in the twenty-first century. Indeed, it is vital that today’s children are enabled to take advantage of lifelong learning if they are to survive the constant pattern of change that is likely to mark their working lives. This means not only being comfortable with ICT as a medium, but also being able to exploit its potential to the full and understanding the ways in which ICT can make learning more effective’. The report went on to say that, ‘evidence also shows a clear place for pupils’ use of ICT across subjects where the learner is using ICT purely as the medium for learning and where prior learning in ICT capability is not utilised. The gains in such experiences include being able to control the pace and order of learning and the clarity of exposition through animated graphics or video clips. The role of the teacher in this activity paradoxically becomes more significant; the mix of human and computer interactions is the telling factor’.

There is an increasing bank of case studies available that show how schools are approaching uses of ICT. Case studies show that ICT is providing a very wide range of opportunities for both teachers and learners, and that outcomes are often related to abilities to adopt and implement particular strategies to meet particular situations, rather than the use of a common set of practices used in an off-the-shelf way. However, case studies show also that common elements concerning ICT implementation, uses and outcomes are emerging. For example, a range of European studies (ERNIST, 2004) identified a range of features that were important when outcomes of uses of ICT in selected schools in 6 inspectorates were considered. These included:

- Head teacher and senior management commitment.
- Teacher willingness to adopt new technologies.
- Access to effective teaching materials.
- Creating an ethos of continuous professional development.
- Motivational impact of ICT on teaching and learning.
- Developing pupil ICT skills in conjunction with opportunity for application.
- Incorporation of ICT into subject curriculum areas.
- Encouragement for staff and pupils to ‘try things out’.

In terms of some of the observed positive impacts that are associated with ICT uses, enhanced motivation and subject attainment have been the subject of a range of research studies over a number of years. An early study for the DES reported motivational effects as an important outcome within the original Impact study (Watson, ed., 1993). More specific studies into motivational effects were undertaken for NCET by Cox (1997) and Denning (1997). Whilst these two studies identified motivational outcomes and benefits for pupils, the relationship between forms of technology and forms of motivation were not strongly explored. However, motivational effects arising from specific forms of technology were identified in, for example, the ILS studies (NCET, 1994; NCET, 1996; Wood, 1998), the Superhighways evaluation (Scrimshaw, 1997), the Anytime Anywhere Learning (AAL) study reports (Rockman et al., 1997; Passey et al., 2000; Passey, 2001a),

and the development of interactive content for Year 7 pupils, such as that in mathematics (Passey, 2001b), and in Latin and Japanese (Denning and Fisher, 2002).

Studies by Becta (2000, 2001a, 2001b) have indicated the enhanced attainment that uses of ICT can bring to schools and to pupils, and a part of this was the recognition of motivational effect. More specific findings have emerged as a result of the ImpaCT 2 study (DfES, 2001a), the Pathfinder evaluation study (Somekh et al., 2001), and the Home ICT and School study (DfES, 2001b). The ImpaCT2 report (Harrison et al., 2002) provided an indicative gain for each subject at Key Stage 4 (GCSE) when ICT was characterised as either 'high' or 'low'. As the report said, "in all subjects investigated the pupils characterised as high ICT users outperformed, on average, low ICT users". The report went on to say that, "In the case of design and technology, the subject with the highest reported level of use of ICT, differences in favour of higher ICT levels were found to be statistically significant in all analyses".

A more recent study for the DfES on the motivational impacts of ICT on pupils (Passey and Rogers, 2004) identified key findings in terms of learning outcomes:

- 'Pupils and teachers in this sample of schools widely reported that using ICT has positive motivational impacts upon learning. The forms of motivation identified are supporting positive pupil commitment to a desire to learn and to undertake learning activities.
- 'Pupils and teachers recognised that some aspects of quality of work are improving when ICT is used, that attitudes towards school work and homework are often more positive, and that pupil confidence and abilities to perform learning tasks are often enhanced.
- 'Some teachers in some schools recognise that their expectations of pupils are rising since using ICT and from the motivations arising from use. Pupil expectations are also rising.
- 'A small number of teachers reported that motivation arising from the use of ICT is having an impact upon attainment. This is particularly the case where pupils have difficulty with motor control and writing skills. In many specific subjects this is difficult to quantify, but there are indicators in secondary design and technology, which suggest that improvements in attainment can occur when using ICT under particular conditions.
- 'To maximise motivational impact, ICT needs to be used in subject specific ways and to be embedded in teaching and learning'.

The research evidence indicates that there are positive ways in which e-learning can influence outcomes for teachers and for learners. A key issue for schools, LEAs and RBCs is how to ensure that these positive ways are known in some detail, how they can be recognised, and how they can be applied in a range of different situations to support learners and teachers more widely.

What a range of case studies across the WMNet region indicate

In preparation for this evaluation review, LEAs within WMNET were asked to identify school examples that demonstrated aspects of e-learning activities. For each case study example, similar aspects were explored as a part of the evaluation review:

- School background.

- ICT background.
- ICT and the curriculum.
- Experiences with broadband access.
- Broadband access and content.
- Pupil uses of ICT.
- Links to uses beyond the school.
- ICT in the future.

Categories of e-learning activities observed

Overall, the case studies indicated that e-learning activity could be placed into four distinct categories:

- In-school e-learning activities.
- Out-of-school e-learning uses.
- Links between in and out of school uses through e-learning.
- Links with parents.

The categories of e-learning activities most widely developed

The category that was developed most widely in this review sample was in-school e-learning activity. This activity was concerned mainly with:

- Use of computer suites.
- Use of interactive whiteboards.
- Uses through appropriate year group activities.

Out-of-school e-learning activities

Out-of-school e-learning activities were developed less. However:

- The number of pupils with access to internet at home is increasing.
- Access to on-line content resources is increasing.
- Home use of resources is often confined to 'click and view' activities.

Links between in and out of school uses were not extensively developed. However, where these did occur:

- The links benefited pupils in some cases.
- The links tended to happen, rather than their being planned or supported.

Links with parents were:

- Strong in some schools.
- Enhanced through initiatives like SureStart, for example.
- Enhanced through adult education opportunities in some schools.
- Developed through Family Learning sessions with some year groups.

Key points arising from the case studies

A number of key points arose when the case studies were viewed from an e-learning perspective. Key points are grouped below, and frequencies of cases arising are shown where possible.

School background

1. ICT development was taken forward strategically in thirteen schools by the head teacher, supported by senior managers and an ICT co-ordinator.

2. ICT deployment was seen in these schools in the context of learning need, teaching need, the opportunities that space and buildings provided, and the limitations that needed to be addressed. In one school, a wireless network and laptops were used to address space limitations.
3. Five schools focused development on learning not just through implementing ICT uses, but also through the integration of other schemes such as the Accelerated Learning Scheme.

ICT background

4. An interactive whiteboard, or data projector and screen, was installed in every classroom in eight schools. A trial set of PDAs was being used by some pupils in two schools. The focus of ICT strategy in four schools was on pupil use and pupil ownership of learning activities. One school had an ICT suite that was jointly used by the school and the community, with a small suite of machines to support staff use.
5. Staff access to laptops had been reported to be an important means to support the development of teaching resource uses in seven schools.
6. MS PowerPoint had been reported to be used as the medium to produce resources that supported lesson planning and lesson activity generally in four schools.

ICT and the curriculum

7. Pupils in eight schools and one LEA project were able to recognise how different forms of ICT, and different programs, were aiding their learning.
8. In one school, a new course to address the media literacy needs of pupils was being developed.

Experiences with broadband access

9. Teacher use of on-line resources had been reported to have increased in thirteen schools and in one LEA project, since teachers had been able to use the rapid broadband access to internet based resources. One school provided a favourites list that was regularly added to and updated. A classroom assistant supported teachers with the identification and capture of resources in one school.
10. E-learning activities had been supported by the collaborative endeavours of a network of schools, and by collaboration with and across the LEA in three schools.
11. Collaboration with similar schools in one LEA had enabled pupils to use video conferencing, to support aspects such as comprehension in literacy.
12. Collaborative use of an on-line environment in one LEA had been possible through the broadband access available.

Broadband access and content

13. Communication across the staff was reported to have been aided by the use of email in three schools, and teachers and pupils use shared areas a great deal. Teachers and pupils in thirteen schools used a variety of internet-based resources, but CDs were not generally.
14. In one school, broadband access enabled a teacher to set up a web-cam at home so that pupils could see a swallow's nest when the young were hatching and growing up.

Pupil uses of ICT

15. Pupil attainment on joining three of the schools was reported to be below the national average, and in these schools uses of ICT were seen as ways to support the raising of attainment under these circumstances, even from young ages.

30. Pupils in two schools used email to communicate with an expert when working on a particular project.
31. Pupils were using an on-line teaching environment in one LEA to gain access to lessons when they were not present in school. Pupils used the same on-line facilities at home to review work done in school.

ICT in the future

32. Head teachers and teachers in nine schools were aware of a number of aspects that would help to move ICT development and its impact upon learning further forward.

E-learning activities and specific year groups

From the observations made, it was clear that different year groups were using ICT to support e-learning in different ways, and pupils were often provided with particular opportunities to support their e-learning needs. The table following provides an overview of outcomes from across the range of case studies.

Year group	Outcomes observed
R	Computers are used for consolidation and reinforcement purposes, for research, and for watching videos. ICT is often used as an activity for pupils to choose. Pupils like interactive whiteboards, and the pens are found easier to use than a mouse. Pen control is found to help mouse control. Sharing and turn taking is being encouraged through uses of ICT, including uses of interactive whiteboards. Letter development and matching exercises are activities often run on interactive whiteboards.
1	ICT is used in conjunction with real objects, and with books. Interactive whiteboards are used for research activities, as well as consolidation and starter activities, and often for numeracy activities. Interactive whiteboards need to be set at a height suitable for the age group of the pupils. Books displayed on interactive whiteboards are often easier for pupils to see. Literacy activities are often run in ICT suites as well as in classroom settings.
2	The Roamer is used in a variety of settings. Interactive whiteboards are enabling some activities to be undertaken by pupils at earlier ages, such as classification activities in science. Pupils are being encouraged to discuss and ask questions more in situations where interactive whiteboards are used effectively. Interactive whiteboards are increasingly used for research and numeracy activities.
4	On-line and web-site content is used for research purposes increasingly. Teachers ask pupils how ICT can be used to support their learning more. When pupils choose ICT activities, they tend to choose interactive exercises first, video activities second, and writing or drawing activities third. Typing skills are sometimes limited. Interactive whiteboards are used for mathematics activities, for starters and often for plenary sessions. The visibility that interactive whiteboards provide is important for this age group, as they become more inclined to be distracted by other events around them.
5	An increasingly wide range of software is used by pupils, including uses of spreadsheets and control software. Pupils use ICT for on-line survey work, and to hear texts being read out. Interactive whiteboards are used for clarity, and for recording work done by pupils. Work is shared with other teachers. Some teachers have access to a favourites list.
6	On-line resources are used by pupils using interactive whiteboards in classrooms. Pupils use on-line resources to choose topics for revision purposes. Teachers maintain discussions and pace when interactive whiteboards are used. Pupils are organised into teams so that work can be done in groups. Some on-line resources are chosen for individual work, others for paired work, and yet more for group work activities.
10	Pupils can become involved in courses that are more focused on media and creative media. Some subject activities are concerned with capturing outcomes of ideas through video and video editing. ICT is used to accelerate the delivery and course needs for certain subject courses.

Table 4: Observed e-learning outcomes associated with specific year groups

How the NCSL describe an e-confident school, and how the school situations observed relate to this

The “e-Confident” school is described by NCSL in terms of 10 key features:

1. High levels of staff confidence, competence and leadership.
2. Re-engineered teaching, learning and assessment, integrating effective use.
3. Leading and managing distributed and concurrent learning.
4. Effective application within organisational and management processes.
5. Coherent personal learning development, support and access – for all leaders, teaching and non-teaching staff.
6. Secure, informed professional judgement.
7. Appropriate resource allocation to ensure sustainable development.
8. Availability, access and technical support.
9. Pupils/students with high ICT capability.
10. School as the lead community learning and information hub.

Evidence collected from the schools observed, suggested that a number of these features had been achieved in a number of cases. In other cases these features were a focus of development (and the school approaches being undertaken in these cases were felt worthy of being considered by other schools wishing to explore these factors further). The table following shows the case study examples where NCSL e-confident school features were being explored particularly.

NCSL ‘e-confident school’ feature	See Case Study
1. High levels of staff confidence, competence and leadership.	2
2. Re-engineered teaching, learning and assessment, integrating effective use.	6
3. Leading and managing distributed and concurrent learning.	3
4. Effective application within organisational and management processes.	14
5. Coherent personal learning development, support and access – for all leaders, teaching and non-teaching staff.	8
6. Secure, informed professional judgement.	15
7. Appropriate resource allocation to ensure sustainable development.	5
8. Availability, access and technical support.	4
9. Pupils/students with high ICT capability.	10
10. School as the lead community learning and information hub.	1

Table 5: Features of the NCSL ‘e-confident’ school demonstrated in particular case studies

Action points and recommendations

This review, based on the 15 case study examples presented, indicates that a number of actions would be worthy of consideration at this time:

1. ICT can be used to support learning and teaching in very many different but effective ways. Identifying effective uses and outcomes should be a continuous focus during a period of time when new technologies are emerging.
2. A focus on e-learning applications that involves learners in situations outside as well as inside schools would be of particular value, as few currently exist.

3. Case study examples should not only provide details of the context in which they are set, but also the benefits arising from e-learning, the contributions that e-learning offers, and the qualities that it provides for learners and teachers.
4. Enhanced motivation and enhanced subject attainment arising from the uses of ICT have been identified. Further case studies to identify how these outcomes have been brought about would be of particular value.
5. A focus that looks at how schools are using ICT with parents, as well as how schools are engaging parents in a wider sense, would be of value to future e-learning needs.
6. Broadband access is being seen to be of increasing value in schools. Wider access should be made available to ensure that all schools have access by the end of 2006.
7. Staff access to laptops, and class access to interactive whiteboards or data projectors are seen to be of particular value. One element of the value gained is the ability of teachers and pupils to identify the benefits that arise.
8. Educational access to web-cam, video broadcast and video conferencing facilities would be worthy of greater exploration.

Section B

Case Study 1: Developing e-learning in the school from the early years onwards, and through community involvement

Summary of key points from an e-learning perspective

1. The school is part of an education action zone, and serves a community with a high level of social deprivation. Pupil attainment on joining the school is below the national average.
2. ICT development has been taken forward strategically by the head teacher, and will be supported by an ICT co-ordinator from 2004.
3. The school has an ICT suite that is jointly used by the school and the community, a small suite of machines to support staff, and an interactive whiteboard or data projector and computer in every classroom. A trial set of PDAs is being used by some pupils. The focus of ICT strategy is on pupil use and pupil ownership of activity.
4. The introduction of interactive whiteboards has already been seen to have a positive impact upon year R and Key Stage 1 pupils. Writing and literacy aspects have been supported, as well as sharing and turn-taking. Pen control also appears to aid mouse control with year R pupils.
5. In Key Stage 2 the visual nature of interactive whiteboard resources has supported the engagement and understanding of boys particularly. In year 4, a data projector has been used successfully to support a wide range of curriculum activities.
6. Teachers have used the rapid broadband access that is available to internet based resources. The school provides a favourites list that is regularly added to and updated.
7. Communication across the staff is aided by the use of email, and teachers and pupils use the shared areas a great deal. Teachers and pupils use a variety of internet-based resources, but CDs are not used generally.
8. Pupils are able to recognise how different forms of ICT, and different programs, are aiding their learning. Examples of how MS Word has aided writing and reporting, and the spelling of words that have been learned, were reported by individual pupils.
9. Pupils reported that the use of an interactive whiteboard or data projector was aiding their learning environment and their learning. The ability of everyone to see what was being done (without having to crowd around one machine), everyone getting a turn, and the benefits of hearing the views of others, were all identified by pupils as being advantageous. Pupils felt the use of the interactive whiteboard or data projector helped with listening to the ideas of others, and sharing, and that a friendlier environment had been created, in which it was easier to learn. They indicated that visualisation was important, because reading something did not necessarily on its own enable an understanding of what was intended.
10. The school has used ICT to enable pupils and parents to work together on some activities.
11. The school is at the heart of a community action group, and ICT facilities are used to support community involvement and activities. Some parents already report that their understanding has been shifted as a result of some activities. There are certain issues to be addressed if there is to be a wider engagement of the parent population. The use of PDAs could help to address some of these issues, and could support a focus on enhanced verbalisation of parents and pupils.

12. The school is aware of a number of aspects that will help to move ICT development and its impact upon learning further forward. The ICT co-ordinator intends to focus on curriculum areas such as control and sensing that are currently not so well developed. Involvement in the use of PDAs by pupils is a major area of development initiative for the school in the immediate future.

School background

The school is part of an education action zone (EAZ), and serves a community where there is a high level of social deprivation. There are some 219 pupils in the school in total. Pupils enter the school with low attainment by national average, and attain at lower than national average scores at Key Stage 1 and Key Stage 2. The school has a high staff turnover. Most staff are new – only 2 have been in the school for more than 18 months. The current head teacher has been in post for one year.

ICT background

ICT development has been taken forward strategically by the head teacher, and a newly qualified teacher is to be appointed as ICT co-ordinator this year. The head teacher was able to use the ICT development experiences brought from his previous school, where he had developed the use of interactive whiteboards in ICT.

Four and a half years ago ICT was deployed in the school in the form of ICT clusters, rather than in an ICT suite. Now the school has an ICT suite with 16 machines, which have dual use, by the school and the community. There is a small suite of 7 machines, which is used to support staff. There is an interactive whiteboard or data projector in every classroom. The head teacher feels that use of interactive whiteboards should be owned by pupils as far as is possible. So, in the early years interactive resources are used, by pupils selecting 'free' activities, as well as in more structured sessions, and the pupils work on the interactive whiteboards as much as possible.

Although the school has a suite of machines, and a computer in each class, access is still found to be an issue. The school is to become part of an LEA initiative, trying out the use of a set of PDAs with a group of pupils.

The school has not developed an intranet at this point. There has not been any use of communication technologies such as video conferencing at this stage.

ICT and the curriculum

The introduction of interactive whiteboards has been felt to have a positive benefit, especially for year R pupils. Year R teachers have used the interactive whiteboards to write letters large, and it has been felt that this has helped pupils with writing. Pen control has also seemed to help mouse control. Teachers with year R pupils use a range of resources such as Star Words. Letters are dragged to key positions to form words, and matched with other letters, for example. The use of the interactive whiteboard is felt to be encouraging pupils in terms of sharing and turn-taking.

In the upper school, not so much impact has been recognised at this stage. Teachers are using the interactive whiteboards to do presentations, and in this way the resource is more of a teacher's tool than a pupil's tool. However, the visual nature of the resource is used, and it is felt that boys are responding well to this form of use. One teacher has used on-

line games with the interactive whiteboard, and felt it helped in particular ways. The resource was used to explain things that could not be done otherwise: for word joints (which are not easy to do on paper), and for clock work (moving between digital and analogue clocks).

The ICT co-ordinator designate has worked with year 4 pupils this year, with a data projector and static whiteboard. She has found it is easy to run software and to access resources. She has used the resource, at particular times, in all lessons except physical education (PE). She has found that she has used the equipment mostly in starter and plenary sessions, and for covering specific points in main activities. She finds it offers certain benefits: she can bring up a flag of a country instantly, and everyone can see it. She uses a range of resources, such as mathematics and literacy resources (some Espresso materials, some National Strategy materials, and some created in MS PowerPoint). She uses the resource facilities to hide and reveal answers (which pupils treat as a game). She can find things and use them easily, and the resources are found to be colourful. Some facilities enable things to be done that would be difficult otherwise, such as counting degrees on a protractor; pupils watch what is being done and then can do it by repeating the exercise. She finds the equipment helpful for pupils with special needs. She can print out things immediately, so pupils have access to it (which saves them a lot of time in not needing to copy everything). She finds that pupils tend to attend and engage more when the equipment is used, and pupils share more and collaborate. She feels the equipment 'makes things interesting'.

Teachers have rapid internet access, and internet sites can be easily accessed. They have access to a database of favourite sites in a shared area that the head teacher developed and brought from his previous school. This list has been added to this year. New ideas for sites are also written on the boards in the staff room.

Experiences with broadband access

Broadband access has recently been established for the school. An immediate effect has been the use by teachers to access resources as and when needed. This has been aided by the favourites list that is updated and added to regularly. Communication is done via email in the school. Shared areas are used a great deal, both by teachers and by classes of pupils. Innovative approaches to teaching and learning are beginning to appear in some areas of the school, but the head teacher feels that NQTs require support in moving away from using 'off-the-shelf' lessons, if innovative outcomes are to be developed and seen more in practice.

Broadband access and content

Broadband is accessible across the school, but the managed service provision (MSP) means that access to and use of plug-ins has been an issue (for example, there has been no access to Real Player or Adobe Acrobat). The school has subscribed to Espresso, and this is used widely, as have internet-based science resources and other internet resources (BBC sites are found to be useful, for example). CDs are generally not used by staff.

Pupil uses of ICT

borders (from ClipArt or internet sources), that fonts and colours could be chosen, and the work could be easily put into paragraphs. One girl said that it was not possible to create different styles of font when hand writing, and not possible to have a spell check available. One girl said it helped to choose and to learn words, and that an auto correct helped with spelling. One girl gave examples of two words that she could spell correctly as a result of the use of a spell checker ('people' and 'friend'). The boy indicated that it was possible to feel more confident about publishing work when using ICT programs, being able to choose effects and colour in WordArt (he described the design of a poster about 'homeless people'). One girl talked about the use of colour backgrounds, and another girl described how MS PowerPoint could be used for homework, at home or at school. Another girl described how MS PowerPoint helped with the structure of work and points being made, being able to use a different page to structure work easily, or how paragraphs, animation or pictures could be used.

The pupils said that their favourite programs were Zoombeenies (in 2 cases), MS Word, Spooky Castle, and RM Maths. They said the programs that helped them most with their learning were RM Maths (in 2 cases), and MS PowerPoint (in 2 cases). They also described the advantages of an interactive whiteboard or a data projector. They said that everyone could see things easily, and it was possible to work more easily as a class or in groups around a table. They indicated that everyone could take part, that when everyone was crowding around a computer to see something, it was much harder. They also indicated that everyone got a turn, and everyone's ideas could be taken (that it was important to have different ideas as well as one's own points of view being given). They said they were sometimes surprised by other people's ideas, and through this form of listening and sharing, it was easier to make friends and easier to learn when there was a friendlier environment. They said it was more interactive, and they could see things more easily and understand better. They said they could see things that could not be seen on one computer. They said that visualisation was important – that when they were involved only in reading, that they could not necessarily see what was intended.

The pupils that had used some trial PDAs were impressed by the facilities that the equipment offered. They found they could use them to take photos and video clips, which were useful for reporting purposes. By using the PDAs, they had found out which part of the school made the most noise, for example. They had used them also to create text, to copy text, and to use this text on a main classroom computer.

Links to uses beyond the school

The school has been involved in developing links beyond the school in a range of ways. With year 2 pupils for example, a Family Learning initiative has been run, with ICT activities being undertaken by pupils and parents working together. With year 3 and year 4 pupils, story telling with an author has involved both parents and pupils.

In this area of high social deprivation, varying expectations and aspirations are found across the parent population and the community. Working on parental attitudes is being actively considered and addressed. The estate that the school mainly serves is regarded as a 'close' community, and it is recognised that there is a need to build capacity in this community. With the forms of support being provided already, some parents are indicating that they are being affected positively. For example, some say their understanding in some areas has already been shifted.

The school is at the centre of a community action group (a partnership), and 140 pupils are enrolled currently at the Youth Centre (which is located in an old mobile on the school grounds). The school provides adult education opportunities, using adult line workers. There is a community area within the school, which provides an ICT suite and community room. A variety of courses are run, including English language for Yemeni mothers, START courses, netball and keep fit classes. The head teacher feels there is a need to offer a mix of fun and educational courses. Up to this point, probably some 20% of parents have been involved – to increase this proportion, it is recognised that issues that working mothers face will need to be considered and addressed. The school runs free coffee mornings to engage parents on fun courses.

The school wants to develop Learn Direct courses and on-line learning. However, it is recognised that child care facilities to support working mothers will need to be considered if this development is to move forward. It is also recognised that on-line courses are probably more ideally suited for those parents who have already done courses such as START.

In one START course, one group of parents produced story sacks. The group ran raffles and other activities to raise funds to run further sessions to produce story sacks. In another START course, parents developed their dialogue with their children (it is recognised that verbalising skills are generally low in the parent population). In terms of supporting verbalising further, the PDAs could play a major role, in that they will be able to be used to record dialogue – pupils will be able to say a story, then draft and redraft it.

The uses of the trial PDAs are intended to develop links beyond the school with the home and community. Some pupils have used the PDAs already – they used them to report the end of year sports day, and for taking pictures. They were able to use the voice recorders, and will be able to use these for field trips in the future. The PDAs allow email transfer by internet.

ICT in the future

The school is aware of a number of aspects that will support future ICT development and integration. The ICT co-ordinator intends to look at areas where there are missing curriculum pieces currently: in control and sensing, the possible use of Crystal Rain Forest for simulation purposes, and sensors that could work with the PDAs also. The ICT co-ordinator intends to look at how pupils are using ICT in each year group.

Developing uses of the PDAs will be a major project for the school. The school intends to integrate PDA uses with the overall pattern of ICT development (which is focused already on pupil uses and activities), and with the existing focus on parental and community development and involvement. The school has the opportunity to feed its experiences of PDA use into a wider LEA picture, and to gain from the experiences of other schools also. There are LEA-based working parties for the PDA initiative, one looking at software, for example, while another is looking at how the PDAs can be used when pupils record what they say.

Case Study 2: Considering e-learning activities across the school

Summary of key points from an e-learning perspective

1. The school is 3 form entry, and is run by a company as part of a private public finance initiative. The school building is only 2 years old.
2. The school is cabled throughout, and has 15 interactive whiteboards in year R to year 4 classrooms. All classrooms have a data projector and 1 or 2 computers, and there is a printer accessible for each year group. An ICT suite is timetabled for all classes except nursery classes.
3. Broadband access has led to increased teacher uses of on-line resources. A cache facility has also supported access.
4. The ICT resources available are used by teachers in ways appropriate to particular year groups. All curriculum planning sheets indicate where ICT is to be used. Classes make use of the ICT suite, as well as their own classroom-based resources. Some teachers are finding that the interactive whiteboard is enabling some activities to be undertaken by pupils at a younger age, and that learning is being enhanced by the visual approach, which in turn supports memorisation.
5. Teachers use resources such as a Roamer, as well as wide ranges of on-line resources and software. Espresso has been used with foundation years particularly, Learn Premium with Key Stage 2 pupils, and Spark Island and Education City have supported classes more generally.
6. Communication with email has increased, both across the school and with LEA services. No use of video conferencing has been undertaken at this stage.
7. Pupils are able to describe their uses of a wide range of resources, including programmable toys, on-line games, interactive whiteboard resources, internet information resources, spreadsheets, a control program, and generic software such as MS Word.
8. Links to parents involving ICT have not been explored at this stage. Some 40% of pupils have access to a computer at home.

School background

The school has 3 form entry. A new building was completed 2 years ago. The school is run by a commercial company; the school is an example of a private public finance initiative (PPFI).

ICT background

The ICT co-ordinator was consulted on ICT aspects when the school was being rebuilt. The only aspect that she feels she would do differently, in retrospect, is the placing of the interactive whiteboards. In some rooms these have had to be placed at a height above that of the trunking, which makes them less accessible than would be ideal. Where possible, interactive whiteboards are set at a height to enable easy pupil access.

The school is cabled throughout, in all classrooms. The ICT co-ordinator finds the involvement of RM to be particularly helpful, and she finds that this contrasts positively with experiences in her previous school and LEA. There are 15 interactive whiteboards across the school, in year R to year 4 classrooms. All classrooms have a data projector, each classroom has 1 or 2 computers, and there is one printer per year group. Video playing machines are connected to the interactive whiteboards, so that videos can be

played on a large screen. There is an ICT room in the school, and this is timetabled - 2 sessions lasting half an hour for each Key Stage 1 class, and a one hour session for each Key Stage 2 class. There is no use of the ICT suite by nursery classes.

ICT and the curriculum

The resources available are used extensively by teachers, and are used in ways appropriate to the needs of particular year groups. In a year 1 lesson, for example, a word bank activity was used to link aspects of science and literacy. In the lesson, some of the class went to the ICT room, while other pupils (19 in total) remained in the classroom. In the ICT suite, the teacher explained what pupils would be doing - accessing an internet site and writing sentences. The internet site linked to Clicker 4, which allowed words to be selected and these were used in sequence to make sentences. The teacher put up 'Plants need chocolate and chips to grow' as an example sentence - pupils challenged this, and made their own suggestions. The teacher restated what needed to be done. Pupils worked individually to make sentences. Later in the session, the pupils were asked to include 'My' to make a sentence. This time, rather than using the mouse to select words, they needed to use the keyboard to create 'My'.

In a year 2 lesson, the interactive whiteboard was used for a topic on 'variation' in science. The teacher said that this activity was a Key Stage 2 activity, but because of the interactive whiteboard, it could be done as a Key Stage 1 activity. Pupils used Textease, dragging animals onto a notepad area. They used the idea of 'branches', to group different animals. They needed to find a question to sort the animals into 2 groups. Only on the third attempt did a pupil give a question that could be used to group the animals into two groups at the first branch, 'Which one has a long trunk?'. A pupil dragged the animals into the appropriate boxes. At the second branch, a question that could be used was given on the second attempt, 'Which one has four legs?'. A pupil dragged the animals into the appropriate boxes. At the third branch, a question that could be used was given on the fourth attempt, 'Which one has paws?'. The activity was then repeated in the same way. This time, questions that could be used were stated by pupils on their first attempts at each branch. The teacher felt that the more effective responses were due to learning that had been facilitated by the interactive whiteboard. She said that she had found it possible using the facilities to do things that could not be done in any other way.

In another year 2 activity, a Roamer was used on a mat with an island map on it. The objectives of the lessons were concerned with control. Pupils attempted to programme the Roamer, but sometimes it did not end up in the places intended. The teacher asked pupils to try to find ways to correct the directions taken. A great deal of discussion on direction was generated by the use of this resource.

In a year 4 lesson, web sites were accessed that enabled pupils to 'tour a church'. Two sites were visited. The teacher asked questions about the resources as they were seen, and pupils answered these questions. When the ICT resources had been used, pupils returned to their places to complete a sheet on 'things seen in the church'. The teacher asked pupils to put the date on the sheet, then the learning objective (L.O.), and then to complete the sections that asked them about 'the value of items in a church'.

Experiences with broadband access

The school has not encountered any issues with regard to broadband access. The effect of broadband access has been to increase the use of internet access by teachers. A cache has

helped with access also. Communication resources such as video conferencing have not been used at this stage, but email has been used a great deal by teachers, both across the school and with LEA services.

Ways of using ICT in literacy and numeracy are now to be found on the LEA Grid for Learning. All subject and curriculum planning sheets in the school indicate how ICT will be used in lessons. As a consequence of ICT being used, teachers are indicating that pupils are contributing more, and are more involved. Because pupils interact with the resources more and do things more actively, teachers feel it is possible to see if and when they do not understand something.

Broadband access and content

The school has a constant broadband access. The cache has been useful in supporting access. The school has access to a range of on-line resources: Espresso (which has been particularly useful for foundation years), Spark Island, Education City, and Learn Premium (which has been used more by Key Stage 2 pupils).

Pupil uses of ICT

A range of pupils talked about their uses of ICT. Pupils in year 1 talked about the use of words with pictures, a game that involved choosing consonants, and how they moved diagrams to create sequences. They also talked about times table work in numeracy, and word games in literacy. They talked about how they programmed moving toys, and how they had to decide where they would move to.

Pupils in year 2 talked about the use of the interactive whiteboard in providing information in both visual and textual forms, for example, about how to make compost, and what is needed to grow plants. They talked about mathematics activities on the interactive whiteboard, and how games could be played by dragging and clicking. They talked about how easy it was to use Easiteach. Pupils in year 4 also talked about playing games in mathematics on the interactive whiteboard.

Pupils in year 5 talked about uses of spreadsheets, and how to calculate prices of meals, for example. They also talked about the use of a control program, Logicator. They indicated that the use of the interactive whiteboard in science enabled them to understand some topics more easily, because these were shown in diagrammatic form. They talked about how easy it was to gather survey information, and the ease of creating a questionnaire. They talked about how poems could be read out when they were clicked on, so that the rhythm could be heard, and that the poem could then be understood more easily. They talked about using MS Word and Colour Magic to create plans. They talked about games they played in numeracy, about using the internet for literacy and numeracy, and for finding information in art (such as examples of different hats), and in design and technology (such as how to make a biscuit). They talked about the use of Learn Premium in literacy.

Links to uses beyond the school

It has been found that about 40% of pupils have access to a computer at home, so links involving ICT with home have not been pursued at this stage. Email to parents is not used, but a newsletter is produced and sent home each week.

Case Study 3: Developing use of a teaching environment across an LEA

Summary of key points from an e-learning perspective

1. A number of schools in an LEA have been involved in a trial of an on-line teaching and learning environment called Gradepoint.
2. The system works through an audio system, but the teacher can also offer texts, images, MS PowerPoint presentations, web pages, and web cam access for pupils to view on screen. Pupils respond through text, by annotating screens, and by responding to active choices on screen. The teacher can pass a microphone to a pupil in a class to gain a verbal response, and 2 or 3 members of a class can share a microphone (although only a few instances of this form of use have been observed). The system does not rely upon a video conferencing link.
3. Pupils have used school ICT suites and computers at home to access lessons that have been run. Home access by pupils has involved both use of resources after lessons, and involvement in live lessons when they are absent from school.
4. Lessons using Gradepoint have been run in a number of subjects, to support a number of courses at different levels.
5. Involvement by teachers has in part been due to the reliability and quality of the broadband infrastructure. Broadband access ensures that on screen resources are of high quality, that they run quickly, and that audio transfer is of high quality.
6. Teachers have reported benefits from use of this system. Access to images, use of ranges of resources, and access to lesson materials by pupils at home and when absent have all been reported as benefits.
7. There are key features that determine how pupils will gain successfully from uses of the system. Resources that have a high definition on screen, use of resources to aid pace, speaking to maintain enthusiasm and interest, using text responses to engage discussion rather than merely generating answers to questions, and picking up on those pupils not involved, are all key aspects. Successful use has been associated with features such as effective planning of lessons in advance, pupils being introduced at the outset of the lesson, clear aims being set, short time limits being set for responses to questions, effective use of ranges of different resources, using annotation to stimulate engagement, having text responses afterwards to include in essays or notes, and use of different 'rooms' to support differentiated activities.
8. Some pupils are enthusiastic about the use of Gradepoint, and recognise benefits to their learning. They refer to access to wide ranges of sources, being able to see the viewpoints of many other pupils, being encouraged to take part, embarrassment being reduced, discussion being more in depth, and resources being more useful than handouts. However, other pupils are not enthusiastic, and are concerned particularly about their lack of direct verbal contact with the teacher, and the lack of ability to physically 'put up their hands'.
9. Support and training for systems of this type should in the future cover aspects such as teacher speaking skills when there is no direct auditory feedback, setting and maintaining pace in lessons when pupils are not physically present, generating discussion through text responses, use of resources for review or reinforcement, access to resources beyond lessons, involving those who do not understand, and providing for those who have their 'hands up'.

School background

All schools in the LEA are linked to a broadband backbone. A number of the schools have been involved in piloting uses of a particular on-line system, called Gradepoint, which offers an on-line teaching and learning environment. A single teacher is able, via the system, to teach pupils simultaneously in a number of locations. The system works through an audio system, through which the teacher speaks, and those involved in the lesson listen via headphones. Responses are made in textual form, and everyone can see everyone else's responses. The teacher can provide resources in the form of texts, images, MS PowerPoint presentations, and links to web pages, for example. The teacher can discuss topics, and use the resources offered to gather responses in a range of ways. For example, those involved might need to give a text response, or use the cursor to draw or annotate 'on screen', or select from a list of choices. The pace of the lesson is supported through the variety of media that the teacher has available.

Use of the system has been developed with primary as well as secondary schools, with adult learners and with the education other than at school (EOTAS) service. Use of the system has also been trialled with pupils in schools that are outside the country. One project was run for primary schools that involved training a group of students from Spain. The students, who came from the Zamora Institution of Education, were trained in the LEA. A set of lessons was developed that could be delivered to year 4 and 5 pupils in the schools in the LEA in which they were working. The primary pupils indicated that they very much enjoyed on-line learning, and were not shy when it came to using a microphone. The intention was that the students would continue to run lessons when they returned to Spain. A number of lessons were run, which involved pupils in schools in the LEA as well as pupils in schools in Spain.

ICT background

The environments in which pupils work in these sessions have varied. A lesson in one school, which involved 5 boys and 14 girls, was run in a computer suite, for example. The computers were arranged in banks, with some space around the workstations for writing, but the room was fairly crowded, although it was air conditioned. By contrast, another lesson involved a teacher in one school location, with 11 other 'students' involved, 5 at an LEA Centre, and 6 at other locations. The system works without it needing to rely upon video, but not just on textual communication either, as a teacher can pass a microphone to a pupil in a class so that the pupil can, for example, explain a problem that has been encountered. However, this microphone facility has not been extensively used, often because pupils become shy when using this medium (and that includes adult learners). A lot of use of a microphone facility could also potentially slow down the pace of a lesson. There is a new feature of the Gradepoint system being developed where members of a class can take part in a 2 or 3 way conversation – but use of this facility requires some skill to ensure that the pupils involved are not all talking at the same time.

ICT and the curriculum

Gradepoint lessons have been run in a number of subjects, and to support a variety of courses. For example, the table following shows the lessons run during the spring term 2004.

Subject	Course level	Topics covered
English	AS level	Philip Larkin Poetry
English	GCSE	Poets from Anthology
French	GCSE accelerated group	Poetry lesson as basis for coursework
French	GCSE accelerated group	In preparation for the spring term, a lesson on Corsica, and lessons on occupations
ICT	A level	A selection of lessons
ICT	Entry level	Introductory lessons
ICT	European computer driving licence (ECDL)	Modules 1 and 2
Mathematics	GCSE accelerated group	
Spanish	KS2 MFL project	Series of lessons
PSHE		Lessons to build confidence
Sociology	AS level	Unit 3 coursework

The system enables a teacher to run a lesson via an on-line environment, where some pupils may be present within the teacher's room, while others are in a more distant location. In one year 9 lesson, some pupils were in a hospital school, some were in a pregnancy unit, and others in a medical recovery unit. Whatever the grouping involved, experience has shown that there is a critical need for lessons to be created in advance.

When logging into the system, the tutor can select a number of parameters, which determine features of the session and how it can be run. For example, in one lesson, a teacher selected an audio and slide show, selected the subject, and selected the elements to be used, but turned off the pupil annotation feature. The slides for the session were loaded up, and a green light was shown when these were active. The slides offered pointers about how to undertake coursework, on how and what to write. This session was the fourth session of four on aspects of coursework. The slides on the system remained in an archive for pupils to access later. Pupils worked with individual headphones – and in this school they were numbered for each of the 24 individual pupils.

Experiences with broadband access

Teachers have been willing to pilot Gradepoint in part because of their increasingly positive experiences with broadband access. Performance is recognised as reliable, and it is recognised that earlier technical issues have been resolved. It is known that network issues can arise, but teachers know that these are resolved fairly quickly.

Broadband access and content

The access to images via broadband has been felt to offer an enhanced learning potential. The reasons for using Gradepoint have varied, but teachers have reported that the use of images, slides that reinforce key points, and materials that can be referred to more often than handouts, are all seen as being positively beneficial. Pupils are able to access archive material, and the system provides this archive facility integrally. In some cases, it is found that perhaps 25% of a class will access material at home regularly, after it has been used in lessons through Gradepoint. Pupils also access material when they are absent, and lessons can involve the same group of pupils even though some might be at home or located in different distant locations.

There are key aspects that determine pupil ease of use of the system, and some are defined to an extent by the bandwidth available. Definition on screen is important, as blurred text and images can be off-putting. Pace is particularly important, so use of a

variety of resources can aid pace. The audio aspects are particularly important. The teacher needs to speak with enthusiasm. Teachers that comment on how well pupils are responding helps to maintain pace and involvement. Teachers maintain engagement by generating discussion with text responses, rather than merely providing questions that have to be answered. Use of text responses to generate discussion maintains an increased pace and interest in lessons. Asking questions rather than generating 'discussion' reduces interest and a focus on learning. The responses provided by pupils are shown against their names, so the teacher can identify those not involved. If pupils encounter problems, they can 'request the mic' – which is an equivalent of them putting their hands up. But experience has shown that when a teacher passes the microphone they usually do not then want to speak. There is also a 'whisper' function, so a pupil could 'whisper' to the teacher to say that they did not understand, for example. But experience shows that this facility is used mainly when pupils want to whisper to one another.

Pupil uses of ICT

Some pupils have been particularly enthusiastic about the use of Gradepoint. For example, an English lesson about poetry was run for year 12 students by a teacher who was experienced in the use of this medium (having been involved in its use since October 2002). The pupils indicated to the teacher a range of benefits that they felt had arisen from use of the Gradepoint system:

- By looking at the slides and the web-site references, and by seeing other sources, it was possible to get a wide overview of the poem.
- It was possible to see everyone's views more easily.
- It was possible to undertake a systematic analysis.
- Questions could be answered in a way that helped even if you felt shy.
- More pupils were involved because it was a written rather than a verbal response.
- Embarrassment was reduced, so more questions were asked by pupils.
- Images would not be provided in the same way in books.
- Leading questions from the tutor meant that thinking was stimulated.
- The depth of discussion was enhanced, and pupil responses were more considered.
- Timed questions encouraged more rapid thinking.

However, not all pupils respond in the same way to this medium. In one lesson observed, for example, pupils did not focus well in the lesson, they chatted to each other about their weekend social activities, or used email, or even mobile telephones. Indeed, part of the Gradepoint system encouraged general social discussion between pupils, rather than keeping them on task.

In spite of this lack of focus by many pupils, some pupils still said that they preferred using Gradepoint to having lessons in classrooms run in a more traditional way. For example, one pupil said that she benefited from seeing the slides as well as hearing about them, that handouts were filed when Gradepoint was used, that she tended to look at the slides more than the handouts, and that the slides were more focused (as they offered specific points, while there was usually more text in a handout). Another pupil, however, said that Gradepoint was not useful, that it was hard to understand when using the system, that there was not enough interaction, that he could not speak to the teacher, and that points were not explained enough.

Successful use of the Gradepoint system by teachers was associated with certain key points:

- The teacher introduced all the pupils involved at the outset of the lesson.
- Clear aims were set at the beginning of the lesson. Knowing at the outset that pupils would be assessed on their levels of involvement was important.
- Pace is set early, and although pupils may have little time initially for answering questions or responding to voice requests via text, within short time periods responding to questions becomes easier as engagement increases.
- The range of resources offered within a lesson by the teacher is important. Use of internet resources, maps, views from web cams, images and text can all be involved, and this range can stimulate engagement.
- The facility allows slides to be annotated, which enables pupils to view the actions of others, and can stimulate engagement.
- Resolution and definition of resources on screen was an important factor, and the teacher needed to choose clear resources.
- Many resources were introduced for fairly short periods of times, which added to the pace of a lesson.
- Text responses generated by pupils could be used afterwards for inclusion within longer texts such as essays.
- Text responses allowed for a discourse with others, without the problem of pupil responses being 'spoken over'.
- Pupils of different abilities could be assigned different tasks and they could work in different 'rooms', which helped with differentiation.

Links to uses beyond the school

Pupils can access the system from home. Many pupils have accessed the resources that are archived in the system. Some pupils have cable access at home, and they have logged in to lessons when they have been absent from school. Pupils can in this way continue to work with a group even though they may not be physically present.

ICT in the future

Teachers have stated that they can identify the ability of pupils more quickly by using this system. However, it is clear that this can only happen when pupils are engaged in discussion, so that the teacher can assess both contribution and response. Assessing the level and quality of answers to questions and the level of being involved is an integral part of the teacher's role. Initially in a lesson that is set with high pace, pupils have little time for answering via text, but pupils can soon pick up the pace of the lesson, and the use of time limits can sharpen the pace of the lesson. Resources such as those provided via a web cam can be introduced into a lesson, and slides can be annotated. Internet screens can be brought up, and it is possible for pupils to use a 'respond' button in response to items that they see and work on. It is possible to retain screens and then to access different screens from the bottom bar. Text responses from both the teacher and pupils can be retained, and it is possible to incorporate these into an essay, for example. Interesting asides can arise in a text discourse, and these can be used by the teacher to stimulate discussion on a related topic.

The LEA has launched a full roll out of an ECDL programme, as the pilot was very successful, and Gradepoint is being used to deliver this. This roll out involves something like 360 learners participating in about 32 broadcasts each week. Pupils involved have

ranged from year 9 to year 12, and the courses have also involved a home learner, and adult learners from primary, special and secondary schools. Adult learners have included education assistants, teachers, and administration officers. The first group of students to take the course were year 11 gifted and talented accelerated learners. They took the first module tests (on-line) and achieved a 100% pass rate. They were fast tracked through the modules in the time freed up by taking some GCSEs early. They did not have an ICT qualification, and this stimulated their interest in this course. They were reported to have enjoyed the on-line learning environment and also made use of the bank of resources that Gradepoint set up for each module for learning outside of class.

The success of this type of on-line environment is likely to depend on a number of factors:

- Teachers running lessons need to rely very largely upon their verbal skills in generating involvement and interest, without their being able to see direct feedback always from pupils. Teachers need to speak with enthusiasm and interest even though they do not necessarily have a class in front of them, or any auditory feedback.
- Setting a pace to the lesson, and maintaining pace through use of a variety of resources is a key need.
- Using text responses helps to engage pupils widely. Teachers need to encourage not only responses to questions, but also to add text for discussion.
- This form of distant interactive lesson does not rely upon the use of video. It has been found that video conferencing can be intimidating to some pupils, while they take more quickly to this form of medium.
- The ICT capability and typing speed of pupils may be a factor of importance.
- Lessons can be archived and can enable pupils to review and work through the resources afterwards.
- Lessons so far have been used largely for extension purposes, rather than offering core lessons within courses. Extension or enhancement lessons can be run during school or out of school time.
- Numbers of pupils do not limit use, but can determine the type of lesson that can be run.
- Pupils who do not understand a topic or aspect can look for other stimulation, and may be distracted when they use this system.
- The facility where pupils can privately chat to each other can be distractive, and should be disabled when teachers feel this might happen.
- Facilities to support those pupils who have their 'hands up' because they do not understand or want more explanation, should be explored more.
- Because the use of this environment offers less direct feedback to the teacher, there are likely to be significant training implications.

Case Study 4: E-learning using video-conferencing in a school cluster

Summary of key points from an e-learning perspective

1. The head teacher and deputy head teacher have strongly supported the integration of ICT across the school, and the development of e-learning activities for pupils and teachers.
2. Pupil home access to ICT has been found to have risen significantly over the past 2 years, and it is recognised that pupils are beginning to use ranges of ICT at home to support learning.
3. E-learning activities have been supported by the collaborative endeavours of a network of schools, and by collaboration with and across the authority.
4. The work of a network of schools that are in similar circumstances has enabled activities to be developed that are important examples in terms of e-learning. For example, pupils work across the schools via video conference sessions, to support comprehension in areas of literacy.
5. E-learning activities that are classroom based have been developed through a separate deployment of equipment to that involving cross-school work.
6. Staff access to laptops has been an important means to support the development of teaching resource uses, but so too has the role of visitors and the need for teachers to 'rise to the occasion'.
7. The monitoring of ICT uses and e-learning activities have been integrated with regular classroom monitoring activity.
8. ICT has not been the only approach used by the school to focus on learning and teaching. Other focuses on teaching and learning have supported e-learning activity, for example, the role of 'big pictures' as part of the Accelerated Learning Scheme.
9. MS PowerPoint has been used as the medium to produce resources that support lesson planning and lesson activity generally.
10. Different ICT resources have been used to focus on different and particular aspects of learning. For example, the use of video has enabled a focus on investigation and questioning in science, while video conferencing has enabled a focus on comprehension aspects in literacy.
11. Teachers use a wide range of ICT resources, as well as creating their own resources for use with particular age groups of pupils. A classroom assistant supports teachers with the identification and capture of resources.
12. Broadband access has enabled teachers and pupils to use ICT resources regularly and confidently, including the use of facilities such as video conferencing.
13. Teachers have found that specific ICT resources have impacted positively upon the motivation, behaviour and attainment of individual pupils. Overall, SAT results have also been seen to improve over the past 5 years.
14. Pupils are aware of the wide range of ICT resources that they can access and use, and how these resources can support certain specific aspects of their learning and the learning of others. The benefits of ICT are being recognised by teachers and pupils, and these benefits are aiding a further focus on specific aspects of learning within the school.
15. Ranges of e-learning activities within the school are well established for teachers and pupils. E-learning activities beyond the school are developing, for both pupils and teachers.

16. The school is aware of aspects and issues that would support future development. The roles of progression and transition are recognised as being particularly important in this respect.

School background

This is a rural school, with 115 pupils on roll, taught in 4 classes. Some 60% of the pupils come from outside the immediate village area. The head teacher strongly supports ICT developments, and the deputy head teacher has been the ICT champion within the school. However, the role of champion is being reconsidered, as the deputy head teacher is moving to the LEA, to work on the 'hands-on support' initiative.

Pupil access to ICT at home is high. It was found from a recent school survey that there is a very high level of ICT access at home (more than 90% of homes have ICT access). The head teacher feels this level has changed over the past 2 years (that the level was perhaps at 40%, 2 years ago).

ICT background

Two key issues arose in 1998 regarding ICT development:

- The school became part of a new unitary authority.
- ICT was raised as a key issue in an Ofsted inspection, with the school having only 1 or 2 computers per classroom at that time.

Senior staff have reviewed the situation and the way in which ICT was developed from that point in time onwards. It was felt that the resolution of both concerns raised in 1998 had been addressed through a set of actions and activities that had in turn focused on each concern, but that had been both complementary and integrated. This form of integrated pattern of activities has been felt to be important in enabling the school to move on as it has done.

A key early action that set the scene for later positive development was the agreement of schools across the authority to pool resources to provide for the needs of broadband access. The school is a small rural school on the edge of the authority, and there was concern as to whether location would in any ways jeopardise broadband access. But the authority provided particular access to accommodate the needs of each of its schools in these circumstances. Important actions put in place at an early stage were: the forms of infrastructure provided; the effective help line available; and a network of 8 rural schools being established. Advantages arising from the working of the network of schools have been positively identified. The network of schools has run a number of joint professional development days, for example on creativity and on mathematics. The group of 8 small rural schools has enhanced the levels of sharing and discussion generally across the staff of the schools.

In terms of current ICT deployment, the school does not have a separate ICT suite. There is an interactive whiteboard and computers located in classroom areas (and these have been in place since about 2001). There is a resource area, with 4 machines, all with video conferencing facilities. The computers in the resource areas are set up with a whiteboard facility so that pupils can teach pupils in other schools, both via the whiteboard and the video conferencing facilities.

Most of the staff have been at the school for 5 years or more. All staff have access to laptops (and this provision was put in place before the national 'laptops for teachers' initiative was implemented). Teachers and support staff are now more confident with using ICT. Visitors have been felt to play a part in this development; it has been found that visitors are helpful overall in that they support confidence with staff - staff have got used to 'rising to the occasion'.

School managers have looked at how ICT has been involved in teaching and learning through the range of monitoring activities that have been in place and used regularly. School staff have reflected on the ways that ICT has been used, and have talked in staff meetings, for example, about appropriateness of ICT uses in teaching and learning.

ICT and the curriculum

ICT has been used to support teaching and learning, but has been integrated with other teaching and learning principles and initiatives that have also been adopted over the same time period. The school has looked at Alastair Smith's Accelerated Learning Scheme, for example, and has adopted approaches from that scheme to support teaching and learning approaches. Resources created in electronic form, using the principles that form the basis of the scheme, have been collected together on the school intranet. These resources are topic or subject collections, linked electronically, each starting with a wide overview of the curriculum area (the wide overviews are called 'big pictures'). For example, one 'big picture' shows the elements that contribute to the area of literacy, with the 'big picture' showing topic divisions into poetry, and active reading, for example. These elements are linked and displayed in the form of a mind map. A 'big picture' shows the range of topics that need to be covered in that curriculum area. Each one is produced in a MS PowerPoint presentation, and has links on the slides to other specific resources. Each one of these specific resources enables a lesson plan to be accessed (and each lesson plan follows a common structure). The common structure provides ideas or specific materials that cover:

- Targets.
- Warm-ups.
- Activities.
- Questions.
- Reviews.

All curriculum areas have been tackled in a similar way. Science, for example, is described in terms of topics that are displayed as a 'big picture'. Each sub-divided topic has its own MS PowerPoint presentation (with access to individual lessons through that presentation). Having an MS PowerPoint presentation for each topic area enables questions to be prepared in advance, so that ranges of questions are ready for use in the classroom. Lesson plan slides contain colour links and hyperlinks to other associated resources, for example, to the National Numeracy Strategy. The deputy head teacher has accumulated lessons that cover the entire needs for each day – providing a large bank of resources. The MS PowerPoint presentations have been recognised as being useful in a number of ways. Each MS PowerPoint presentation can be used to prepare lessons in advance, and for planning at a level of detail that looks at how to involve paired or group discussions, for example.

When starting a curriculum area in class, pupils use their own whiteboards and pens, and they can share their ideas through this medium. The deputy head teacher finds that he can access aspects of their learning by looking at the 'big pictures' that they each produce.

It has been found that ICT can support teaching and learning in other ways too. For example, it has supported experimental approaches and observations. Using digital video, for example, it has been possible to look closely at results of experiments, to question results more in depth, and to investigate more. Rather than having to maintain a strong focus on experimental procedures, more of a focus on investigation has been possible. Video recordings provide accurate records that do not rely upon inaccurate recollections. Video can be used to capture records of activity or incidents at road junctions or at trouble spots, for example. These captured records can then be rerun to investigate road problems and how they might be solved.

Teachers find that the ICT resources available to them can be used to match the needs of their pupils. In a year R and 1 class, the LEA resources available from the intranet are used, for example. Year 1 numeracy resources have been used to run main activities in lessons, for example. The resources can be annotated, and it has been possible to select particular starting points within the resources, such as starting at specific numbers with a specific group of pupils. Resources from the intranet have been used to enable pupils to work more on their own, and this has been found helpful with this age group. In a year 1 and 2 class, BBC resources have been used (such as Star Words). The resource packages from the LEA have been used to support numeracy lessons, but there has not been much found to support literacy, so these resources have tended not to be used as much. For history, BBC resources such as those on Florence Nightingale have been used. Some resources have been used for observation only, or have been used because of the interactive nature of the resources. There are facilities available so that pupils can see TV programmes or video on the same systems. It is felt that interactive whiteboards are supporting teaching and learning, because they present in a visual way so strongly. The auditory element can be added also, but this is not always felt to be useful (as the sound is not always clear). Search engines have also been used, particularly Google and Yahoo!igans. However, it has been found that there has been a need to account for reading age with facilities such as search engines. It has been suggested that there is a need for a useful on-line encyclopaedia to support the needs of age specific groups.

Teachers have created their own electronic resources for use in the classroom. For example, the year R and 1 teacher has made resources at home and has emailed them to school. She has scanned pages of a book to highlight key words. She has scanned in pictures, with words on them, so that pupils can point at them. She has made a paired word game of key words, adapted from other resources. She finds that the electronic resources keep pupils focused, and that they are more attentive when these resources are used. She finds that she can flip between things easily, and she can move more quickly between things so pupil attention is retained. She says that she can keep changing things, so pupils will not get bored. She finds that using electronic resources has been more efficient than using previous non-ICT resources. She feels that she can move onto aspects more quickly than she could before – that the interactive whiteboard has more impact and that pupils are more enthusiastic.

Teachers are supported in their uses of ICT through the work of a classroom assistant. She supports pupil uses of the ICT in the resource area. She also deals with aspects of trouble shooting, and any issues with access to the intranet. She enables local resources from the intranet to be accessible on the school computers. She undertakes resource searches, such as using Google to search for resources about specific artists. She usually

downloads the resources she finds, rather than putting them into a 'favourites' list. She seeks resources for teachers to use on specific topics, rather than creating a resource bank. Resources are handled electronically and printed off for lesson preparation purposes. Resource searches might take anything between 5 minutes to 1 hour per day, but are undertaken regularly. Some resources can be needed just before a lesson, and others can be needed in advance of a lesson (perhaps up to 2 weeks before). Some teachers find it easier for the classroom assistant to find resources rather than having to seek these for themselves. It is found that more teachers are now used to using search engine facilities. The classroom assistant finds that pupils find sites easily, but are not so good at being discerning about accuracy of information. She finds that year 6 pupils are more discerning than year 5 pupils.

Overall, it has been felt that ICT use has supported learning and teaching across the school, and it is felt that attainment has been enhanced as a consequence. SATs results have been seen to rise over a 5 year period.

Experiences with broadband access

Broadband performance has been found to be both reliable and useable. Teachers can access email from home, but have no access at home to software currently on the authority-wide network. Reliable broadband access has meant that the school has been able to use communication systems such as video conferencing regularly and with confidence.

Broadband access and content

Schools across the authority have pooled their e-learning credits to purchase software. A group of teachers and head teachers pooled ideas of what to purchase. Access to this software has been found to be an important source for the school. It has been particularly useful that software coming into school has been trawled already, refined and selected, so it is easier for teachers to use the resources available.

Pupil uses of ICT

The school has found that the uses of broadband technologies have had impacts upon individual pupils. A disaffected youngster last year ran home from school, but when he used video conferencing, it was found that he 'blossomed'. He achieved a level 4, which boosted his confidence, and this confidence fed positively into other aspects of his work. The level 4 in reading that he achieved was felt to be due to the forms of questions that he experienced when using the video conference system. The deputy head teacher believes that the style and format of video conferencing helps with 'comprehension', and this aspect of work has been felt to be difficult to support in other ways. This year a very shy girl has started to contribute as a direct result of her involvement with video conferencing.

Five year 6 pupils, 2 girls and 3 boys reported on their uses of ICT. They mentioned how they used Google to find information, and how they could narrow down a search. They mentioned the use of a control program, using pelican crossings and traffic lights, with delay sequences. They mentioned how the interactive whiteboard enabled everyone to see what was happening, and that colour helped them to remember more. They referred to the use of mind maps, and one girl said that she produced these individually at home. They said that the 'big pictures' were helpful, in terms of aiding memorisation, that colours connected with specific aspects of subjects helped them to connect to previous work they had done, and they could review more easily those things they were not sure about. They

reported how they used mind maps to select topics to concentrate on in booster sessions, for example. They mentioned how they used video cameras to teach other pupils in other schools, that those pupils posed them questions, and if they could teach them, then they were confident that they knew and could understand the topic. They mentioned how they had produced a MS PowerPoint presentation to explain a topic to the other pupils. They mentioned the wide range of resources they had access to, including Kar2ouche, art programs, email access with other schools, laptop facilities to show materials on the interactive whiteboard, video cameras to record science experiments, video conferencing in a mathematics club, preparation for SATs using web-sites, and the use of search engines (as well as the resources mentioned above). These pupils agreed that uses of ICT were allowing them to 'take more in', as they did not 'have to listen all the time'.

Links to uses beyond the school

Some links that have involved uses of technology to support learning beyond the school have been developed and encouraged at this stage. Video conferencing has been used effectively on a number of occasions to support learning interactions between schools using Polyspan equipment. The equipment has been used every week, when the school runs a video conference with another school in the authority. In one activity, pupils had to write a book abstract, and other pupils had to ask questions about the book and the abstract. Video conferencing was used to enable pupils to pose questions of other pupils. This was felt to support comprehension particularly. Other activities via video conferencing have involved pupils in debates, on topics such as whether animals should be kept in zoos. It has been found that the video conference medium brings a strong sense of audience to pupils.

ICT in the future

The school recognises that progression is a continuing issue. Although it is known that some aspects have been resolved, it is also recognised that other aspects have yet to be addressed. With the very wide range of resources that pupils experience, and the regularity of access and use that pupils make of the resources, it is recognised that there are transition issues, and that secondary schools may not be able to offer the same forms of access and use at this stage.

The benefits of broadband access are well recognised by staff, and having home broadband access for staff is felt to be an urgent need. It is also recognised that new MS operating systems will enable a greater integration of resources, of digital video, for example, which will support those aspects that the school would want to explore further in the near future.

Case Study 5: E-learning across the school moving into home use

Summary of key points from an e-learning perspective

1. The head teacher has taken a key strategic lead with regard to ICT developments across the school. A high investment in hardware and software has been coupled with high levels of staff training and review. The ICT co-ordinator has a key curriculum role.
2. There is an ICT suite, which is allocated for use by each class on a timetable basis, in blocks of 3 periods for 3 weeks, so that classes can undertake project work.
3. Each classroom has an interactive whiteboard, and teachers save work electronically. Classes have access to shared clusters of computers also.
4. The QCA schemes of work are followed throughout the school. Pupils experience a wide range of software, including email, Flowol, Logo, and Mind Manager. ICT has been integrated into subject areas widely.
5. Impacts of the interactive whiteboards are being recognised by teachers and pupils. A more dynamic approach, being able to vary strategies, being able to involve pupils more, ease of editing, use of highlighting facilities, and being able to engage pupils from the start of a lesson, all feature as recognised benefits. Pupils experience a wide range of uses of interactive whiteboards, including uses outside 'standard lesson uses' such as the taking of registers, and playing word or spelling games.
6. Many teachers write directly on the interactive whiteboards. It is felt that the size of letters and the way that lighting shows them up, help pupils to see how words are written.
7. Communication facilities have enhanced the abilities of teachers to share their planning.
8. Pupils in year 6 are aware of a range of programs, and understand how individual programs can support their learning needs. Some pupils are beginning to use ICT at home to extend their learning. Some pupils are recognising how on-line resources can support revision needs.
9. Teachers are starting to use email to support their planning, and to enable pupils to send them homework.
10. The school is aware of some specific areas where further support would enhance ICT development. The school is now at the point where the impact of interactive whiteboards on pupils from year R could be tracked longitudinally.

School background

The head teacher has been at the school for the past 2 years. The school is organised into 12 classes. These classes are grouped into 3 wings – a wing with year R and 1 classes, a wing with year 2 to 6 classes, and a wing with year 3 to 6 classes.

ICT background

During the past 2 years, ICT has been developed significantly across the school. The head teacher has taken a strategic role in this development. There has been a high level of investment in hardware and software resources, as well as in staff training. Staff training has been run through staff meetings and workshops, and has offered support to teaching assistants as well as teachers. Staff training support was provided from the LEA. Since the start of the ICT development programme, 12 new staff have been appointed. Day to day ICT curriculum responsibility lies with an ICT co-ordinator.

The school has an ICT suite, with an interactive whiteboard, a ceiling mounted projector, and 14 networked machines. The central ICT suite is allocated for class use on a timetable basis. Key Stage 1 classes have three periods per week for a period of 3 weeks (and each class could have another period additionally). Key Stage 2 classes have the same access to the ICT suite - each class has a block of 3 periods for 3 weeks. It is felt that this block of time enables a concentration of access so that teachers and pupils can undertake projects within this time.

There is an interactive whiteboard in every classroom, with some central computer resources available in each wing. There are 2 machines for central use in one wing, 2 in another wing, and 3 networked laptops and 3 networked machines for central use in the third wing. Static whiteboards are being removed from classroom areas, and teachers are now saving electronically all work done in lessons. Cambridge interactive whiteboards were chosen, as it was possible to write on these with a whiteboard pen.

ICT and the curriculum

The ICT co-ordinator believes that the interactive whiteboard has introduced innovative approaches to teaching and learning. She feels that it offers a more dynamic approach, that strategies can be varied more, and it is possible to involve pupils more in doing things actively. She finds it is easy to edit work, and that highlighting facilities help. She finds it is possible to engage pupils right from the start of a lesson when using an interactive whiteboard.

Observations of uses of the interactive whiteboards across the school during a half day visit illustrated these points. In a year R class, the interactive whiteboard was used to take a dinner register, as well as a regular register (pupils become familiar with their own names in this way). In another year R class, the interactive whiteboard was used for a partitioning activity in a numeracy session. Pupils were writing on the interactive whiteboard, putting smiley faces into a bath. In a year 1 class the interactive whiteboard had word lists on it, so that pupils could point words out as requested. In a year 2 class, the interactive whiteboard was used for playing a game during a break in a SAT session (a spelling game, which was scored on the interactive whiteboard). In a year 3 class, the use of the interactive whiteboard was for a multiplication and division activity. In a year 3 and 4 class, the interactive whiteboard was used for mind mapping. Pupils could see previous topics they had covered. The mind maps could be printed and photocopied for pupils. The teacher said that the interactive whiteboard allowed things to be moved, for sound to be used, or enabled a run through of a simulation prior to pupils using it.

Although some resources are used by teachers on the interactive whiteboards, a great deal of use involves work being hand written by teachers. The head teacher believes that the size of words, and the way that the lighting shows them up, helps pupils to see how words are written. Teachers save interactive whiteboard work, and this provides evidence for Ofsted needs.

Teachers and pupils use a wide range of software. Mind Manager is used a great deal, and this is linked to the Accelerated Learning work being undertaken across the school. Teachers have been on an Accelerated Learning course – and both teachers and pupils produce mind maps. In a year 2 class, Logo was being used to show how to use the editor

and how to give commands, and run sequences. In a year 5 and 6 class, a control program Flowol was being used to look at the control of traffic lights.

The school follows the QCA schemes of work throughout. Subject schemes of work show the links in each subject topic to the ICT that is used. Displays around the school show that there is a wide integration of ICT into many subject areas - music, art, design and technology, numeracy, and literacy. Integration is supported through encouraging a sharing of ideas. Teachers exchange views in staff meetings. Monitoring is done in a range of ways. The ICT co-ordinator has put a figure on the level of ICT used in lessons. Integration has developed to the point where the head teachers says that pupils ask to use the ICT that is available.

Experiences with broadband access

The school has had positive experiences with broadband access.

Broadband access and content

Software and resources that are required are generally found on-line on the authority intranet. The school is not able to put its own software onto the network, but peripherals can be plugged in. The school has not been involved so far with uses of video conferencing. The communication facilities available have supported teachers in sharing their planning more easily.

Pupil uses of ICT

Teachers are reporting that pupils are able to adopt new ways of learning when using ICT. In particular, it is possible to model mistakes, as things are so easy to change. The use of ICT is found to link well with the approaches adopted by the Accelerated Learning Scheme. For example, a picture is found on the internet, pupils look at it, think about the features they need to remember, and then recall it while the register is being taken. They then review the processes they have been through and what they have done. The use of formats in an ICT medium also supports learning, such as the use of a story planning tool. Teachers also find that they can ask pupils to work in other ways. For example, pupils can be asked to draw a graph quickly on the basis of results observed from a simulation.

Six year 6 pupils, 3 boys and 3 girls, talked about their favourite work and their best work using ICT. Their responses are shown below.

Girl 1	Said that a presentation using MS PowerPoint in science was her best work. She took a video of convection, and put it into the presentation. She used the program at home as well as occasionally at school. She used animation features as it “attracts reader's attention”. She said the spell check helped.
Boy 1	Said that Flowol was his favourite program. He said the interactive whiteboard was “fun”, but that it sometimes needed calibrating and then the pen was annoying.
Girl 2	She said she liked the editing facility in MS Paint. She had used the rotation facility, and had files of art that she had done at home. She had created a folder cover in MS Paint, and had pasted it into Word. She said it was easier to learn and to see things when the interactive whiteboard was used, and that things were explained more.
Boy 2	Said he enjoyed using internet access to Learn Science (learn.co.uk), which showed experiments. He found this useful for revision. He had also used Visual Science. He had started to produce a spreadsheet of homework handed in, with results. He had also used a record of National Curriculum ICT skills attained and the levels gained to show these in the form of a profile as a graph.
Girl 3	Said she liked MS PowerPoint for presentation, especially the animation features. She had found pictures and information from the internet, and had created sheets of information in her own words. She started a biography of Alexander the Great, and there was a folder of her own work on the school web-site. She created a newspaper, 4 pages long, with a feature on John Travolta, created as an interview report from internet information. She said that teachers found it easier to access things when using the interactive whiteboard. She had emailed homework home to complete it. The teacher had accepted homework by email. She said sending homework via email was useful as homework could be completed more easily this way and she did not forget it.
Boy 3	Said his favourite program was Flowol. He had put a MS PowerPoint presentation of the planets together, using animated clips from the Clip Art gallery on the computers.

Links to uses beyond the school

Teachers are exploring uses of electronic links beyond the school. For example, a year 4 teacher drew down a weekly plan via email, sent from home.

Pupils are already using ICT beyond the school, and pupils are seeing links between the work they are doing at school, and the work they can do at home. The school is aware that 50-60% of pupils have internet access at home. All new housing in the area will have broadband access, and this will facilitate further the ways in which pupils work could be supported. The school is putting together its own web-site.

ICT in the future

The school is aware of some specific areas where further support would be valued in terms of its continued ICT development. For example, developing the use of Flowol for control activities.

It is also clear that the school has now deployed ICT in ways to enable certain impacts to be tracked for the first time. For example, year R pupils in the school will be the first pupils to experience interactive whiteboard use throughout their time in school. This could provide a valuable opportunity for tracking the impact of this technology on a long term basis.

Case Study 6: E-learning supporting secondary school subject needs

Summary of key points from an e-learning perspective

1. The school serves a wide catchment area, and provides for an 11 to 16 year old age range.
2. ICT has been integrated into the curriculum and developed through a range of initiatives in the school over a period of many years, and the development has been strongly led by the head teacher. A curriculum approach has been adopted in the school to enable project and extended forms of working to be possible through a 'Flexible Fridays' programme.
3. The school is concerned that future needs of pupils are met, and that up-to-date ICT facilities and resources should be integrated within current curriculum practice if this is to be the case.
4. A year 10 course to address the media literacy needs of pupils is being developed, called 'Medionics', which involves aspects of media related to music and fine art with ICT. Industrial standard software to handle the media needs in these areas is accessible to pupils. Assessment and accreditation of this course is an issue, but industrial involvement could provide a positive way forward in this respect.
5. Business studies and ICT courses are increasingly using on-line resources and courses to support teaching and learning. Pupils are being encouraged to produce e-portfolios as evidence of work completed, and to manage ongoing work. Some indicators suggest that uses of on-line courses could be enhancing pupil attainment. Teachers believe that pupils are taking more control of their learning through using an on-line environment.
6. A group of business studies pupils have been involved in an accelerated learning week, and have taken a GCSE a year early. The trial suggested that this form of learning could support a range of pupils of widely different abilities in terms of literacy and numeracy.
7. In English, use of video reconstruction is enabling pupils to demonstrate aspects of the subject that could not otherwise be demonstrated. This form of outcome could be used to extend the range of understanding that could be brought to this age group.
8. A virtual learning environment is being developed so that portfolios of work in subject areas can be managed by pupils across three secondary schools, and then transferred seamlessly to the tertiary college. Teachers can create learning modules, pupils can work on activities at home as well as in school, can save their work, change it, or submit it for assessment purposes.
9. Each of the e-learning initiatives described in this case study offer valuable potential opportunities for pupils. A challenge for the future is likely to be concerned with how the different initiatives might support different pupils or groups of pupils. Managing the ways in which any pupils might benefit from these initiatives, and how current alternative approaches could still be used to meet the different needs of different groups of pupils, would then form the basis of a further integration of these initiatives into wider practice.

School background

The school provides for the 11 to 16 year old age range.

ICT background

ICT has been strongly led for some years by the head teacher, and the school has been involved in a range of ICT initiatives over a number of years. The school has adopted a timetable that alters the focus of how the curriculum is handled. By working to a 'Flexible Fridays' programme, project style and other extended forms of work that do not lend themselves to a lesson timetable can be undertaken on Fridays. The school is concerned that pupils experience a curriculum that offers them the means to meet the demands of society and work when they leave the school.

ICT and the curriculum

The school has sought to provide courses for pupils that meet their future needs, and has been concerned that courses integrate ICT in ways that meet those needs. In seeking to address this need, the school has developed a new course, concerned with integrating aspects of media studies (through music and fine art) with ICT (called 'Medionics'). This is a year 10 course, with links to the local FE college. The course involves pupils in taking 3 lessons of 40 minutes duration each week; it involves some after school time, and on some occasions time in the 'Flexible Fridays' programme.

Pupils had indicated to staff previously that they had used ICT in only limited ways in art and music, and the means to address this issue was part of the idea behind the origin of the 'Medionics' course. This course could also offer a way in which there could be a greater curriculum emphasis for pupils on media literacy. The need for a greater emphasis is certainly likely to become increasingly recognised, as uses of ICT become more concerned and integrated with elements of ICT-based media accessed via the internet, and digital radio and television.

Two teachers are involved in running the course – a music teacher and a fine arts teacher. A technician, and an advisory teacher support the course. The course is run in the school's Apple Centre. The Apple Centre provides access to desktop machines, laptops (maintained in a separate cabinet), an interactive whiteboard and data projector. Teachers are producing their own resources to run the course. The course structure and outcomes are intended to lead to the production by pupils of e-portfolios.

In a lesson observed, a year 10 pupil on the course was putting a Kandinsky painting into a program to ultimately animate it in Flash. He was using a tablet to put elements of the painting into electronic form, and had to save different layers - one colour for one layer. He was putting elements into layers in Photoshop, but the animation was to be done in Flash. The purpose was to experience the way in which digital art is handled in the industry. He found it took a couple of weeks to get used to the Apple technology that he was using.

The course is at an embryonic stage, and the teachers are at the stage of taking new elements and ideas on board as aspects emerge, such as the need to integrate new software, for example. The course is working towards an integration of media literacy handling, using a range of industrial standard software, so that pupils can develop work that uses animation approaches integrated with music, for example. Pupils can access and use a great deal of powerful software, the sound aspects are created in Beacon software, for example, and SoundBeam software can generate a light beam to interact with.

Assessment and accreditation is an issue for the course, and the school is exploring how course outcomes can be accredited. The fine arts teacher finds there is high resistance to this form of course. He finds there are issues concerned with accreditation, especially where the course is mainly software-based. Issues of software upgrading and integration are also raised. The head teacher believes that the industry has to be involved with both delivery and accreditation. There are clearly parallels here with the work of the IT Academies programme. The school is likely to work in the future with 2 other secondary schools and a local FE college to become a Cisco Academy. This present course might also benefit in the future if Apple or Macromedia were to become involved in courses run through an IT Academies programme.

Other subject areas in the school are seeking to enhance subject teaching and learning through a greater involvement with an on-line environment. Business studies and ICT have started to explore the uses of virtual learning environments in this respect. The Applied Business Studies course has involved e-learning this year by supporting teaching and learning through the Business Education web site, and ICT is looking to accredit aspects of ICT through use of the Edexcel web-site.

Business studies and ICT courses have 32 laptops available for use by pupils, accessible in lessons on trolleys in the teaching room. E-portfolios of work are being constructed by the pupils using these ICT resources. Pupils have access to resources such as company details on-line – for example, about Brewers Wholesale, with information linked to contents, some in the form of video, some as imagery.

There are indications that a range of pupils involved have already benefited from use of on-line courses. Some pupils have started to create data bases on-line, some specifically designed for use in a real video store. The pupils involved will take their solutions to the video store, and this form of work provides a direct link between real audience and need, and work within a school environment. The curriculum is being changed to accommodate the increasing need for pupils to use up-to-date ICT resources. Year 7, 8 and 9 pupils follow a compulsory ICT course, which includes the creation of web pages in Dreamweaver, for example. A teacher gave examples of how such a curriculum can impact upon pupils. One pupil now working at level A was predicted as a level E according to a PAT analysis. The teacher feels that this is an example of a pupil who is taking control of her or his own learning. An on-line course provides materials that can be re-read and it is possible for pupils to look at items as and when they are needed. The teacher believes that year 9 SATs are likely to be improved because pupils are involved in an on-line course. She feels that maybe those who enjoy using the internet enjoy an on-line form of learning. With an on-line course, the same work is provided for everyone – not a series of difficult worksheets, but work offered in small chunks (each about 10 minutes duration), broken down into sections. The teacher finds the students are reading the material, that they work through the tasks, and remain on task. The Varn Dean on-line course materials ‘talk’ pupils through the work, and pupils email their work to the teacher. Comments are sent back (and commentary boxes are used to provide new targets for each pupil to meet).

A group of business studies pupils have been involved in an accelerated learning week. A number of year 10 pupils have been taken to GCSE level through an intensive week-long course. Ten pupils (3 high ability, 4 middle, and 7 lower ability in terms of literacy and numeracy) were involved. The school worked with Sainsbury's on-line and HSBC on-line

materials. A partnership with a local university enabled the materials to be used on laptops. Pupils created a portfolio of work, and there was a mock exam at the end. All pupils scored 60-70 out of 70 by the end of the week. The laptops were used to create an e-portfolio that integrated video, and digital images. Peer feedback and HSBC feedback was provided throughout the week. Within a week, all pupils completed their GCSE course (and the GCSE was taken in June 2004). Pupils worked from 9 a.m. to 6 p.m. each day. Pupils recognised the importance of the continuity of work that was possible through the week. It was recognised that ICT helped with writing and presentation, using MS PowerPoint and MS Word, and the teacher felt that the exercise could not have been done without the ICT involved: use of the on-line resource, use of the Business Education web site, for writing, and the production of the portfolio.

The school is considering repeating this exercise with a whole class next year. The exercise will also be tried with art and history groups, but to complete the necessary coursework for these subjects, a 2 week programme might be required for these subject areas.

Pupil uses of ICT

Pupils are using ICT to enhance and extend subject outcomes in English. In this subject area, year 10 pupils have been involved in creating a video reconstruction. Year 10 pupils work on Shakespeare plays. Pupils have completed traditional coursework, which involves comparing 2 films of the play Romeo and Juliet. Following this, pupils made a video and took images of enactments of the elements of the play that they would want to see changed. They used Music Maker to edit the video and images, to put in sound, and music. The finished product indicated that a great deal of focus and emphasis can be placed through this form of medium on mood, the role of music, uses of imagery, involvement of text, uses of features such as fading, image capture, and manipulation. This form of outcome could not be captured or presented adequately in any other way – there are aspects of work that pupils can demonstrate using this medium that cannot be expressed otherwise, and that currently are not able to be included in any syllabus for that reason. This medium can allow elements of outcome to be captured and assessed that could not be previously considered. This form of outcome could be used to extend the range of understanding that could be brought to this age group.

Links to uses beyond the school

The school is involved with a consortium in developing a learning portal to suit certain specific needs and purposes. A portfolio system is being developed using Digital Brain as a virtual learning environment (VLE) system. The VLE covers the needs of the members of the consortium - 3 secondary schools and an FE college. An index is provided via a map in Flash. Some learning modules have already been placed onto some web pages. Each page with a learning module has been constructed by pupils or local people and teachers. The pages give access to text and images. A portfolio system enables transfer of work from school to college. An example is the languages project, where each pupil has a home page and work is stored there. Scanned work is retained in the portfolio, work can be uploaded, and can be accessed from home. Course materials are accessible by the pupil. The facility means that any teacher can in essence 'write' their own course 'book'. Video conferencing is not on-line yet, but a chat facility is in place. Links to work and web-sites can be saved. Subject areas contain stored teacher work. Some pupils have produced their own web pages on the VLE. Pupils in one school have developed web sites on capital punishment issues, for example.

When pupils are handling their work on the site, there are three different options open to them: to place the work in a personal area; to place it in a courses area; to submit it to the digital portfolio area. There is an official digital portfolio area where work, once submitted, cannot be altered by a pupil. Work that pupils intend to change would be kept in either a personal saved area, or in a work area within a specific course. A course area belongs to an institution and allows pupils and the teacher to 'handle' work, including comments. A personal area belongs to the pupil, but can be accessed by teachers.

Case Study 7: E-learning with an information focus

Summary of key points from an e-learning perspective

1. A year 6 class in the school was involved in a design and technology project, involving a partner school. One school made a buggy, and the partner school made a bridge. Communication technologies were used to support the joint development.
2. Pupils had access to a computer with internet access, an interactive whiteboard and data projector, digital video camera and digital camera, and email. Design and technology displays around the room supported particular aspects of their work.
3. The regional project (Crossover) provided a DVD with a video to introduce the project, and provided newsletters with regular information about ideas, progress, and outcomes from across all schools in the project. Pupils worked on the project over a number of weeks, in discreet sessions.
4. Pupils were able to use the internet to search for and find supportive and explanatory information. However, limited access to ICT by the partner school meant that communication was limited. As a consequence pupils did more work on building bridges, but did less co-operative work through a communications medium.
5. Pupils worked in groups, and provided ideas individually that were built into their structures. Trial and error methods were used often to solve problems.
6. Pupil groups produced MS presentations of their work. Some presentations showed use of advanced features, and effective ways of presenting to an audience. Some features were used in creative ways, and some pupils created solutions to specific needs. Some pupils had thought about how to integrate elements from their partner school into a joint presentation. Others had included clip art to illustrate particular points, or had scanned in a design or used still pictures of work in progress. Other pupils had not used features effectively, and had not produced presentations that an audience could read easily.
7. Email was used to communicate with an 'expert'. Some pupils attached photographs of their work to enable the 'expert' to understand their queries more easily.
8. Pupils used ICT to support their research, communication, and presentation needs. The teacher would want in the future to extend the opportunities that the ICT provided, through access to more detail about certain design and technology aspects, by working with a partner school able to access ICT easily, and through video-conferencing with 'experts'.

School background

The school was involved in a design and technology project. The design and technology project required a group of pupils to build a buggy, to meet a particular specification. A partner school in another LEA was to build a bridge, and communication technologies were to be used to communicate about particular design and technology aspects and project outcomes that would enable each group to work on and contribute to a joint project outcome.

In this school the year 6 class was involved in building a buggy. There were 22 pupils in one session observed, with 8 girls and 14 boys. The partner school was to build the bridge.

ICT background

The classroom had a computer with internet access, provided through a broadband network link. There was a small interactive whiteboard on one wall, with data projector. The class had access to a 'Blue' digital video camera, a digital camera, and email. Pupils could download pictures from the digital cameras to a laptop.

ICT and the curriculum

The project was a design and technology activity, concerned with building a buggy. The class had already been involved in other design and technology activities, and the classroom had supportive displays of items. There were design and technology objects (for example, funfair items), photographs of pupils involved in design and technology activities, and the design process was on display too. A DVD was produced by the regional project (called Crossover), to introduce the activity, and the video content was found to be a useful way to inform pupils about the needs of the project, and to begin to stimulate ideas. Project newsletters informed the group regularly about the progress of the project and the progress of other groups. The pupils worked on the project over a number of weeks, in discreet sessions. In these sessions, the teacher set up an industrious environment, with pupils working in groups. She constantly challenged the groups and monitored their activity.

Experiences with broadband access

Although the school had effective broadband access, the limitation for this group resulted from the limited ICT access of pupils in the partner school. The pupils in this school had to wait a week for a reply to an email, so they found they had no bridge design or diagram from the other team to work with, and no copy of the partner school's MS PowerPoint presentation that would show their work to them. As a consequence, the pupils in this school built their own bridge. So, the lack of effective communication increased the amount of work that this group had to do, and reduced the ways in which the groups could work co-operatively at a distance.

Broadband access and content

Broadband access did mean that pupils in this school could search for and find resources that supported their needs. In some cases these resources illustrated aspects that they wanted to look at, while for others they provided some levels of explanation.

Pupil uses of ICT

Pupils worked in groups on the project, and each group undertook a complete design and make of both the buggy and the bridge. Pupils came up with ranges of ideas to be implemented, needed to identify the most effective and useful ideas, and supplemented these with ideas they gained from internet resources. Some pupils used the 'Blue' video camera to capture video of how the structures were being made. Pupils themselves were able to download the video onto the laptop. The laptop was chosen for this purpose because any software could be used on it (software on the desktop computer was limited to that provided as a part of the managed service provision).

The activities enabled individual pupils to offer contributions that would support the group need. In one group, pupils considered how to get people into the carriage they were building. They tried to use a ramp, but this did not work very easily. One girl came up with the idea of using a lift. Her father was disabled, and she was able to contribute details such as the need for straps to keep a wheel chair in place. Some groups solved

problems by trial and error methods, especially when considering the different materials that they could use.

The groups each produced a MS PowerPoint presentation of their work. Some presentations were executed in a professional way. Presentations were mainly completed at school. In one presentation, a pupil had inserted pictures of pupils working on the buggy, and there were speech quotes overlaid on the pupils, showing them saying things like, “What is she doing? That will never work!” and “this is so going to work!”. Another slide showed a circuit diagram, and for this the pupil had specially created the symbols used in the diagram.

Some MS PowerPoint presentations indicated that pupils had thought about how they would integrate elements from their partner school into a single joint presentation. In one presentation, two girls had included a picture of their partner school, which they had found on the internet. Pupils also displayed a range of abilities used to create presentations. In one presentation, pupils had created a slide to show the design and technology processes that they had worked through. In another presentation, two boys had inserted clip art images that they had found on the internet to demonstrate particular features. In another presentation, a buggy design was scanned and inserted.

Some pupils were not using the medium effectively, so the presentation would not help the audience to engage easily. In some cases writing was too small, and some features were used too heavily, so the commentary was delayed to the extent that a reader would not be able to read it easily. Some presentations used too many features, which detracted from the quality of the message. However, other pupils used more advanced features effectively, such as using hotspots to link to other pages. In some cases the photographs selected were particularly detailed, and close ups showed details that would not have been easy to see otherwise.

As a result of this activity, pupils learned how to operate both video and digital cameras, shared this knowledge with their peers, and selected photos for display, discussion and for presentation purposes.

Links to uses beyond the school

To gain additional support for the project, pupils used email to contact an ‘expert’, an engineer who could provide them with ideas and answer specific questions. To help the ‘expert’ understand their queries more, some pupils took digital photographs of their structures, and sent these as attachments. One group of three boys, working on a buggy, had emailed an ‘expert’ with a problem on a Friday, and had received a reply on the Monday. The ‘expert’ sent back quite an extensive set of ideas for them to try, covering about an A4 side.

ICT in the future

The teacher felt that the pupils had used ICT effectively in the context of a design and technology activity. They had used the ICT to support their research needs, their communication needs, and their presentation needs. However, the teacher thought that more detail about how gears and meshed gears worked would have helped. Illustrated explanations, or video examples of working gears and how a motor drives an axle, for example, would have been useful resources to have been able to access from an internet site.

In the future, the school would want to work with a school that had ease of access to email. The lack of contact was a problem, and although pupils did more as a result, the communication aspects of their work were not well supported. The teacher would also like to use video-conferencing as a means to communicate with 'experts'.

Case Study 8: Considering appropriateness of on-line resources

Summary of key points from an e-learning perspective

1. The head teacher and the ICT co-ordinator have led ICT development over a period of some 5 years. All teaching and support staff use ICT, and a placement student provides ICT support for staff.
2. ICT clusters have been deployed across the school, and there are 65 to 70 machines in place (including a wireless network of laptops). Interactive whiteboards have been deployed across the school also.
3. ICT is used widely in subject areas across all age groups. Pupils use ICT outside lesson times, typically girls using ICT at lunchtimes, and boys using ICT at register times and in computer club time.
4. ICT is now used as and when required, rather than it being used largely in ICT lessons. Early years' pupils use ICT for consolidation and reinforcement purposes, for research, and as an activity that they can choose. Early years' pupils like the size of items displayed on the interactive whiteboard, and they find the pen easier to use than a mouse.
5. The interactive whiteboard is used to support pupil activities with groups of pupils of all ages, sometimes working in a circus arrangement with other groups. Espresso resources are used most extensively to support this form of activity.
6. One teacher reports that pupils will tend to choose interactive exercises to do first, then the watching of videos, then activities involving writing or drawing. Although many pupils have ICT access at home, use at home appears to be often concerned with viewing and clicking, rather than with writing. There is felt to be a lack of a culture of writing in homes.
7. Pupils are encouraged to select topics that they need to target for revision, and are guided to ICT resources that will support these revision needs. Pupils are encouraged to work together on interactive whiteboards to work on exercises concerned with revision.
8. In some classes, activities are organised so that pupil groups can work effectively in teams. These resources might be constructed in Easiteach, for example. Education City resources are found to support individuals or pairs of pupils working on computers.
9. Broadband access is possible across the school, and performance is not determined by time of day. Access has generally been reliable, and speed of access is high.
10. Broadband resources used most regularly are those from Espresso. Learn Premium, Easiteach, and Education City resources are also used. Learn Premium resources are accessible at home, and teachers can access school work from home.
11. Levels and ranges of pupil use mean that pupils are increasingly able to determine for themselves when and how to use ICT.
12. ICT could well be used to further develop two aspects of pupil need: how pupils share and work in groups; and how a culture of writing is developed for both pupils and parents.

School background

The school has 420 pupils and a 60 place nursery.

ICT background

ICT developments have been led by the head teacher and the ICT co-ordinator (who is also a year 6 teacher). The ICT co-ordinator is released 2 days a week to support group teaching. All staff now use ICT – this totals some 19 to 20 teachers, and 10 support staff. Use of ICT to support teaching has increased over the last 2 years as a result of ICT co-ordinator support. Staff are provided with lists of web-sites by the ICT co-ordinator, listed in a paper-based document called 'Web-sites for Teachers', written by Jim Mervett (published in 2002). A third year placement student from a local university, paid as a teaching assistant, provides ICT support, which has directly helped teaching staff. The head teacher feels that this £7,500 investment has been well worthwhile.

ICT clusters were placed around the school, rather than an ICT suite, some 4 and a half years ago. There are now some 65 to 70 machines in place, including a wireless network of laptops. There are interactive whiteboards throughout the school.

Pupils use the computers at times outside lessons. At lunchtimes girls typically use the facilities, for email and for MS PowerPoint. Boys use ICT at register time, and Computer Club for year 5 pupils tends to attract more boys.

ICT and the curriculum

The curriculum approach has moved from ICT lessons originally, to now using ICT when and as needed. The head teacher and ICT co-ordinator have discussed the features of an e-confident school, and how far the school has met these features. Teachers use ICT widely, matched to specific year group needs. Observations of lessons during one day indicated a range of uses for different age groups.

In year R machines are on all the time, with something available for pupils to watch most of the time. Pupils work on the 2 computers in pairs. Using the Espresso resources, they can watch a video then do an activity from the Early Years section. For example, one activity was concerned with a missing body part – the pupils needed to click on the correct part. A video they watched from Espresso resources was on animals. It is found that the pupils like the colour and the sound in the resources. ICT is used in a number of ways with this age group: for consolidation and reinforcement, particularly in areas such as phonics and mathematics; for research, on animals for example; and as an activity that pupils can themselves choose, with packages put on specifically for this purpose. Two year R classes share an interactive whiteboard. It is found that pupils in year R respond well to its use. Pupils like the size and they like using the pen. They find a pen is easier to use than a mouse for Colour Magic or for writing. Resources used are mostly Espresso, but Zoombeanies are also used.

In year 1, 2 classes were working in a circus arrangement - one teacher was teaching RE while the other taught music. In the RE lesson, Ramadan festivals was the focus. The interactive whiteboard was used to explore Ramadan festivals (using Espresso resources). Then pupils explored real artefacts that were distributed across a number of tables. A video clip from the Espresso resources was used to show Ramadan festivals, after the teacher had introduced the topic through talking about holy days. The teacher followed up the video with questions, then read a text from a book and showed the pictures (pupils were not able to see these clearly due to their small size, and could not concentrate on the text as this was only read out, and not shown). The pupils were told about the artefacts on the tables, and the Espresso resource was used to describe these (although there were

some spelling and grammatical mistakes in the Espresso resource). The page was left on the interactive whiteboard so that the pupils could refer back to it as they wanted. Groups circulated around the resources, which included looking at the material on the interactive whiteboard. One group demonstrated that the pen can become an object of importance in itself, and that pupils may want to dominate use of it and to control access, if group actions and individual roles are not well established at the outset.

In a year 4 class, 3 pupils used the computers. The pupils have used Espresso resources in all subjects, for example, looking at reports of natural disasters during the previous week, including looking at a video of a volcano disaster. They have also used Learn Premium resources from the interactive history section, such as those on Saxons, for example. In the activity on Saxons, different pupils found out about different parts of the village, and then fed back to each other. Pupils use BBC resources a great deal too – the teacher says these are ‘much more child friendly than me standing and talking about it’. One pupil was observed using an interactive program to dress soldiers – a Roman, a Pict, and an Anglo Saxon. She clearly enjoyed using this program. Pupils said that they use ICT almost every lesson. The teacher encourages pupils to indicate how they could use ICT – the previous week pupils suggested colouring and labelling an item being made for design and technology, for example. The teacher says the pupils tend to use interactive exercises first (involving choosing, and clicking on), then videos, and then activities involving writing or drawing. The teacher finds typing skills are low, even though very few (only 5 out of 30 pupils) are without ICT at home. Quite a lot of pupils also have internet access at home. Home use appears largely to be concerned with viewing and clicking, rather than writing. The teacher feels that home access could enable pupils to finish items at home.

In a year 6 lesson, Learn Premium was used for mathematics revision. The interactive whiteboard was used to revise topics – probability during this lesson, in readiness for SATs the following week. The teacher maintained the pace and kept posing questions. A pupil was asked to choose a question to investigate. The pupil had to enter answers in the computer linked to the interactive whiteboard, or had to use the pen on the interactive whiteboard. Pupils worked on the interactive whiteboard or on the computer to select aspects to revise for SATs. They worked in pairs on the computers or in a group of 4 pupils on the interactive whiteboard. Four computers and the interactive whiteboard were used in the lesson (this involved 12 pupils, and other pupils worked on tables). They moved around after 20 minutes. They were asked to think in advance about the topics they wished to revise. The pupils working on the interactive whiteboard were looking at calculations of areas and perimeters. They did not find a way to enter a side length (one pupil entered the length on the linked computer, but this was located across the room, so was somewhat difficult to access). It appeared that the means to share use of the resources was not clear to the pupils. The pairs of pupils working on the computers all accessed Learn Premium resources. The amount of revision being undertaken was difficult to clarify, especially as the selection of some resources might have been due to sound being available as well as it being a target priority for revision. Reports showing scores attained in a given time was clearly an important feature for the boys using these resources.

In another year 6 lesson, the interactive whiteboard was being used as a game. Two teams of 2 were involved – 2 boys and 2 girls. The topic involved was improper fractions, and the game was constructed in Easiteach. Pupils had to find matching improper and mixed numbers on the grid, and the colour indicated which team had

matched them. Elements of this game were concerned with memorisation of where particular numbers or fractions lay on the grid, rather than it being purely mathematical. However, the activity worked well with pupils, because they were organised in teams. Three other pupils were using machines with Education City resources – one pupil per machine. The teacher had given the pupils specific activities to look at: matching figures to the names of figures, identifying angles, and using numbers to make other numbers. The resources were clear and pupils were well engaged using them. The teacher checked how pupils were progressing and advised which questions to try again. The teacher felt that Education City was ideal for individual or paired pupil use, but not for interactive whiteboard use. The teacher finds the feedback in Education City to be limited: poor answers mean that the program logs out the pupil, and there is no feedback on scores obtained. The teacher has used Education City science resources on the interactive whiteboard, but French resources have not been explored. In Learn Premium resources, 2 wrong answers mean that the right answer is given. The teacher finds that the RM maths management system offers too much - less and more focused feedback would be more helpful.

Experiences with broadband access

The broadband access has been found to be reliable, and has only occasionally been down. Speed of access is high, and this has led to increased use by teachers. Communication resources such as video conferencing have not been used, but an intranet shared area is used, and all full-time staff have a laptop and use email a great deal.

Teachers have found that interactive whiteboards have enabled groups of pupils to work together, in all curriculum areas. The range of ICT resources available, and the regularity of use by pupils, means that pupils can determine increasingly themselves when to use ICT, and do use it as and when needed.

Broadband access and content

Broadband access is possible across the school, at all times, and its quality or performance is not recognised as being related to time of day in any way. Home broadband access is dependent upon the access that parents can provide.

The main broadband content used in the school is the range of Espresso resources. Learn Premium, Easiteach, and Education City are also available and used.

Links to uses beyond the school

It is thought that perhaps 75% of pupils have ICT access at home. It is felt that they use CD-ROMs or educational web-sites mainly. Learn Premium can be accessed at home, but Espresso is available for school access only. Teachers can access school work from home, and a teacher portal is currently being developed.

ICT in the future

In terms of educational needs of pupils, there are two areas where ICT could well have further impact in the future. The first is concerned with sharing and group work. Pupils in different year groups indicated their inabilities to share readily, and their inabilities in terms of being able to manage themselves in groups. Teachers have already started to use interactive whiteboard and associated resources to consider how to address these areas. Monitoring of outcomes in these respects, and a consequent, focused strategy, could well address these areas further in the future. Certainly observations suggested that pupils need

to understand more how to share, how to manage themselves in groups, and how to review what they have achieved in parallel with understanding their interests and attitudes.

The second is concerned with a lack of culture of writing amongst parents. ICT is already being used to encourage writing and typing, and could be further used in a variety of ways. A typing course aimed at developing typing skills in a short time period could assist in this respect (there is a course which uses colour patterns, and can be taken in only four hours, involving a one hour session each week over a period of 4 weeks, for example). This course, called Touch Typing in 4 hours, is available from Accelerated Teaching Systems (ATS).

Case Study 9: Benefits of using interactive whiteboard technologies

Summary of key points from an e-learning perspective

1. The school is in a socially deprived area, and the school has put a range of additional opportunities in place to support pupils in this context. A music band is run after school regularly, and a breakfast club has run for the last 18 months, for example.
2. ICT developments have been strongly supported by the head teacher, and the ICT co-ordinator. All staff use ICT in their curriculum areas.
3. There is an interactive whiteboard with full set-up including speakers in every area of the school. Appropriate uses are focused for each year group, including 'touch' and 'move' activities for the younger pupils.
4. Reliable internet access has meant that "the world is now in the classroom". The school has a range of on-line resources, and specific staff look at other resources to fulfil their specific needs.
5. Pupils are able to identify readily the benefits and advantages of using ICT, and particularly the advantages of using interactive whiteboards.
6. Pupils from across the school have identified a range of aspects where interactive whiteboard features are supporting learning, specifically: engagement and attention span; direct use and interaction; forms of engagement that relate to learning styles or approaches; aspects impinging on the psychology of learning; pace and style in lessons; matching the needs of subject areas; involvement, collaboration and ownership; context, pertinence and relevance; and a focus on the 'real' audience.
7. Pupils are not becoming bored with the uses of interactive whiteboards. They are seen to provide a variety that cannot be matched through any other medium.
8. Direct interaction is supporting younger pupils particularly. Aspects such as turn-taking and collaboration are being supported through enhanced visibility.
9. Each learning approach (auditory, visual, kinaesthetic) is supported through the use of interactive whiteboards. Alternative voices and alternative ways of seeing things are recognised as being particularly advantageous by pupils.
10. Interactive whiteboards are supporting recall, association of ideas, reconstruction of ideas, and modelling of ideas and outcomes.
11. Pace is supported by interactive whiteboards, as distraction elements are reduced, and a seamless flow can be planned and implemented. Clarity of writing, of detail, and high visibility means that pupils gain a 'sophisticated' view of topics being taught.
12. Subject areas are widely supported by interactive whiteboards. Teachers can involve individuals and the class. Discussions about learning and learning strategies can be more readily engaged.
13. Internet access allows real and up-to-date information to be accessed readily. Pertinence and interest are maintained all the more as a result.
14. An area to enable shared access by teachers and pupils would be welcomed by the school as a means to support teacher needs and pupil involvement.

School background

The school is in the bottom 5% of areas of social deprivation. Only 5-6% of pupils go on to higher education. Pupils overall have low self-esteem. To address this issue, the school provides a range of additional opportunity. For example, the school provides instruments for pupils to play, and a band is run after school. For the last 18 months a Breakfast Club

has been run from 8.00 a.m. regularly. The school has a 26 place nursery, for 26 pupils in the morning, and 26 in the afternoon.

ICT developments have been supported strongly by the head teacher. The ICT co-ordinator is an ex-LEA team member.

ICT background

The school has a well-developed ICT infrastructure. The LEA has provided some funding to develop a primary learning network across four boroughs. The school is twinned with a school in another borough. The network has produced eight interactive packages, and this school has been involved in a package that has looked at networking, and the transition between Key Stage 1 and Key Stage 2.

The school now has an interactive whiteboard in every area of the school (all are Smartboards). These are used by newly qualified teachers (NQTs) as well as other teaching staff. Each area has a full set-up, including speakers, so that composition can be undertaken, and music can be played readily.

ICT and the curriculum

ICT resources are used across the curriculum, but different use is made in different classes. Nursery pupils use the computer as part of their curriculum. In the reception area the interactive whiteboard is used with 'moving' items particularly. In year 1 the interactive whiteboard facilities are used to uncover lines of a poem, one at a time – and for discussing missing words, for example. In years 5 and 6 the interactive whiteboard is used to highlight tenses, connectives, and paragraph headings in colour, for example.

Experiences with broadband access

Teachers regularly access internet resources for teaching purposes. As the head teacher says, "the world is now in the classroom".

Broadband access and content

The school has purchased a range of resources, including Espresso, Granada Learning, and ICT Alive (they are currently experimenting with the latter). Some staff already modify resources for use on the interactive whiteboards, to provide resources that are interactive. The ICT co-ordinator saves all unit plans in a shared teachers' area. The SENCO has looked at a catch-up program, called Booster.

Pupil uses of ICT

Groups of pupils from four different year groups were asked about their experiences with ICT and interactive whiteboards. Their responses indicated that there are benefits and advantages arising from a number of distinctive features.

The year 2 group comprised 2 girls and 2 boys, all from the same class. They say they use the interactive whiteboard all the time (except when it is not working). They take it in turns or in groups to play games, and say they can look at information. Star Words is their favourite game, but they also like the game where there is a 'man going up a hill to addition and subtraction' (Mr Creep), Puss in Boots, and Genie and the Clever Cats. The interactive whiteboard appears to help this group with turn taking and collaboration.

The year 4 group comprised 2 girls and 3 boys, all from the same class. They have a computer in their room, and work with partners when they use it. Use is made in register time, when a rota system is in place. They access mathematics games, primary games, and Google. They choose games to play, but also work on anagrams, science videos from Espresso, and word games. They say that mathematics is made more interesting by use of the computer. The interactive whiteboard has been in the classroom from midway through year 3. They say it freezes sometimes, and then does not work with the internet.

The year 5 group comprised 3 girls and 3 boys, from 3 different classes. They say they use the interactive whiteboard in almost every lesson, including music, but not art and PE. They like games like Bubblegram and Multiple Bubbles on Espresso, and like going on videos on the internet.

The year 6 group comprised 4 girls and 4 boys, from 3 different classes. They all work together for literacy and revision classes. They have had an interactive whiteboard for about 2½ years, and say they are not getting bored with it. They say it was hard to get used to initially, and it took between 2 weeks and 3 months to get used to how it worked.

The distinctive areas the pupils identified when they talked about uses of the interactive whiteboard are listed below. Following this list, pupil responses from different year groups are provided in tables, with comments related to specific features of the interactive whiteboard. A commentary follows each table.

The distinctive areas identified by pupils were:

- Engagement and attention span.
- Direct pupil use and interaction.
- Forms of engagement and learning approaches.
- Aspects concerned with the psychology of learning.
- Pace and style in lessons.
- Matching the needs of subject areas.
- Involvement, collaboration and ownership.
- Context, pertinence and relevance.
- A focus on the ‘real’ audience.

Engagement and attention span

Interactive whiteboard features	Year 2 pupil responses	Year 4 pupil responses	Year 5 pupil responses	Year 6 pupil responses
It engages over a long time period	Use it a great deal	Used a lot	-	Had it for about 2½ years and not getting bored with it
It can engage pupils through the forms of game activities that are not available in other ways	It can be used for games as well as looking at information (dot-to-dot game)	-	Like games on Espresso	Attention is drawn to it
Variety is enhanced	-	-	-	Variety is important, games, tests, words, pictures, changes

Pupils are not getting bored with the use of the interactive whiteboard. As they say, the interactive whiteboard offers a great deal of variety, including access to educational games that would not be accessible through any other medium.

Direct pupil use and interaction

Interactive whiteboard features	Year 2 pupil responses	Year 4 pupil responses	Year 5 pupil responses	Year 6 pupil responses
It can be used by pupils as well as for teaching	It is used in turns or in groups	Take use in turn	-	-

Pupils at younger ages particularly relate how they have used the interactive whiteboard directly. They indicated that they used it in turns or in groups. This form of arrangement needs to be managed effectively within the classroom. However, teachers with pupil groups that have some behavioural difficulties say that turn taking is enhanced through use of the interactive whiteboard, because of the greater visibility of the work in hand.

Forms of engagement and learning approaches

Interactive whiteboard features	Year 2 pupil responses	Year 4 pupil responses	Year 5 pupil responses	Year 6 pupil responses
Auditory features provide 'other' voices	Can listen to poems	-	Sound effects are good	-
Visual elements highlight and enhance things being covered	Can choose colour	Can see pictures, can put a background in	Like seeing videos from the internet, can see in your mind more	-
Kinaesthetic features can support pupil interaction	-	-	Can click and drag	More things to do

Pupils indicate that auditory, visual and kinaesthetic features are all important for them. Alternative voices, and alternative ways of seeing things, are identified as being important.

Aspects concerned with the psychology of learning

Interactive whiteboard features	Year 2 pupil responses	Year 4 pupil responses	Year 5 pupil responses	Year 6 pupil responses
Things are remembered through association with activity, colour, movement, etc.	Remember quite a lot that are associated through activities and features such as colour	Can change colour of pen	Can change things, cartoons help, can picture things in the mind, and then it is possible to remember	Can move and see pictures, can rotate them, easier to learn with activities, can memorise things, can recall things more

Reconstruction of ideas can be accommodated	-	Can move things around, rearrange things, put in things that are forgotten, put them in the right order or place	Can change fonts, and can discard easily	Can add or delete things, can show where to improve, how to do it
Modelling of ideas and outcomes is enhanced	-	Can make things correct that are wrong	Can try things, can try possibilities yourself	Tells you when you go wrong, with spelling

Interactive whiteboard features such as colour and highlighting are enabling things to be recalled more easily, which enables things to be associated more readily, and thus enhances memorisation. The fact that features enable movement, and rearrangement, for example, means that concepts can be reconstructed, which leads to positive learning. Amendment and correction means that learning outcomes can be modelled to greater extents. All these facilities support learning positively.

Pace and style in lessons

Interactive whiteboard features	Year 2 pupil responses	Year 4 pupil responses	Year 5 pupil responses	Year 6 pupil responses
It is possible to easily go back to review something already done	Can save things	Can save work to another board, cleaners don't rub the work off	Can save work, can go back to things easily	Can leave things, do not need to 'rub things out'
Distraction elements are reduced	-	Traditional boards squeak and pens run out	-	-
Clarity can be enhanced	-	Can make writing bigger	Pictures are better than those drawn by teachers	'Computing writing' is clearer
Detail can be enhanced	-	Labelling helps	Explains better, diagrams help, can click on words for explanation	Can make things bigger
The 'unexpected' can be used	-	-	Can cover things or use the 'blind'	-
What is seen is 'neat', and felt to be sophisticated	-	-	It is neater to uncover using the interactive whiteboard	-
Visibility is important	-	-	-	It's like having a 'giant computer on the wall', can see things easily

Pupils report that pace is enhanced when using the interactive whiteboard, as one topic or element of a lesson can lead seamlessly to the next. However, this feature also requires adequate teacher planning and preparation, and pauses can still occur if interactive whiteboard lessons and resources are not prepared sufficiently in advance. Pupils identify clarity and detail as being important – sometimes indicating that teacher writing is not clear. However, the need for annotation on screens should also be recognised, and the impact of teacher writing when annotating is not the same as the larger amount of writing that might be produced on a board generally. What does come over strongly is that pupils

see the interactive whiteboard as being neat and sophisticated, and this clearly has an impact upon them and their willingness to engage with this medium. Visibility is also important – items of the size of the board offer a form of visibility that is not otherwise possible, so everyone can see what is being referred to, and what the teacher is doing. This form of visibility means that pupils are not competing with each other to try to see what is happening.

Matching the needs of subject areas

Interactive whiteboard features	Year 2 pupil responses	Year 4 pupil responses	Year 5 pupil responses	Year 6 pupil responses
Numeracy aspects can be covered, and remembered	Can cover areas of numeracy (number grid)	Maths questions are put on the board	Helps a lot with maths	Maths is covered a lot
Subject areas and topics are covered widely	-	-	Easter story and RE, helps with the Tudors, can use objects, a ruler, protractor, music paper	Used in all subjects

It is clear that subjects generally are supported through the uses of interactive whiteboards. Numeracy is recognised by pupils as a subject where interactive whiteboards aid learning.

Involvement, collaboration and ownership

Interactive whiteboard features	Year 2 pupil responses	Year 4 pupil responses	Year 5 pupil responses	Year 6 pupil responses
Checking answers becomes more of a shared activity	-	Can use a 'blind' to check the answer	-	-
Collaboration is enhanced as the focus of attention is shifted from teacher to teacher AND interactive whiteboard	-	Can work together more, can see things more and work together	Concentrate more, boring if using the static board, teachers talk too much, helps to work together to solve problems	Can show pupils' work easily, help each other, work together more

The interactive whiteboard is a collaborative medium. Its use can involve a whole class, as well as individuals within a class. Discussions around learning strategies are more easily managed, and problems can be tackled and solved collaboratively.

Context, pertinence and relevance

Interactive whiteboard features	Year 2 pupil responses	Year 4 pupil responses	Year 5 pupil responses	Year 6 pupil responses
Can access 'real' situations	-	-	Can see things in every day life situations	-

The ability to access the internet means that resources are not only 'real', but also often as up-to-date as is possible.

A focus on the 'real' audience

Interactive whiteboard features	Year 2 pupil responses	Year 4 pupil responses	Year 5 pupil responses	Year 6 pupil responses
Discussion about learning can be focused on	-	-	Discuss things more, try to work out strategies, try them out, and tend to remember strategies more	Helps to discuss more

Fundamentally, the interactive whiteboard enables a focus on learning. Having well prepared material, and establishing a discussion context for pupils, means that learning and learning strategies can be focused upon, as the screen provides a visual backcloth and a medium where explanation can be 'seen'. 'Teacher talk' (explanation) can be visualised more by pupils, as ideas can be shown or exemplified on the screen.

ICT in the future

Resources to enable a greater sharing for pupils and teachers would be welcomed. The ICT co-ordinator would like to see resources created and saved in a single area, so that pupils could see more answers, and engage and contribute more.

Case Study 10: Enhancing pedagogy and impacts of home access

Summary of key points from an e-learning perspective

1. There are a number of teachers who lead on ICT developments across the school, but all staff use ICT with their classes. The ICT co-ordinator has provided training and support in a variety of ways, in a variety of contexts.
2. ICT development was identified as an aspect of need in an early Ofsted report, and the school has subsequently developed ICT strongly across the school. The ICT suite has enabled ICT skills to be taught to all pupils from year 1 using an amended QCA Scheme of Work, while interactive whiteboards enable resources to be used across the curriculum. Younger pupils are involved more in 'touch'-based activities, while older pupils are involved in activities with video and animation.
3. There is a rolling programme with regard to equipment. The school facilities are to be upgraded in the future, which will further accommodate access within and beyond the classroom. The LEA provides a technician for one day a week.
4. All teaching staff have a laptop, used with the interactive whiteboard in their classrooms. Laptop use has led to improved quality of presentation of resources, and to improved sharing of lesson resources and plans. Subject leaders use specific assessment and planning software to support their subject needs, to share planning and resources. It is reported that teacher efficiency has improved as a result of uses of reliable internet access.
5. Internet access has been variable at times, but teachers widely use internet and intranet access within their classrooms. Current planned investments will continue to support the quality of this access. Some broadband uses have not yet been explored in school, such as the uses of video conferencing.
6. Teachers have access to a range of resources, including resources that are video and sound rich. There are calls from teachers for more of this form of resource for uses in science teaching, for example.
7. It is recognised that the use of the interactive whiteboard has enabled different approaches to teaching and learning. The use of the interactive whiteboard as a focus for discussion in classrooms, and as a means to support the flow of lessons so there are fewer 'spaces' for distraction have been recognised as being important. Teachers also demonstrate the value of additional visibility that is offered, so that the focus of attention is more forward, attention can be shared between different voices, and attention can be supported through a visual as well as an auditory focus.
8. The use of science resources means that a focus can be on the analysis of results, and on trying out hypotheses, rather than being just on repeating a set of procedures to complete an experiment.
9. Some pupils demonstrate high levels of attainment with regard to National Curriculum ICT, with some examples being at levels 6 or 7.
10. Pupils are well aware of the advantages and benefits of using ICT resources such as interactive whiteboards. They can identify the features that support their learning, and their improved behaviour.
11. Pupils at home are using Think.com to access teacher comments to support their homework. The facility also enables homework to be saved, so that it can be printed out at school.
12. Some pupils recognise that their ICT skills are being enhanced through the work they do in school, and that this is enhancing their abilities at home to undertake certain forms of work. Some pupils are accessing at home the resources they have at school,

and are finding other related resources on the internet. Teachers can pick out key ideas or points from these identified resources to discuss them more widely in class. In this way, pupils are leading learning in some respects, and teachers are encouraging this approach.

School background

The school has a 3 form entry, and there are currently some 720 pupils on roll. There are 23 classes in the school, 10 infant classes, 12 junior classes and a nursery class.

There are a range of staff who lead on ICT developments and use across the school: the head teacher, the deputy head teacher, the ICT co-ordinator, and the numeracy co-ordinator.

ICT background

In 1998 ICT was identified as an Ofsted development need. The school received soon afterwards an NGfL grant, which was used to fund a dedicated ICT suite. Classes have been timetabled to use the suite, for 1 hour per week per class, for all classes from years 1 to 6.

In 2003 an interactive whiteboard was put into every classroom, including the nursery and reception rooms. Although use varies between year groups, all pupils use the interactive whiteboards. Nursery and year R pupils are involved in a lot of activities concerned with 'touching' the interactive whiteboard. Older pupils use on-line learning resources more, including the uses of resources with video, and animation. When the interactive whiteboards were set up, classes were equipped with a laptop, data projector and interactive whiteboard as a complete package. It has been found that the laptop has had a tremendous impact. All staff found they had access to resources both at home and at school, so high quality presentation came to be expected. It was found that there were time savings as well, as staff could share resources including lesson plans, more. The ICT co-ordinator supported staff across the school, and even provided some support in teacher's homes. He has run workshops, for example, showing how hyperlinks and sound can be linked into and accessed through MS PowerPoint presentations.

When laptops were provided to each class, the ICT co-ordinator bought software designed to support assessment and pla

skills learning to be put in place, while the interactive whiteboards have allowed use to go across the curriculum widely.

Experiences with broadband access

There is full internet access across the school, although performance in terms of access has been varied at times. Internet access in the ICT suite has been slow on some occasions, so the school are investing in a bandwidth upgrade to address this issue. Upgrading of electricity supplies are also planned, to reduce trailing cables and long leads in some areas of the school. Some broadband uses have not yet been explored within the school; video conferencing has not been tried, for example, at this stage.

A major effect of reliable internet access has been an increase in the levels of access and use in classrooms. There have also been impacts upon teacher efficiency. Teachers share school plans, which reduces workload as a consequence. Teams of teachers plan work together for any one year group, so sharing is also aided. Shared resources produced by staff in the form of MS PowerPoint presentations are accessible for general use.

Broadband access and content

The school has a range of resources that run across the network. Espresso was a resource that was bought with e-learning credits. The school also has access to Easiteach and ReviseWise resources. Although the school has access to Espresso Virtual Experiments, teachers are now requesting other science resources, particularly Log IT and other virtual experiments.

It has been recognised that the use of resources on the interactive whiteboard is enabling a different approach to teaching and learning. It has been recognised that the interactive whiteboard provides a different focus for discussion. The fact that different teaching resources can be shown on the interactive whiteboard without interruption to the flow of the lesson means that pupils are not distracted by 'spaces' in the teaching.

Pupil uses of ICT

One year 6 class teacher is also the numeracy co-ordinator. After the afternoon register she uses the interactive whiteboard for a 'science afternoon'. She brings up a test paper, and enlarges it so that pupils can read it. It is left on the screen while the teacher asks questions and discusses the topic of 'teeth'. The test paper is visible all the time, and pupils do not have to look between the teacher and a copy on their desks. Their focus is constantly forward, and their focus is moving between the teacher and the interactive whiteboard. The teacher goes over four questions on the interactive whiteboard. The interactive whiteboard is used in this way to provide a starter element to the lesson, and pupils' engagement is maintained at a high level throughout this activity.

Following the starter activity, the teacher uses a 'Virtual Experiments' resource. The experiments have an auditory commentary with them, and this provides for the pupils a voice that varies from that of the teacher. At certain points the teacher stops the video and audio sequence, and talks about topics such as 'insulation'. It should be noted that the teacher does not attempt to speak over the video or its commentary, but stops the video to do this, which works effectively. The teacher discusses the results of the experiment in some detail, rather than focusing on the procedures needed to repeat the experiment. It is possible, using the resource, to run a number of experiments using different conditions. The teacher gets the pupils to estimate cooling effects, for example. She asks questions

of individual pupils, and having got their responses, and then asks whether other pupils agree with these responses. She is able to use this technique to set up a useful discussion, and to talk about how different pupils identify the answers they give. At the end of the lesson, at the end of the day, the teacher reads a story – with the cover of the book displayed on the interactive whiteboard. This offers pupils a visual backcloth that they can focus on constantly. This form of display also provides the teacher with a display that can be changed as regularly as required – something that can not be done in any other medium easily.

The on-line resources used in the school include:

- Testbase (for planning and assessment purposes).
- Espresso (for an after school mathematics club as well as lesson use generally).
- Easiteach (for wet break times).
- A shared area (for pupils and teachers, so that further classroom use can be made of the resources that pupils used in the ICT suite).

The school web site is being developed to share resources. For inclusion on the web site, pupils are producing MS PowerPoint presentation slides, to be collated into a revision aid. Pupils are working at high levels in ICT when they undertake this work, in the region of attainment levels 6 or 7 in National Curriculum ICT.

Two year 6 girls described their uses of ICT. They said that they had internet access available all the time in their classroom. They said they used the interactive whiteboard every day, and they could write on it. They said they used it for literacy, science, mathematics, history, geography, and art (for pictures from the internet), and during wet breaks, for games, in science, for example. They said it helped them to learn; it was easier to understand when topics were done on it, and that they could not do so much on a blackboard. They said that they could understand when topics were gone over in a different way with the resources available, and that it was used to go over homework and to discuss it. They said the annotation and highlighter helped, that the teacher's writing on the interactive whiteboard was clear, and that they could understand it when it was on the interactive whiteboard. They said that colour and images helped, they could remember more, could save and look back, and had access to a lot of resources. They also said that there was no chalk dust on the interactive whiteboard, and that it was possible to put music on to help concentration. They said they had access to Think.com at home, and could talk to friends through this medium. There was a homework page from teachers, and they could download files onto Think.com for printing in school. They said they had not had any problems with homework yet, so had not emailed the teacher for help. They said that their ICT experiences in school were supporting their uses at home - they now use MS PowerPoint at home because they know what to do from having used it at school. They said their knowledge of ways to use technologies was expanding all the time – they planned to use a video to record things and to collect them into a revision aid, for example.

Two year 6 boys said that they used the interactive whiteboard nearly every lesson. They said they used the pen or mouse in all subjects, and accessed the internet. They both said they have computers at home, and used Think.com to speak to others. They said the school web site had links, and they could put materials on the site with the teacher's agreement. They said they could do homework at home and put this onto the homework page. One boy had emailed teachers, to find out how to solve problems. The other boy

had emailed teachers about football team arrangements. They said the uses of ICT helped them to learn; that they could now type, and it was quicker to do homework. They said they had to be careful not to rush and make mistakes, but that the teacher showed them where there were errors so that these could be corrected. They said this helped them to find and change the mistakes. They said the interactive whiteboard was making available to them new resources rather than old books, and that they could find things without going into the ICT suite. They said it was easier, using some of the resources on the interactive whiteboard, to listen to two voices rather than one, that they could check facts and that one voice explained the other. They said that visual descriptions helped, that annotated colour features helped, and that it was quicker to work on the interactive whiteboard, as there was no need to wipe things out. They said it was possible to save any changes made, that it was easier to use different fonts and sizes, and that there was no chance of the chalk breaking or the need to clean the board. They said it was possible to change background and pen colour, and to indicate what was wrong using these features. They said they got bored when the interactive whiteboard was not working. One boy said that he liked 'working' (learning by doing) rather than listening, and that he had to listen more if the class was not using an interactive whiteboard. They said that diagrams were not as clear on a blackboard (for example, a diagram of a fox and rabbit). They said that with a blackboard you had to wait more, so pace was enhanced with an interactive whiteboard. One boy said that with an interactive whiteboard there was no need to wait – but when he did, when not using one, he started talking, got told off, did not like this, and then got into more trouble.

A year 3 teacher said the interactive whiteboard engaged pupils for longer. In the year 3 class, the teacher used the interactive whiteboard to show a topic on 'ReviseWise' Science – on foods. The objective for the lesson was on the static whiteboard. The teacher was using the resource with sound, and the commentary discussed different food elements - carbohydrates, vitamins, proteins, etc. The teacher put up an activity asking about putting a healthy meal together. Pupils needed to pick foods, then drag and drop the foods onto the appropriate positions on the screen. The teacher took the opportunity to comment positively on a pupil's responses. Following direct pupil use of the interactive whiteboard, the teacher put up a worksheet and handed copies of this to the pupils. The teacher asked questions and discussed answers. He put up another sheet, with pictures of foods. The teacher asked pupils to copy the sentences into their books, then to cut out the food items from the copied sheets, and to stick these in their books.

Links to uses beyond the school

It is felt that most pupils have ICT at home. Two different ways of linking educational practices between home and school are encouraged within the school. The year 3 class teacher finds that there are many resources that pupils can use for all topics covered in class. He has found that some resources, such as Primary Games in mathematics, are very useful, and some pupils go home and continue to use these types of resources. He said that some pupils find other resources or URLs and bring these into school. The teacher accesses the resources in class that have been found by pupils at home and picks out key points or ideas. In this way pupils are leading learning and the teacher is encouraging this form of educational involvement beyond the classroom.

Teachers monitor resources and access pupil files through Think.com. Year 6 pupils email teachers from home, about mathematics, English and science homework.

ICT in the future

Facilities within the school are to be upgraded in the future. Storing work in electronic form and supporting access beyond the classroom will be further accommodated when this upgrading takes place. One particular aspect for upgrading will be the server facility.

Case Study 11: E-learning with a focus on communications

Summary of key points from an e-learning perspective

1. A year 6 class in this school was involved in a design and technology project that involved a partner school in another LEA. The class in this school was involved in designing and making a buggy, while the partner school made a bridge.
2. The class had experienced some ICT issues that limited access, due to server problems. Although the class had access to radio linked laptops, these did not provide reliable access. The class had access to 4 laptops, and a digital camera. They could also use on occasions a computer suite with 35 machines, an interactive whiteboard and a data projector.
3. For the design and technology project, different groups in the class worked on different structures. A range of ideas had been gained prior to designing, accessed from internet and DVD sources. Useful information was displayed around the classroom at all times, so that pupils had access to sources around them, as well as their ongoing work continuing to contribute to the ongoing displays.
4. The digital camera was used by pupils to produce an ongoing record of their work. Images were of high quality and showed a useful range of detail.
5. The teacher had produced a list of useful internet sites in advance for the pupils to access. The teacher's husband had created a set of resources that were accessible from the teacher's home page.
6. Email access was limited because of the need to work through the school office, so emails received were limited to some 6 or 7 per day.
7. The groups produced presentations of their work using MS PowerPoint. Presentations were updated continuously, and accommodated the inclusion of work from their partner school. The final presentation of their work showed an understanding of how they had used the design and make processes to support their work.
8. A promotional video of the pupils' work was made to make this aspect of learning accessible to a wider audience.
9. The teacher used ICT to encourage pupils to widen their interests. She had set up a web-cam in her garage for pupils to look at a swallow's nest when the young were hatching and growing up. There is clearly a need for broadband to offer high quality imagery in these circumstances.
10. The teacher would like to explore the use of ICT more in the future to support the learning opportunities of pupils. However, it is clear that reliable broadband access will be needed if the forms of activities being set up already are to be developed further (web-cam access, home page resource access, and internet searches, for example).

School background

The school has some 400 pupils on roll. There are two year 6 classes, and one year 6 class containing 23 pupils is the focus for this case study. The school is located in a socially deprived area, and many pupils are from single parent families. The identified class was involved in a design and technology project, which also involved working with a partner school in another LEA. The class involved needed to design and make a buggy, while the partner school made a bridge.

ICT background

The class involved had experienced some issues with ICT access to the facilities required. The school server did not function for some weeks, so stable access was not possible until some 5 weeks before the project was due to be completed. Pupils had access to laptops, but they were linked via radio and were found to be unreliable. The classroom provided pupils with access to 4 laptops, and a digital camera.

Pupils had access on occasions also to a computer room, containing 35 machines, an interactive whiteboard and data projector. Pupils used the internet on these machines to search for items of interest, for example.

ICT and the curriculum

For the design and technology project, different groups in the class worked on different structures. The class needed to make a buggy as their part of the project. The class was divided into groups, and each group made a buggy. Some groups made bridges, so that the buggies could be tested on bridge structures. Four girls made one bridge in one day. The girls had produced a design in advance before constructing it. They looked at several bridges on the internet, and had looked at a DVD about Ironbridge and making bridges, which had been sent as a part of the project (which they liked and thought was useful). They particularly liked how the DVD showed how a bridge could be made. They chose to make their bridge with triangular structures, because they felt that these were the strongest structures they could choose. They made the bridge from rolled paper and sellotape only. They tested it, and it held at least 1,000 grammes.

The class worked on the project for some time – over a period of some 8 weeks. The teacher encouraged the class to initially focus on internet searching and to produce a variety of designs for buggies.

The teacher ensured that supportive information was accessible to pupils all the time. Information was clearly displayed around the classroom throughout the period of the project, in interesting ways. Notes on the front board offered ideas of types of bridges to look at, showed the buggy specifications, and the range of materials that could be used. There were copies of completed designs on the wall, as well as copies of weekly project newsletters, and emails received. A display of designs and ideas about buggies that had been printed off from the internet were hung from a cord that spanned across the width of the room. These items were visible all the time.

Each group in the class produced a presentation of their work in MS PowerPoint, and produced this in an ongoing way, as different project elements were in hand or completed. The presentations included text, still images, and flow-in features. The presentation by one group was designed to include details from both partner schools.

Experiences with broadband access

Although the school had broadband access, server problems had occurred at times, which had been disruptive in terms of providing a continuous internet access. Laptops connected via radio had not always provided totally effective access.

Broadband access and content

The secretary in the school managed email contact with the partner school. Because of time limitations, this meant that emails that were received were limited to no more than 6 or 7 per day.

Pupil uses of ICT

Pupils used the digital camera a great deal to record their work. Pupils took quite a lot of photographs – of high quality and showing a range of detail. Pupils had accessed quite a lot of internet sites, and the teacher had researched these beforehand and produced a list for pupils to look at.

Pupils used ICT to put together a presentation about their work. The presentation incorporated designs, images, text, and background ideas. The detail given about the design and technology processes involved in the project was particularly strong. The presentation identified how pupils had been involved in:

- Looking at background ideas.
- Designing.
- Making.
- Difficulties.
- Using ICT.
 - Email.
 - Presentation (use of video).
 - Research.
 - Recording.
- Testing (use of video).
- Safety.
- Final design selected.

The presentation was effective because it showed how things had been learned and what had been learned.

Links to uses beyond the school

The teacher constantly thought about the ways that ICT could support the pupils, and how ICT could provide pupils with access to a wide range of experiences. The teacher's husband had created a set of resources on bridges and buggies to support the pupils in the project, which could be accessed from the teacher's home page. The ICT used to support the design and technology project also supported other aspects of work. For example, the teacher had set up a web-cam in her garage to enable pupils to look at a swallow's nest.

The project the pupils were involved in was made accessible to a wider audience through a promotional video. To include the pupils in this video, a letter was sent home to their parents asking them to say in writing if they did not want their child filmed.

ICT in the future

The teacher indicated that she would like to explore use of ICT more in the future. She indicated that there were other useful websites that could be used more, such as those on bridges and invalid transport for a project of this nature. She also said that she would like to expand the use of email in the future, in order to email an expert, for example.

Case Study 12: E-learning and local library access

Summary of key points from an e-learning perspective

1. The school serves a mixed catchment area, and those who do not have ICT access at home have ready access in the local library, which is used regularly. There is felt to be a growing community awareness of the importance and benefits of using ICT.
2. Uses of ICT across the school have been developed over the past 4 years. Because of space limitations, the school has a wireless network and runs laptops that can be moved from room to room.
3. The LEA has supported the school in terms of advice, technical support and maintenance, central procurement of resources, and web based access to resources. This range of support has been well received, and felt to have enabled the school to reach its current position.
4. All teachers use ICT, and have the opportunity to develop skills through an accredited ECDL course. The head teacher and the ICT co-ordinator support them financially and professionally.
5. The school enables pupils to use specific resources as well as generic software. Pupils demonstrate the use of more advanced features of software. Uses of science resources are enabling pupils to become more independent when undertaking experiments.
6. A mobile interactive whiteboard and data projectors are supporting effectively the demonstration of skills in using software packages. These facilities are also supporting learners with specific learning needs, with story telling and writing.
7. Teachers and pupils access internet resources regularly, and would welcome access to favourites lists produced centrally and organised by year group.
8. Pupils in year 6 support year 1 pupils regularly. This works well for all concerned, and has enabled supply teachers to tackle ICT based work with some classes.
9. Pupils use ICT in a wide range of subject areas, and for communication via email with pupils in other countries. Specific learning outcomes and benefits have been identified.
10. A pupil culture of using local library facilities for homework, with the arrangements the local library has for ICT facilities, means that pupils can use ICT irrespective of home access. Library staff positively support educational uses, and they find that children are increasingly using ICT for educational reasons rather than for games.

School background

The school serves a mixed catchment area, and has about 130 pupils on roll. About half of the pupils are thought to be likely to have a computer at home. For those that do not, there is good access to computers at the library, and many pupils use this library access. Pupils do come into school with work that they have done using ICT at the library if they have no home access. It is felt that there is a growing culture of seeing the benefits and importance of using ICT amongst pupils and parents. The ICT co-ordinator feels that pupils believe ICT to be important to them.

ICT background

The head teacher is enthusiastic about ICT, and supports developments generally across the school. The present ICT co-ordinator has been in the school for 4 years. When she arrived, there were two skilled teachers in the school, and although other teachers were

less keen, they were encouraged to consider how to integrate ICT into their teaching and to support pupil learning.

When ICT development was considered some years ago, it was recognised that the school had no space to create an ICT suite. It looked for an alternative approach to deploying ICT, and created a wireless network across the school, with a hub in each of 5 classrooms, and a mobile hub in the other 2 classrooms. Tempus was the company that provided the wireless solution, but there were problems encountered in running MS Windows XP across the wireless system. There were also licence issues. The school experienced performance limitations for some 18 months. In September 2003 the school bought into the LEA SLA. The LEA advised technically on how to ensure reliable access, and although it was recognised that this necessitated a financial investment, the support gained has been very well received by the school.

The school currently uses 15 laptops on the wireless network. It is felt that having these resources has made a difference to the integration of ICT into the curriculum. At some times, for example, some pupils in one class can use a few laptops, while others can be used elsewhere. It is possible for teachers to book the whole set or just a small set. There is a timetable, with one discrete ICT lesson booked for each class each week. At other times there is shared use. Each class also has a standalone machine. The school has one mobile interactive whiteboard, and two data projectors.

The school has a separate curriculum and administration system – the school deliberately erred on the side of caution because of security concerns. Overall the school recognises the value brought by the LEA, recognising that the LEA enabled the school to do what they have been able to achieve.

At this time all staff use laptops and ICT. All staff have a username and password so that they can access the LEA network. Staff can install LEA-purchased software on their own machines. The school has two laptops from the laptops for teachers scheme, and would like to be able to offer more to staff. Three out of 7 staff have laptops currently. SchoolMaster is used for email facility, but the diary facility is not used. Currently the focus for ICT development is to look at skill development at a detailed level. There is on-line access for all staff to take the ECDL course. The head teacher has supported this by funding those who wish to take the examination, and by giving meeting times over to ECDL.

ICT and the curriculum

Curriculum access to ICT through use of the laptops is managed through a timetable arrangement (shown below). The use of the laptops can be negotiated between staff, and the free sessions on the timetable are intended to allow for flexible use of ICT within the curriculum.

Monday	Year 6 ICT	B	Year 6	L	Free (technicians)	B	Free (technicians)
Tuesday	Year 3/6	R	Year 2/5	U	Year 2 ICT	R	Year 4
Wednesday	Year 2/5	E	Year 3/4	N	Year 4 ICT	E	Free
Thursday	Year 1 ICT	A	Year 3/4	C	Year 3ICT	A	Charging for Computer Club
Friday	Free	K	Year 6	H	Year 5 ICT	K	Year 5

As well as specific software and resources, the school uses a range of generic software to support learning. Most classes, for example, have completed a MS PowerPoint

presentation (year 6 did this on the Victorians). Pupils make use of more advanced functions within generic software. For example, in a MS PowerPoint presentation on World War 2, pupils used both hyperlinks and auditory links. The range of resources that have been produced by pupils could be used to populate a school intranet.

Experiences with broadband access

The school has had a positive experience with broadband access. The 10Mbps link is now reliable, and there is access whenever it is needed. Libraries are also linked to this facility through a borough provision. A disadvantage that the school finds is that broadband facilities take 27% of the NGfL fund to provide access and maintenance.

Broadband access and content

The school uses a wide range of software, supported through broadband access. Espresso is used as a cross-curricular resource – it is found to be useful, and frequency of use is now growing, whereas it was previously limited. Black Cat software was bought as a package through arrangements made through the LEA. It is found to cover the ICT curriculum, and is found to be useful. The school has also bought into a Kar2ouche purchase, and is to gain staff training on the resource. With regard to bulk purchase, it is found that this can sometimes be slow. For example, this was found to be the case with interactive whiteboard purchases.

Additionally, the school uses resources that are available on the internet, pictures of Everest, for example, and NAACE resources. Most staff look for resources on the internet. There is currently no shared favourites or a shared work area across the school. Any sharing is done through the ICT co-ordinator. It is found that the LEA share resources that they have access to, and have provided links to Grid Club, and the BBC site, for example. The school would welcome having access to a wider shared favourites area, organised by year group.

The school has some specific software packages, such as the Virtual Experiments CD-ROM (produced by Collins). It is found that the interactive whiteboard allows useful forms of interaction with resources such as these. It is possible to see experiments being carried out, and then to carry them out in practice. It is found that pupils work more independently as a result. Seeing the experiment first means that pupils are not just following instructions. The only other alternative would be for pupils to follow a demonstration with a practical experiment, but this would be less effective in terms of seeing the experiment with ease, and would be more time consuming.

The interactive whiteboard is used for the demonstration of ICT skills, for example, showing a year 2 class how to use Fresco (an art package). Teachers find it easier to introduce a skill or topic in this way, and pupils can easily then use the skills or topics they have seen (for example, transferring a formula across cells). It is found that this form of visual demonstration works effectively. When pupils follow these demonstrations they also take notes in the form of flow charts (which are written into notes that they can refer back to).

Pupil uses of ICT

Pupil uses of ICT are supported through an appropriate scheme of work. Foundation stage pupils do not use laptops, but do use computers. Where possible, pupils are given opportunities to become increasingly independent, and to support each other. For

example, year 1 pupils are supported by year 6 pupils in class, when logging on, or performing other functions. It has been found that this has worked well, and such support has also enabled a supply teacher to cover the ICT curriculum on occasions.

ICT work on display around the school shows how the ICT is supporting other subject areas. For example, in some year 4 work, poems illustrated with pictures and borders, showed a clear relationship between the image and the fine choice of font (a butterfly and choice of a tracery font, for example).

Pupils gain experience of communicating with other pupils in other parts of the world. Pupils have e-pals in Quebec, and they have sent MS PowerPoint presentations to the pupils in Quebec. These presentations contained digital images, taken using a digital camera. It is reported that some pupils are more independent as a result of using ICT, including pupils with special educational needs.

The mobile interactive whiteboard is used to support specific aspects of pupil learning. In year 1 there are 9 pupils with specific language concept limitations. Using a data projector, it is possible to write a story as the pupils 'tell it'. The teacher (an ex-head teacher who is well used to working with ICT) talks about the story and types up the story as it emerges. The story is clearly visible all the time, to all children.

Links to uses beyond the school

The school has links with the local library. The library is central to the local community, located next to the shops. Computers for pupil use are positioned near the children's area in the library. The ICT co-ordinator feels that there is no issue in encouraging use of ICT outside the school, as access is not a major issue, since pupils have access either at home or in the library. The school is soon to run a home survey to find out more about ICT access, with the intention of looking at how to support pupils with limited access. It is felt that perhaps 50% of pupils have access at home.

The librarian oversees the children's computer access in the local library. There are three computers specifically for children's use, for children up to the age of 13 years. All local libraries provide the same forms of access across the borough. The library layout means that the children's area can be separated from adults. To use the facilities, children must have a parent/carer authority. The children's area is protected by a strong firewall, and it has been found that this can be sometimes limiting. The library has a range of on-line CD-ROMs, including six items for under 5 year olds.

Many pupils use the library facilities. Pupils from 6 primary schools and one secondary school are known to use the facilities in one local library. Free access to the internet is provided, and there is an Ask Jeeves search facility for children, but no Google access. Use of the facilities is high, with perhaps 80% use at any one time during holiday periods, and an average 50% use overall. On Saturdays the facilities are usually booked completely. Children are allowed access for one hour maximum, and during the evenings many pupils come in to do their homework. It is found that most pupils have a library ticket by the time they are of nursery age (year R). Traditionally many pupils have used the library facilities routinely to do their homework, but it is felt that perhaps more now do homework at home if they have internet access. Children are allowed 5 free printouts for homework (in black and white), and colour printouts are charged at 50p per sheet.

The librarian generally encourages pupils to use computers and books. There are currently 315 children and 294 teenagers who are registered as members to use the computers. Children generally need to book because of the high demand. Pupils of all abilities use the facilities, some with specific learning needs. Some children have been barred from use (5 currently, with the youngest being 12 years of age). On occasions the library has had to close in the evenings due to vandalism, which clearly reduces access for some children.

About 50% of pupil time on the library computers is used for homework in term time, and less in holidays. It is found that not many play games (and it is felt that this is due to the fact that they may get bored). Only one child is allowed on a computer at a time, and this tends to support more positive behaviour. The use of the computer is recognised by library staff to be helping the behaviour of some pupils – one pupil particularly. It is known that there is a lot of use from pupils at one school (but these pupils tend to be the least well off financially in the local area). Pupils cannot use email in the library and cannot access their work on the school servers, although the pupils in colleges can do this.

The libraries are all networked. The hub is linked to the health centre and the housing office as well as to schools. All connected sites have access to MS Office applications, and to the internet.

ICT in the future

Pupils have access to ICT in the school several times a week. An issue for pupils and for schools in the area is that this may not happen when these pupils move on to secondary school. The school is concerned with how it can maintain ICT facilities and develop forward with ICT, and feels that there is a real need for a long term financial commitment to ensure that this can be undertaken.

Case Study 13: Developing e-learning from a limited starting point

Summary of key points from an e-learning perspective

9. The school has moved in a short time period from a position of ICT being a weakness, to ICT being used in a varied way to support pupils across the school.
10. The ICT suite has enabled staff confidence and use to develop, as well as pupil access and use.
11. The head teacher has been a key champion, and has provided a significant lead for the ICT development across the school. Responsibilities for further development are now being shared through other staff members.
12. Reliable high bandwidth broadband access has supported the use of ICT resources by pupils and staff, and there is reported evidence that pupils are beginning to become more independent in terms of their learning, due to the opportunities being provided.
13. The support of the LEA, both in terms of technological provision, and advice and guidance, is positively acknowledged and recognised.
14. Reliable internet access is leading to significant use for research purposes. Staff and pupils want to increasingly widen their access to useful web sites, and any LEA initiative to support the creation of a favourites list by subject and topic would be welcomed.
15. Pupils report the wide uses of ICT resources, to support a variety of learning needs across subject areas. However, uses of ICT to support literacy and numeracy are reported less often than those in other subject or topic areas. Although some pupils recognise the value of ICT in writing, for example, others do not. Pupils may need to be shown the added value that ICT offers in specific learning contexts.
16. Use of broadband to support communications, for teachers, for parents, for pupils outside school, through video conferencing, or through shared portfolios, has not been developed at this stage. However, pupil uses of ICT outside school, and parental support and interest in ICT, suggest that these avenues would be worthy of a future focus.
17. The head teacher has ideas of future ICT developments that would appear to be consistent with the interests and developing aptitudes of pupils, parents and staff.

School background

The school provides for pupils aged 3 to 11 years, in a mixed catchment area on the outskirts of the LEA. The head teacher has been at the school for 2½ years. Parents are recognised as being supportive. More than 5% of pupils are entitled to free school meals. When the last Ofsted inspection was undertaken, a PANDA comparison to other similar schools showed that the school was under-performing. ICT was a subject area that was recognised as under-performing.

ICT background

In 2002 the school had a few old machines, at the level of about 1 machine per classroom. It was recognised at that point that some pupils were ICT literate, but that their ICT literacy was being developed at home, rather than at school.

The head teacher sought advice from the LEA, to look at how to create an ICT suite (so that ICT could be taught), and how to develop staff expertise (as there were no keen individuals on the staff at that time who wanted to develop ICT use).

The school acquired a computer suite, which was found to be supportive of the staff in terms of helping their professional development. The school was able to run whole staff training using the suite since it also contained an interactive whiteboard.

ICT and the curriculum

The ICT suite is timetabled for use by every class. The QCA scheme of work was introduced as a means to support class teaching. Teachers are increasingly adopting the scheme in their class teaching. The head teacher ran upper Key Stage 2 classes using a team teaching approach last year, but this year the teaching has been done by staff on their own. The school is delivering about 50-60% of the QCA scheme currently. The head teacher is trialling self-assessment of ICT, based on a skills model. The head teacher feels that pupils are clear about what they can do in terms of ICT.

Morning use of the ICT suite is blocked in the timetable for literacy and numeracy. It is recognised that the ICT suite is only being used for about 50% of the time possible at the moment. Literacy Box and Numeracy Box have been used in the past during these times, but are not being used a great deal currently - linking use to planning was found to be an issue. This issue is currently being addressed. The head teacher has recently run training on this, and staff were found to be enthusiastic about what they saw. The school has access to a range of ICT resources, including a local history archive – some 80% of the QCA history unit is now done online using this resource.

The ICT suite has been used widely by staff as well as by pupils, and is used regularly at 4.30 p.m. every day. Staff discussion about teaching use and learning has been generated through use of the ICT suite and resources. The school now has an ICT co-ordinator, and a classroom assistant has been appointed to support ICT use in the classroom.

Experiences with broadband access

The school has found the 10Mbps broadband access provided by the LEA to be 'impressive'. Although there were downtime periods at earlier stages, this situation is no longer experienced. Improvement of access is not an issue for the school. The school has broadband access for 24 hours a day, and quality of access is not found to be dependent upon time of day (other than when maintenance is being undertaken). There is currently no linked broadband access in homes.

The impact of reliable internet access has meant that there has been an increase in the range and use of teacher resources. Useful web sites have been located increasingly, and resources such as Mandarin have been found and used. In terms of impacts on teaching and learning, it has been recognised that pupils are using internet access for research purposes increasingly, and that they are becoming increasingly proficient in narrowing their searches, and being more accurate in their search for detail. It is found that pupils are researching more themselves, and are becoming more independent in terms of learning, and finding their own ideas. For example, the head teacher ran a lesson recently on Wales and St. David, and pupils found different web sites, which led to sharing and discussion. Many of the nine-year-old pupils in the school will now go to the internet to find something out without questioning whether this avenue should be considered or used.

At this stage there have been no recognised impacts of broadband access on improved communications, or teacher or school efficiency. Uses of video conferencing have not been explored at this stage. Community and home links have not been explored at a technological level at this stage (although the head teacher ran a parent workshop recently). This workshop ran for 3 hours (although only 45 minutes was planned). Parents were shown the software that the school uses, and how teachers and pupils use it.

Broadband access and content

Broadband content has been widely used in the school, but additional web links are increasingly sought. The support of the LEA is recognised, and the head teacher would welcome further LEA initiatives, such as producing a list of useful web sites. If the LEA internet data records could be sorted according to learning and subject category, then it is felt that this could provide a useful source for a favourites lists.

Espresso has been the main curriculum content that has been used across subject areas. It has been found that little new material has been added to the Espresso resources. It is felt that there needs to be more resource added to maintain challenge and motivation of pupils. It is found that staff generally like the resources available through Espresso.

The greatest use of broadband content resources has been in ICT lessons, and use of Black Cat resources has also helped to support curriculum needs. It has been felt that the ICT suite has supported well the use of this range of curriculum resource.

Pupil uses of ICT

An observation of a year 5 class showed that all pupils were highly adept at using ICT. The program being used for the session was Mission Control. Pupils remained on task for the session, and although each pupil used a workstation on their own, they used opportunities to discuss strategies to tackle the needs of the program. The pupils used head phones to receive instructions, and the challenge was to save the rain forest. Pupils were continuing from where they had got to in their last session. Generally the pupils have access to the ICT suite once a week, but were able to gain access each day during this period. Pupils reported that they found the Mission Control program 'quite fun and challenging', and 'quite hard'. Pupils reported that programming was challenging, but some pupils felt that 'for most actions you need to program computers'. Others enjoyed the logic involved.

Pupils reported that they experienced and used a range of resources:

- Internet access, for research (reported being used once a week at school, but every day at home by some pupils).
- Logo using Black Cat software.
- Spreadsheet functions using MS Excel.
- Kar2ouche.
- Fresco (an art and drawing package).
- MS Word and clip art for stories and reports.
- Mathematics games.
- Games such as Gnomeball and Ball Throwing.
- MS Publisher.

Pupils reported that the resources they enjoyed using most were:

- Internet access (both by boys and girls).
- MS Word (by boys and girls).
- Learning about ICT generally (which both girls and boys felt was useful).
- Fresco (by girls, which they considered to be an ICT version of painting).
- Kar2ouche (by boys, which they considered to be a game with a learning experience).
- Mission Control (a favourite game reported by boys).

Some pupils reported that certain programs helped them, but they were not able to report any specific instances of how they had been helped. This might suggest that pupils need to be shown how ICT supports their learning more specifically in some cases. However, this was not the case for all pupils. Some girls reported that they felt it was more useful to write using the computer, because there was no crossing out left on the page, and writing by hand made their hand hurt. They felt that writing using a computer was not reducing their ability to write by hand. Some girls reported that they were using MS Word outside school, to write invitations and reports. They would like to have greater access to ICT in school. It appears that pupil interests and aptitudes could be developed further if greater access could be accomplished within the school.

Some girls were using games such as Gnomeball adeptly, and felt that their success with the program was helped by their outside ball game abilities (rather than it being the other way around). It was also clear that not all boys were fully successful in terms of tackling certain games' aspects. For example, one boy was thinking in terms of straight lines, rather than seeing the use of diagonals as a means of tackling a problem. It is not clear that he could have identified this alternative without being able either to see others using this technique, or by asking others, or by being shown this technique by the teacher.

ICT in the future

The head teacher would like to invest in interactive whiteboard facilities in the future. The school currently has data projectors and static whiteboards, but only one interactive whiteboard in the ICT suite. The head teacher is also considering the role of ICT within a curriculum room for staff - for use in workforce reform time.

Case Study 14: Benefits arising from use of PDAs in literacy

Summary of key points from an e-learning perspective

9. The school has developed ICT uses across the curriculum over a period of some years. The head teacher supports ICT development, the ICT co-ordinator focuses on teaching and learning aspects, a technician addresses technical issues, and central software procurement and broadband access and support from the LEA are brought together in an integrated way.
10. Teaching and support staff all have laptops, and ECDL courses are available for staff. Specific training is run that is appropriate to the particular needs of the staff group. The school runs a UK Online Centre, and provides courses for parents as well as staff.
11. Resources in the school include an ICT room, computers in each classroom, data projectors in many classrooms, laptops, and PDAs. Resources are deployed as appropriate to pupil needs, including the use of PDAs with specific pupil groups, and an interactive whiteboard is used in a resource base to support pupils with mild learning difficulties.
12. Both pupils and staff have access to their own portfolios, and sharing of work and access to work is easily possible within the school (and outside the school for staff). The use of such facilities is reported to be beginning to impact upon staff accountability, staff communications and teacher efficiency.
13. Use of PDAs last year with a group of year 6 pupils who started the year with uncertain level 4s in English, was a success. All pupils attained level 5 in the SATs tests at the end of the year, and it was felt that PDA use could well have contributed to this success.
14. Specific benefits of ICT use are identified and focused on in specific subject lessons, and in specific activities, including out of school activities such as a French Club.
15. Broadband access and reliability have meant that teachers have used ICT without reluctance. Pupils are beginning to recognise the benefits that ICT and broadband access can offer them. Visibility and clarity of writing are highlighted as benefits when teachers use data projectors. Visual and sound aspects are felt by pupils with mild learning difficulties to be important in terms of supporting their learning with appropriate resources with an interactive whiteboard. They also noted that teachers are supporting their listening more with this resource.
16. Parents are supported in ICT terms through a range of initiatives. Future involvement of parents is on the agenda of future initiatives.
17. Key questions for future developments in ICT are likely to be concerned with monitoring, integration, and sharing practices.

School background

The school is 3 form entry, taking in some 90 pupils each year, and currently has some 360 to 370 pupils on roll. The school contains a resource base for pupils with mild learning difficulties.

The head teacher is supportive of ICT development, and the ICT co-ordinator focuses on teaching and learning aspects rather than on technical issues. This focus is supported by the school employing a technician and buying into technical support provision. A stated focus for ICT development generally is to put ICT at 'the heart of the lesson'.

The current ICT practice in the school has been developing over some years. The previous head teacher and the current ICT co-ordinator visited Australia as part of an LEA initiative to look at ICT practice. There they saw pupils deciding when to use ICT, and they adopted that vision for the school – a vision concerned with pupil empowerment. The present head teacher is driving forward both the teaching uses of ICT and the learning uses of ICT. Staff are supported in this endeavour. For example, staff can take the ECDL course in the school's UK Online Centre, and the school is a SLICT host school.

The school does not work in isolation. It is supported by a range of services from the LEA. It is felt that the support provided by the LEA is effective. Central procurement and other services are well received.

ICT background

Originally computers were based only in classrooms. When the previous head teacher came to post, he created a computer room with a network. The purpose was to raise teacher skill levels. He wanted to move ICT practice from just being concerned with word processing. The computer room was set up with 20 machines for paired work. There are now at least 2 computers in each classroom, plus 28 computers in the UK Online Centre, plus 40 laptops. Seven of the 40 laptops are located in the ICT room. There are 11 teaching spaces that have data projectors, and others are planned for deployment this year. There are good quality speakers in rooms, so that sound-based resources can be heard easily. The school has one interactive whiteboard for use with pupils with moderate learning difficulties. The focus of use of this resource is on mathematics. This focus is felt to have worked well. There is a computerised lending system in the library.

The visit to Australia revealed that all teachers there had a laptop. Following the visit, laptops were provided for all staff in the school, and they were offered training based on ECDL. This training was needs based, and different groups were supported in different ways. Classroom assistants and teaching assistants were provided with laptops too. Classroom assistants and teaching assistants can take the ECDL course, but take training appropriate to their needs, which is different from the training for teaching staff.

Servers are set up so that hard drives are shared. There is a pupil area, and each pupil has a separate portfolio. Staff have portfolios also. In a shared area all planning is undertaken; it is not done on paper. The whole school network provides access to over 100 machines, and the access is provided for any user at any workstation. Internet access is open for all via the LEA firewall. SchoolMaster can provide access also. It is recognised that adequate infrastructure is now in place, so it is possible to work in innovative ways.

ICT and the curriculum

Teachers use ICT across the curriculum. In moving forward to address this focus it was found that it was necessary to consider planning and accountability in some depth. Discussions on this with staff were focused on uses of ICT reducing workload. It is reported that more shared responsibility is beginning to arise as a consequence of this focus. It is felt that there has had to be a more collaborative approach to accountability in order to reach the present position.

The school is involved in a number of initiatives that impact upon the curriculum, such as a local borough development, focusing on PHSE and citizenship. A PDA project run last year was part of a Becta pilot. The school received iPACs that were given to 12 pupils in last year's year 6. The pupils had these for 1½ terms before they took their SATs. All pupils attained level 5 (even though they were all initially 'wobbly' 4s) in English. These levels were higher than those gained in other previous years, and it was felt that the use of the PDAs had contributed to this outcome. Staff and pupils reported how they had identified how to use this resource for curriculum advantage in literacy. The pupils took great care of the iPACs, which have now been given to year 5 pupils (for 2 years of use for literacy work). The school is seeking to become part of an LEA project where class sets of Toshiba machines are available in 3 schools. These machines will be used with year 4 pupils. Resources such as Espresso will be provided on these Toshiba machines.

Specific benefits arising from the use of ICT have been identified in certain subject or topic areas. Group story approaches have been used in some classes and have involved using ICT. ICT has meant that pupils could see the story immediately, and pupils could see errors immediately. It has been found that the internet has been vital for providing teaching resources, particularly using those on the BBC web site. It is intended that pupils take more ownership of the internet, and that they work increasingly more independently in the future. Some internet resources have been identified as being particularly useful, such as science investigations where long preparations are involved in setting up experiments. For such science experiments, it is now possible to run a simulation. A simulation focuses on the point of the experiment, so that more attention can be given to thinking about purpose and results. As a consequence, it is felt that there is a greater need when using ICT to be sure of objectives, and to be more focused on this.

ICT is used to support out of school activities as well as in-school activities. The French Club that is run after school involves the use of ICT, for example.

Experiences with broadband access

All classrooms have access to a 10Mbps broadband facility. Only occasional breakdowns have been experienced. Performance is not determined by the time of day, and no performance issues have been experienced in the school's mobile classrooms. As a consequence of the reliable access, teachers now use it without reluctance, particularly in the ICT room. Teachers also have access to the internet generally at home.

Communications involving video conferencing have not been explored at this stage. However, the broadband access available already is felt to be leading to improved communication. It is recognised that more sharing is happening, and that there is a higher level of accountability being accepted, for example, when items have not been produced or are not presented within shared areas as previously agreed. In this way it is felt that there have been impacts on school efficiency.

Broadband access and content

Content that can be used through broadband facilities has been widely accessible, and Espresso particularly has been used a great deal in the school. Espresso has been used to support literacy and numeracy particularly, but also for history and geography. Black Cat software and Kar2ouche are also used.

It is felt that data projectors have had an enormous impact upon teaching and learning. It is felt that the cinematic learning approach has had impacts for teachers and pupils, and that lessons have become more interactive. Uses of PDAs have also been identified as being particularly important, in that they have provided access and opportunity when and where pupils have wanted it.

Pupil uses of ICT

A group of 4 boys and 3 girls, all from the same year 5 class, described their uses of ICT. They are all involved in the 2nd year pilot with PDAs. They say they use these most of the time for work with times tables and spellings. They use them also for literacy work, for writing notes about characters, and for creating stories. The work with times tables involves them looking at these and remembering them. They feel that the PDA is better to use than a book, that it is neater, and that it is possible to choose font, size, or colour. The PDAs fit into a cradle to print off work, which is done once a week, for it to be put into their books as a record. The pupils prefer using a print off for teachers to mark, and they keep the teacher's marked work. The pupils find that the PDAs are used every day, for half the day or for the whole of the day, for literacy or mathematics. They are used for history and geography also, but not for science or art. Pupils decide when to use the PDAs, not the teachers. They can use the TV facility to run video, and would like to access the internet on them, which is not accessible currently. They can download music, pictures, backgrounds, and games (such as Solitaire or Sonic). The pupils find neither the size of the PDA nor the screen size to be limiting in any way. They would be happy to use the PDA for reading a book. Pupils keep words on it and some seem to check these regularly. The calculator facility cannot be used for some lessons, and not in tests.

The pupils with PDAs also experience the use of a data projector in class, for mathematics, for seeing DVDs, or for use of Flexi-cam, for example. They find it easier to see things on it than they would on standard boards, and prefer the use of this facility to teachers' using other boards. They find it easier to read the teacher's writing when the teacher does not write by hand.

The Resource Base for pupils with mild learning difficulties has been recently equipped with an interactive whiteboard. Four pupils were observed using these facilities, all from year 4 or 5 classes, two boys and two girls. They were using a game where they had to work against the clock – they had to stop the clock, beat the clock, ready, steady, clock. In this activity they had to stop the clock to stop losing lives, and to do this they needed to touch the board. The activity involved work with times tables. Pupils say that they use these types of activities only at the beginning or at the end of lessons. They enjoy them because they are visual, such as having to guess the picture on an Espresso activity. They say that some have sounds too, that the video has sounds, and some games ask questions. They say that sometimes the activities cover the same topics that are done in practical ways, with boards, using mathematics topic papers, mathematics folders, worksheets, or tickets. When asked about the features of the interactive whiteboard that they thought were important:

- Visual aspects were mentioned by 2 girls, and 2 boys.
- Hearing was mentioned by 2 girls, and 2 boys.
- Touch was mentioned by 2 girls, and 1 boy.
- Movement was mentioned by 2 boys.

The pupils said that the interactive whiteboard ‘talks’ more than the teacher, and gives more information. They said that with the interactive whiteboard, the teacher helped them to listen.

Links to uses beyond the school

The school has been involved in projects involving ICT that have involved family members. They have run a family learning project, focused on literacy. They ran a session for one hour with parents, then a one-hour session with parents and pupils. In a new pilot involving the use of PDAs, parents would need to work with these PDAs with their children.

The school supports parents through courses run within the school. The school runs a UK Online Centre, and employs a tutor specifically for this purpose. Over 100 parents have gone through the centre and been involved in courses, with between 8 and 20 parents involved each term. Many parents prior to the courses had no previous ICT skills. The school has achieved ‘Investor in Parents’ status.

ICT in the future

With the width of practices in place, and being developed, some key questions for the future are likely to be:

- How will ICT use be monitored across the range of initiatives and practices?
- How will all the pieces be viewed so that they can be considered from an integrated perspective?
- How will staff take different needs and initiatives on board?
- How will sharing be encouraged and implemented across the staff?

Case Study 15: Supporting pupils with specific behavioural needs

Summary of key points from an e-learning perspective

1. The school has moved forward significantly in terms of the uses of ICT to support pupils over a 4-year period.
2. ICT is widely accessible to teaching and support staff in the school, and to pupils within the school. Integration has reached a point where all staff and pupils are involved in active uses of ICT.
3. Staff create and use ICT resources regularly, and communication between staff is not only being supported by ICT, but broadband is being seen to have impacts upon the width and quality of resources being used.
4. It is felt that ICT has contributed to improvements in attainment being recorded for pupils. This contribution appears to be driven both behaviourally and intellectually.
5. Broadband access and procurement of resources through the LEA have been well received, and have been successful from the point of view of the school.
6. Some parents are beginning to communicate with the school electronically, but most links for parents and pupils externally would be developed at future stages.
7. The use of MS PowerPoint, video and digital imagery, and a range of specific learning resources such as Clicker 4, are seen to have positive impacts upon pupils' engagement and learning. Interest and engagement is being supported through the use of resources that provide an immediacy of recall.
8. Interactive whiteboards are used widely, and certain features can have direct impacts upon engagement, and involvement. Turn taking, contribution, and positive behaviour are all supported with features that interactive whiteboards offer, such as visibility, clarity, and hide functions.
9. ICT resources such as a remotely controlled car are used to support characteristics of positive behaviour such as patience, tolerance and turn taking.

School background

The school caters for pupils with severe learning difficulties, as well as associated behavioural and emotional difficulties. There are currently 55 pupils in the school, and some 20% have autism. The school runs an autism outreach service. The head teacher has been at the school for 4 years. The school was put into special measures prior to his appointment.

The school environment is particularly attractive and engaging. It has been carefully created, and is well maintained. There are notices and displays around the school that have been produced using ICT. There is an art gallery, and a large sculpture in one area. The school had four artists attending during last year, and all pupils provided an input to the sculpture. There are play and garden areas outside the school buildings.

ICT background

The school now has at least 2 computers in each classroom, which are networked. There is additionally a small computer suite, and all pupils are timetabled to use it. There are interactive whiteboards in all classrooms and in the hall.

The deputy head teacher was also the ICT co-ordinator in the school. He ran a great deal of in-service training for staff, including support staff. ICT training was included in the

induction of special support assistants. Support staff can deliver lessons when teachers are out of school (for example, when an advanced skills teacher is out for one day a week). There has been a small staff turnover for the past 4 years, which has helped with the embedding of ICT. Nursery nurses are well involved in the integrated approach to ICT. One nursery nurse develops resources with subject leaders. Another nursery nurse is trained in the use of Soundbeam technology, with music used to support communications.

All teachers have laptops to prepare and plan in advance. Teachers store the ICT resources they create and use on the network, and this includes a large number of teacher-produced MS PowerPoint resources. MS PowerPoint resources have been created over the past 18 months. Overall, teachers use ICT in a wide variety of ways. The school have run some professional development sessions for other schools, in other LEAs.

ICT and the curriculum

ICT is recognised as being embedded in school, teaching, and learning practice. In the most recent Ofsted report, the ICT use was recognised as being 'outstanding'. It is recognised that exemplary practice has been developed within the school. Last year 40 pupils made an improvement of one P scale in at least one subject. The head teacher feels that this was due to some extent to ICT.

The head teachers feels that interactive whiteboards have improved behaviour, concentration, and engagement. He says that a few years ago both he and the deputy head teacher would have been tackling behaviour issues, but that now there are less challenging behaviours and fewer behaviour instances to tackle. He feels that interactive whiteboards allow pupils to interact more. For example, the register is delivered through the interactive whiteboard.

Experiences with broadband access

The head teacher says that the broadband access to the school has been 'fantastic', and reports only occasional downtime. Broadband access is possible across the entire school, and there have not been any noticeable differences in quality that are due to times when resources are accessed. Access beyond the school, into homes, has not been developed at this stage, but there are 5 parents who have requested e-communication with the school, and this has been accommodated.

The impact of broadband access on communications is beginning to show at this stage. Although there is no development yet of video conferencing access, there is wide sharing of resources by teachers. Each member of staff has a separate folder, and these are used for storing and sharing resources. Improved communication has been demonstrated by the level of sharing that has happened. Teacher and school efficiency have been felt to be improved as a result of the different resources now available to teachers, and as a result of the improved quality of those resources for teaching and learning purposes.

Broadband access and content

The LEA based arrangements for procurement of broadband content have been well received, and have worked well in practice. Espresso, 2Simple, and Kar2ouche resources have been provided through this route. Some staff use these resources widely.

The head teacher feels that the combination of resources now accessible and the levels of staff expertise available have enabled the adoption and emergence of innovative and

creative approaches to SLD practice. Of particular note are the practices associated with uses of MS PowerPoint, video and digital imagery. Uses of MS PowerPoint and video in assemblies mean that pupils are now 'transfixed'. Digital imagery allows events to be captured during any day, so that these experiences can be related to pupils in assemblies. Images of all visits are now captured, such as visits to shops, or to the airport in Birmingham. Images of inclusion in mainstream schools are also captured. These images allow pupils to relate to events, situations and circumstances much more strongly because of their immediacy. More immediate recall means that pupils can relate more easily, whereas previously recall would have needed to rely on more distant memory or on the imaginations of pupils entirely.

Pupil uses of ICT

Pupil uses described here are from observations and discussions in two class areas.

All pupils in a year 5 and 6 class use the internet and surf using Google. There are a number of pupils with autism in this class, and they work at a year R level, at P6 on the P scale. The teacher uses the interactive whiteboard, Clicker 4 and MS PowerPoint to support teaching and learning with this group of pupils, and a range of resources such as the Dorling Kindersley Round the World resource. The head teacher feels that the spatial 'feel' of the interactive whiteboard is important in helping these pupils. The interactive whiteboard is felt to create a positive dynamic in terms of ethos:

- It gives constant clarity.
- It moves pupils away from using an individual standalone machine, where obsessive use can occur.
- Use of standalone computers and a computer screen would tend to lead to behaviour problems.
- The interactive whiteboard enables pupils to wait more easily, because they can all see clearly what is happening.

An observation of a class of year 5 and 6 pupils showed how the use of interactive whiteboard technology is supporting teaching and learning in an SLD environment. A story was displayed on the interactive whiteboard, and the teacher was reading the story (with images). Pupils responded with interest, and interest was maintained when the teacher made gestures to accompany certain words. The teacher finds that the interactive whiteboard helps to motivate pupils with reading. Planet Wobble resources are found to be useful for this, as Big Books are not easy to use with SLD groups. The size and visibility of the book on the interactive whiteboard help, and so perhaps does the fact that the book is not moving or shaking, because it is not being held by hand.

After the story had been read, the teacher used Clicker 4 to form a background while asking questions of the pupils. The teacher created two lines of a poem using Clicker 4. Then a pupil came to the interactive whiteboard to create two lines of a poem using the software resource. The teacher put 'commas' in to make the story more readable. The teacher gave lots of encouragement to the pupils, and each pupil created two lines of a poem using Clicker 4. Once all the pupils had entered their two lines, the teacher ran the programme to put in additional elements, such as the title. Two pupils suggested titles – and this led to a potential problem with choice, because of the autistic child's desire to have only his title accepted. This issue was resolved by using the interactive whiteboard to hide the second title. After the poem was completed, the poem was printed out.

The use of the interactive whiteboard was felt by the teacher to have had an impact on turn taking with this group, with how they approached the writing of the poem. Turn taking is an aspect that this group find difficult to manage. ICT is used with this class both to support learning, and to provide rewards. For example, 5 minutes are allowed on the computer at the end of a successful lesson (this is timed with a 5 minute timer).

In a session with year 2 and 3 pupils, a remote controlled car was used to support learning. The teacher went through the instructions of how to use the car. Engaging these pupils was clearly a challenge, as they could be easily distracted. The teacher explained that she was wearing the hat (and this showed that she was also driving the car). A boy gave instructions to the teacher of where to drive the car. All children could see what was happening with the car moving in the hall, and all pupils waited patiently. After the teacher drove the car, the boy was given the hat, and the teacher gave the instructions of where to drive the car. The teacher then showed an instruction strip that had been created previously by the pupil and the teacher on the computer. Another pupil was then asked to drive the car, following this instruction strip. Each pupil took it in turns to do this. All pupils waited patiently for their turn. Pupils remained amazingly patient, even though there appeared to be little to engage them. Some pupils became distracted after about 20 minutes and sought other stimulation. The horn of the car helped to keep attention from this point on. The teacher then introduced 4 cones for the car to move through on the floor, and a boy told the teacher what to do to control the car.

At the end of the lesson the teacher reviewed the objective of the lesson - following instructions. The teacher said that the dynamics displayed by the pupils was very different from how they started at the beginning of the year. She said that the use of ICT was important in this. The teacher focus since the beginning of the year had been on co-operation and collaboration, turn taking, with the use of rewards. It was felt that there had been a cumulative impact of ICT on behaviour after a period of 10 to 15 weeks. Interactive whiteboards were used for all of this time, and they were felt to have played a significant part in this.

ICT in the future

In the next phase of development it is intended that all nursery nurses will have laptops.

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