



# Home-School Links and ICT

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## SECTION ONE

### BACKGROUND, OBJECTIVES AND CHARACTERISTICS OF THE LITERATURE

#### 1.1 Background to the report

This desk-based research was conducted during the early part of 2001. It seeks to compliment the DfES-commissioned research undertaken by Manchester Metropolitan University (MMU), which was managed by the Practice team within Becta.

In general, home–school links, whether focusing on ICT or not, is an area in which the DfES has demonstrated significant interest by commissioning and monitoring research, not least because there is evidence to suggest that such links are beneficial. Furthermore, work on the current ImpaCT2 and Pathfinder evaluations have identified a number of interesting issues relating to home–school links in addition to those investigated by MMU as part of the recent study.

This report initially provided an effective data resource for internal use and for use by the DfES, and materials contained herein are drawn from the documents included in the 'Bibliography and source documents' section at the end of the report. The work has now been made available to a wider audience on the Research area of Becta's web site. It also has links to other projects that the Evidence team in Becta is undertaking, namely with regard to the 'Digital Divide' and 'Portable ICT devices' in education.

#### 1.2 Objectives of the review

The objectives of this report are to:

- ♦ Describe the approach to the literature search and source identification.
- ♦ Provide an overview of the ideas behind home–school (and school–community) links, and discuss why these might be important for education and learning.
- ♦ Discuss the ways in which and associated network technologies might already be impacting on the relationship between home and school – for example, through unmediated access to educational resources.
- ♦ Provide an introductory overview of the technological aspects of ICT-facilitated home–school links.
- ♦ Identify examples of current software and internet content relevant to home–school links, noting innovative ICT-facilitated home–school links projects.
- ♦ Identify ICT-facilitated home–school links initiatives and any research evidence that suggests their effects for teaching and learning, and any related issues for consideration with a view to models of use and effective practice.

- ♦ Attempt to draw together the research and recommendations for best practice from both the wider home–school links literature and that pertaining specifically to ICT, to identify the most important aspects in creating effective initiatives
- ♦ Suggest gaps in the research and suggest areas for further investigation.

### 1.3 Characteristics of the ICT and home–school links literature

During the approach to data collection (see Appendix for further details) and assessment processes undertaken during this study, a number of trends in the 'ICT home–school'-related literature were identified. At the time of writing, relatively little data, and in particular research literature that evaluated the impacts of ICT-supported home–school links, was in evidence. Many research papers consider home–school links utilising ICT, but very rarely are these links the specific focus of study. A number of articles also illustrate that ICT can improve the 'learning potential' in the home due to the increased number of learning materials ICT can provide access to. What is more, many also focus on the extent and diversity of children's use of ICT in the home and the possible implications for schools. However, little research has focused specifically on the impacts of ICT to link between the two locations, due in part to the fact that it is a relatively new area of development.

More generally, there exists a much broader range of literature that discusses the possible meaning(s) of 'home–school links' and a wide body of data evaluating relationships between the home/family/community and the school and subsequent impacts. School effectiveness and school improvement literature, particularly from the US, has also been drawn upon. Much of this material evaluates the relationships between home and school for different groups, often using case study material and highlighting good practice, especially that which has proved effective in increasing attainment and motivation.

There are also a number of articles (in particular newspaper articles) examining the trend towards home education, relating it to the growing availability of educational resources through ICT and especially the Internet. Key statistical data from a range of sources is available, which has helped in establishing the type, level and specific usage of ICT in the home.

A fuller account of the approach to the literature search and source identification can be found in the Appendix.

## SECTION 2

### EXECUTIVE SUMMARY OF MAIN FINDINGS AND CONCLUSIONS

There is a relatively limited research into specific ICT-supported home–school links. Much of what is available focuses on different aims and objectives, and incorporates various technologies. This makes it difficult confidently to conclude that ICT-supported home–school links have a positive impact on learning. However, if research findings from the wider research into home–school links and the broader ICT in education literature are considered together, a powerful case can be built to suggest that ICT can play a positive role in effective home–school relationships.

There has been an increase in emphasis on home–school relationships. Research findings suggest that home–school links can be effective and are a significant factor in school improvement, and Government policy is encouraging co-operation between home and school. The academic literature in the fields of educational psychology and the sociology of education and childhood have also paid significant attention to these relationships, focusing in particular on the individual's active construction of socially and culturally situated knowledge.

Research has identified that home–school links can have a range of beneficial outcomes, including:

- ◆ improved academic standards
- ◆ increased engagement with homework and other schoolwork
- ◆ greater parental involvement and building of collective social capital
- ◆ mobilising and drawing upon expertise from a wider pool of individuals and groups
- ◆ building better lines of communication between parents and schools and also the wider community
- ◆ increased feelings of empowerment and ownership amongst family members, particularly when consulted in planning and implementation stages.
- ◆ promoting of self-esteem
- ◆ reducing social exclusion
- ◆ increasing school interest in other areas of family need, and better understanding of family circumstances, needs and requirements.

Whilst some benefits may have a more direct impact on educational standards, the affective and social advantages that result may be just as important. However, encouraging such benefits and creating such reciprocal and effective exchanges may subsequently increase knowledge and co-operation surrounding learning objectives. This may in turn enhance the chances of raising academic standards.

There are a relatively small number of research papers that specifically evaluate ICT-supported home–school links, although associated educational ICT literature also identifies aspects of such relationships and their impacts. The research also covers a range of different technologies, age groups, aims and objectives, and varies in quality and range of assessment methods used. This makes it difficult to draw conclusions with confidence about the impacts that may arise. However, the various ICT-focused literature identifies benefits in terms of:

- ♦ literacy and reading
- ♦ better presentation, greater motivation and organisation of thoughts amongst low-achieving pupils
- ♦ increases in understanding of maths concepts and skills amongst ‘at risk’ pre-school and early years children
- ♦ work being extended through the provision of portables, further enhanced by instructing parents about how and the ways in which computers were going to be used
- ♦ improvements in the quality of homework amongst children with ‘academic problems’ through parental involvement
- ♦ gains in literacy and communication skills through extensive use of ICT/portable devices: greater self-esteem and increased opportunities to extend work and the sharing of knowledge between pupils and teachers
- ♦ sharing of knowledge and skills between friends and family, and utilisation of portables as a tool for inclusion
- ♦ more challenging work being undertaken as a result
- ♦ increased time on task through use of a telecommunications network to conduct homework, and closer teacher tracking of pupil performance
- ♦ improvements in parental ICT skills and knowledge of their children’s use of ICT and schoolwork more generally.

However, there are a number of factors that underpin the success of initiatives. Home–school links, as with technologies, do not work in isolation from the wider social context or other mechanisms that underpin effective practices for delivering the overarching objectives.

It is notable that none of the projects worked in isolation from other methods of delivering learning objectives, which are vitally important to the success of such links. Advantages may be as much a reflection of parental engagement and accentuation of particular aspects of their children’s learning and school life as they are the result of inherent capacities encapsulated within the technology. Similarly, the closer involvement and understanding of families by schools and teachers may be another critical variable, and, whilst the technology may facilitate such understanding, it is individual practice which remains most important.

Identified within the literature are a range of factors contributing to the successful implementation of ICT-supported home–school links. Some of the main factors supporting the development of effective initiatives include:

- ◆ clarification and agreement surrounding the aims and goals of home–school links
- ◆ collaboration and sharing experience
- ◆ avoiding prescriptive approaches
- ◆ developing greater understanding of needs, wants and cultural backgrounds, and establishing effective and inclusive mechanisms for communication
- ◆ the collection and use of reliable empirical information regarding the prior experience of pupils, teachers and parents with computer technologies
- ◆ the provision of appealing content reflecting competency, increasing parental confidence and belief that their impact can be significant
- ◆ the use of appropriate technologies to facilitate links and achieve objectives
- ◆ sufficient technical and support resources
- ◆ parental involvement with the technology and engagement with children’s learning objectives
- ◆ clear and effective pedagogical and instructional strategies
- ◆ where appropriate the emphasis of ‘key learning concepts’ and how ICT can support the curriculum
- ◆ parent and teacher training in both ICT and home–school link development
- ◆ improving understanding of pupils’ uses by teachers and parents
- ◆ clarity over roles and responsibilities
- ◆ creating a ‘homelink teacher’ post and a number of diverse strategies to encourage parental participation
- ◆ developing partnerships with the wider community and local organisations and businesses
- ◆ holistic and sensitive approaches that consider a number of problems and difficulties that already exist in the wider community
- ◆ regular re-evaluation of initiatives, their aims and means for inclusion
- ◆ identifying and using role models and champions from amongst those groups least likely to participate, as well as ‘innovators’ within the school and wider community to support the initiative.

Initiatives do not have to be ‘high tech’ to be successful. Links are more likely to be effective when they are established around clear and agreed aims and objectives and have the collective support of those involved. They may also be successful when they focus on either formal or informal learning objectives rather than solely on the development of ICT skills. Building upon existing effective social organisations, contexts and partnerships is also likely to be advantageous.

Children’s use of ICT in the home is very different from that undertaken in school. A large percentage of pupils wish to use ICT for schoolwork and



homework and tend to prefer using it in this location. This may be an important issue to consider and incorporate when developing initiatives.

However, home–school links vary considerably and do not always bring about benefits. A range of factors and problems can impact upon their effectiveness and these need consideration when developing initiatives. A number of these are presented below:

- ◆ The demands of the curriculum and other activities can limit the activities that children can participate in.
- ◆ Pupils and parents may be unwilling or lack incentive to become involved.
- ◆ Parents may lack the confidence, perceived ability, time and resources to take part.
- ◆ Parents are a heterogeneous group but may be treated as one homogeneous group by schools and LEAs and, as a result, all needs are not accounted for.
- ◆ Claims made about the benefits of home–school links may cause anxiety for schools.
- ◆ Staff may feel there are already too many demands on their time due to curriculum demands.
- ◆ There is often insufficient training preparing teachers for initiatives.
- ◆ Initiatives may incur financial costs, and money may not always be available.
- ◆ Safety and security issues are presented that need tackling.
- ◆ There is a relative lack of research findings relating to costs and effectiveness and good practice. Without such data, schools may be more reticent to develop links.

There are a range of other barriers to the development of ICT-supported links. In particular, a number of issues relating to the digital divide and other inequalities also have implications. These relate not only to parental and pupil access to technologies at home, but also to variations in literacy levels, interest and educational levels. Those who are disaffected may be more reticent to be involved in such activities. Research also suggests that teachers' awareness of the Digital Divide (\*See Becta 2001b) reduces the use of ICT for school purposes.

The failure adequately to address these issues may mean that development of ICT-supported initiatives further disadvantages those on the wrong side of the divide.

The development of home–school links can also have impacts on the structure and purpose of the school and may incorporate the following:

- ◆ Extending the services schools offer to pupils, parents and the wider community.
- ◆ Increased contact with other social support and voluntary agencies.
- ◆ A move toward a holistic approach to schooling.

- ◆ Changes in the the way schools perform internally and externally.

The various aims, objectives and contexts are likely to produce different benefits and problems. Criteria for defining a home–school link are unclear, and their complexity makes it hard to assess impacts. A typology of links is beginning to emerge, however.

From a review of the wider literature, Ball (1998) identified seven different types of home–school links with differing objectives. These are:

- ◆ decision making and management of the school
- ◆ communication between home and school
- ◆ school support for families
- ◆ family and community help for schools
- ◆ school support for learning at home
- ◆ collaborations with community agencies
- ◆ community education.

Future research might also identify and examine the ‘theoretical’ and pedagogical approaches underpinning aims and objectives.

A range of technologies can play a role in facilitating and enhancing such links and add a new dimension in terms of teaching and learning. More and more schools are using these technologies in exciting and innovative ways, and home ownership is increasing, which suggests that developing links utilising these technological tools is becoming more viable.

A number of newer technological developments and initiatives also increase the possibility of ICT-supported home–school links becoming more viable in the future. These include:

- ◆ broadband services offering faster internet access, ‘always-on’ connection and ‘value added’ services
- ◆ portable ICT devices that offer a further mechanism through which to facilitate links and give access to those who currently do not own
- ◆ the increasing number of schools are producing ICT development plans that aim to make use of their ICT facilities outside school hours
- ◆ government plans to provide ‘universal’ internet access by 2005
- ◆ the growth of ‘e-learning’, including on-line educational resources, CD-ROMs and educational digital learning channels, offer access to a wider range of home-learning materials.

In light of technological developments, it is been possible to identify eight categories in a technology model that can support home–school links. These are:

- ◆ electronic communication
- ◆ ‘basic’ school web site
- ◆ resource-rich / interactive school web site
- ◆ on-line learning / ‘virtual school’

- ◆ community use of school-based ICT resources
- ◆ ICT loan/subsidy schemes
- ◆ local TV – locally produced educational resources
- ◆ community intranet – widening access to on-line resources using digital TV.

There are a growing number of examples of these being incorporated into home-school initiatives. However, there is a need for much more research to be undertaken in the area to provide examples of good practice so that schools can make informed decisions about the development of initiatives

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## SECTION 3

### INTRODUCTION AND BACKGROUND

#### 3.1 ICT and home–school links: possibilities for the future

Home–school links, in their broadest sense, have always been an important facet of school life, but the facilities and functionality afforded by ICT offer the potential of a new dimension to this relationship. The various ways in which the use of ICT might support and enhance the relationship between the home and school is only just beginning to emerge. Such benefits might relate not only to teaching and learning but also to the way schools are managed and administered. For overlapping reasons, ICT-supported home–school links may also relate to a number of issues on the Government’s agenda, including raising attainment, ICT and inclusion (the ‘Digital Divide’), and the promotion of homework and other out-of-hours activities.

However, alongside the opportunities also lie challenges. The use of ICT in home–school links is becoming an important area for consideration by schools and local authorities. This is in part because of the increasingly high proportion of students who now have access to computers and the Internet at home, in addition to the other forms of ICT with which they have become familiar. Educational institutions operate in a social context regarding the use of technologies by their learners, and they will need to make decisions regarding whether or not, or to what extent, such technologies are to be incorporated into their teaching and learning practices. This will also require consideration of skills, resources, infrastructure and availability of home technologies. In order to make these decisions, they need to be able to draw upon examples of use, models of effective practice and any available research evidence regarding the effects on learning in particular.

#### 3.2 Historical context: the increasing importance of home–school links

In recent years there has been a significant incorporation of various aspects of parental involvement in education policies. Since the 1980s there has been a notable accentuation of parents as educational consumers, with legislation aimed at increasing parental choice and widening rights to greater information about schools and their practices (Hughes 1996). Simultaneously, there has been increased governmental preoccupation with education and particularly with the ‘measurement’ of academic outcomes, which has further accentuated communication mechanisms between parents and schools.

Parental involvement in numeracy and literacy standards, the introduction of homework guidelines, and the development of home–school contracts, for example, have all helped to further institutionalise the link between the home and school, and, in so doing, have set out more clearly the expectations and responsibilities of both. Links between schools, parents and the wider local

community is one area that Ofsted has reported on for some time, and such links are likely to continue as a focus of significant attention and perhaps increasingly so because of the proliferation of ICT. For example, schools' ICT facilities will have to be made available for out-of-hours use by pupils and the local community to be eligible for NGfL funding in 2001/2 (DfES 2001). Greater communication channels are also afforded because of the functionality of new technologies. Education authorities have also become increasingly responsible for ensuring that effective approaches are devised that address the needs of local people. This has led to greater ties between schools, families and communities, and has helped to increase the emphasis on such relationships, in some cases leading to the stimulation of academic success amongst some children (Dyson & Robson 1999). Greater parental involvement in children's education is being used as one mechanism for raising standards in education (Smith 2000), with the intention that the increased participation and mechanisms for communication will also help to reduce social exclusion. The recent DfEE (2000) publication, 'Schools Plus Policy' reviews research relating to activities such as study support and family and community involvement in education.

Against a backdrop of concerns about standards, parental involvement is identified as one of the key variables in 'school effectiveness', increasing the 'pressure' upon schools to promote co-operation and participation. The school effectiveness literature has also identified the role ICT can play in raising standards. For example, in reviewing the UK and US literature, Weindling (1999) identifies aspects such as 'greater parental involvement', 'increased learning time out of school', 'additional support by parents', as well as 'information technology', as key factors in a typology of strategies aimed at raising achievement. This suggests that ICT-supported home–school links initiatives may contain many of the necessary components for raising achievement.

The perceived importance of home–school links also arises from the increasing emphasis that has been placed on the child as 'active learner' at the centre of teaching and research (cf James & Prout 1990; Jenks 1996). Furthermore, there has been greater interest in perspectives within the educational psychology literature that view children as actively constructing socially and culturally situated knowledge during interaction processes. The increased recognition of embedded, often informal and implicit learning that is drawn from the home or community backgrounds and experiences of school pupils has further heightened the need to develop greater and more culturally sensitive home–school links. One key concept from this perspective is that children's meanings are constructed through interaction with more experienced others in 'communities of practice', and outlooks and dispositions toward learning are largely determined by these communities (Lave & Wenger 1991, Anning & Ring 1999). Therefore, the need to connect the home and school, and to mobilise such communities of practice has become increasingly perceived as an important aspect in children's learning.

## SECTION 4

### CHALLENGES IN CONCEPTUALISING HOME–SCHOOL LINKS

#### 4.1 Types of home–school links and gaps in model development

In reviewing the literature, it was found that there was no conceptual model around which to specifically categorise ICT-supported home–school links. However, such a model does exist in the broader home–school links literature. Findings suggest that the intensification of relationships between the home and school can reap various rewards (Ball 1998). However the relationships and outcomes, whilst often strong, are complex and far from clear or consistent in terms of how they impact on young people’s educational attainment (Caddell 1996). Similarly, Dyson & Robson (1999) suggest that, previously, there has been little clear indication about the effects and effectiveness of the various types of school–home–community links despite increased interest at policy level. From a review of the wider literature, Ball (1998) identifies seven different types of home–school–community links and the reasons underpinning their development. Such a typology provides a fruitful starting point for categorisation that also enables easier comparison and contrasting of initiatives, and a basis on which to judge the aims and type and extent of outcomes that each one facilitates. These seven types are:

1. Decision making and management of the school  
Parents and community representatives participate in school governing bodies, parent/teacher associations and advisory committees.
2. Communication between home and school  
There is a continual exchange of information between families and schools over individual children, through letters, reports, telephone calls and meetings. This could also involve other electronic methods.
3. School support for families  
Schools may provide help for families on matters such as health, development and creating home conditions that support school achievement and social behaviour.
4. Family and community help for schools  
Parents, community and employee volunteers may assist children, teachers or school management in the classroom or in other aspects of school activities.
5. School support for learning at home  
Schools may help families to develop learning at home, which in turn may help the child’s learning at school.
6. Collaborations with community agencies  
Outside agencies, both local and national, provide the school with access to community and support services for children and families.

## 7. Community education

Learning opportunities may be available for all age groups both within and outside the school and within and outside the conventional school hours.

The above typology however, tends to oversimplify the range of possible home–school links, with many spanning more than one category or not readily fitting into either. This is especially true when considering the various ways in which ICT can be utilised. Whilst none of the above categories relates solely or specifically to ICT, it is possible to see how new technologies might improve or facilitate the transfer of information between the home and school in each of the categories. However, future work would also benefit from the development of categorisations, which also identify the ‘theoretical’ approaches underpinning the aims and objectives of links, the pedagogical approaches used, and technologies utilised. (See for example, Shartrand *et al* 1997)

## 4.2 Problems with terminology and implications for developing home–school links

Generally, the criteria for defining something as a ‘home–school link’ are vague. For example, at what point is contact between schools and parents defined as a specific home–school link *initiative* rather than just a part of general communication and contact? Such criteria need to be made more explicit if clear evaluation of outcomes and effects is to be achieved. The criteria for marking this division may become more pertinent as ICT becomes a more common mechanism through which knowledge, communications and information are exchanged.

When considering many of the issues relating to home–school links, it is worth remembering that many closely related terms are often presented unproblematically, yet these require much more careful distinction. Caddell (1996) suggests that the terms used when considering and developing school–home relationships and initiatives can in themselves raise issues and uncover previously unrecognised problems. For example, she identifies that within the literature ‘parental involvement’ is used as an ‘umbrella term’, encompassing all home–school contact, yet it is also interpreted in various ways according to different philosophical and ideological perspectives. Similarly, the term ‘parent(s)’ can mask the diversity of parenting cultures that exist. How might the term ‘parent’ be defined, and who might be included or excluded as a result is rarely thoroughly examined. Moreover, can it always be necessarily assumed that parental involvement is always a beneficial factor? Parental involvement may require careful consideration by decision makers about the roles, responsibilities, aims and acceptable practices that need to be established by all parties involved.

The term ‘home’ is also a nebulous and loosely specified term that requires specific consideration, particularly when thinking about ICT-supported home–school links. For instance, disparities in ownership and access levels may force

some people to utilise places other than the 'home' for access or else face becoming excluded from participation and potential benefits. Moreover, for some, home is not one single, easily identifiable place, and this brings into play a whole set of other complex issues surrounding safety and responsibilities that may require the co-operation of a number of other parties. The need to account for these differences has a number of repercussions for the development of ICT-supported home–school links, underlining the complexity of the term and going some way to highlighting the multiple factors and agents that may be involved.

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## SECTION 5

### OVERVIEW OF RESEARCH FINDINGS ON HOME–SCHOOL LINKS: NON ICT LITERATURE

A number of benefits, problems and recommendations relating to home–school links has been identified in the wider literature, and a summary of these is presented below. These are included in the report because the majority of findings are fundamental and generic issues that are also likely to have direct relevance for initiatives that incorporate computer technologies. This enables readers to decide for themselves how ICT might be incorporated to help develop effective home–school initiatives, extend existing possibilities, or even when it may present additional difficulties. Findings are drawn from a wide range of sources but, in particular, Ball’s (1998) findings regarding the types of relationships between schools, families and the community, Dyson & Robson’s (1999) research evaluating the effects and effectiveness of the different types of links; and the DfEE (2000) ‘Schools Plus Policy’ report.

#### 5.1 Main issues and benefits

##### 5.1.1 Impact on pupils and parents

Home–school links have been found to support the learning process in a number of ways, and can promote self-esteem and confidence amongst the young people involved (Ball 1998). They have also been found to be beneficial in terms of improving academic standards and reducing social exclusion. There is also significant evidence to suggest that the majority of parents wish to be involved in supporting their children’s learning (Dyson & Robson 1999).

Homework, perhaps the most common and taken-for-granted home–school link, itself has been shown to have a significant impact on pupils’ attainment. Forgatch & Ramsey (1994) reviewed research literature that has identified homework as being an important component in academic achievement. It was shown that greater time spent on homework had a positive effect on grades, and that supportive parental involvement had beneficial effects on children’s homework efforts and effectiveness. The authors argue that, taken together, research demonstrating the positive effects of homework *and* parental involvement provides a powerful argument for the social validity behind the design of interventions that combine the collective efforts of teachers and parents to lead to positive pupil outcomes.

Study findings (DfEE 2000) suggest that in order to raise attainment using ‘Schools Plus’ activities, developments should occur in two main areas. These are extending the services schools offer to their pupils, and developing greater involvement of the community in the school and, conversely, the school in the community (DfEE 2000). In developing such aspects, better lines of communication are established, and this has a beneficial impact on the level and quality of parent involvement (Hoover–Dempsey *et al* 1992). This, in

turn, as noted above, can lead to improved standards of attainment. Consultation with parents in management and decision-making aspects of the school have also been shown to have beneficial effects, as they create feelings of empowerment through demonstrating an appreciation of parents' role as that of educational 'consumer'.

### 5.1.2 Impact on teachers and schools

Home–school initiatives can change the way schools perform both internally and externally (Jehl & Kirst 1992). However, this is likely to vary depending upon the type of initiative in place, the support offered to and by parents and other agencies, as well as the aims and goals underpinning the schemes. These can range from specifically focusing on the education of pupils to wider issues surrounding development of individuals and establishing links with wider communities.

Generally, parental involvement tends to be high at the pre-school and primary level but diminishes as pupils progress through their school life (Ball 1998). Children's entry into school at earlier ages and the growing relationship between primary schools and pre-school provision are bringing schools into closer contact with social support agencies and voluntary agencies that work with families. Many targeted support programmes draw on expertise from a wide range of individuals and agencies and, increasingly, specialist staff are being employed to co-ordinate support services (Ball 1998). These other forms of partnerships with schools tend to be welcomed by parents, and it has been recognised that non-education professionals also make important contributions in working with vulnerable children in non-academic areas of the curriculum (Dyson & Robson 1999).

Where positive impacts upon children's progress have been identified, schools are often taking an interest in areas of family need previously thought to be the responsibility of other agencies (Ball 1998). There has been some movement toward a 'full service school' and 'holistic' approaches toward the school being a base for all the family and the wider community. Ball (1998) argues that in some cases, particularly within disadvantaged communities, a logical extension might well be a restructuring of schools to facilitate such approaches.

## 5.2 Disadvantages, barriers and issues

Despite evidence that identifies parental involvement via home–school links as having positive outcomes, there are a number of issues and difficulties identified in the literature that need to be overcome in order to increase the likelihood of success.

### 5.2.1 Impact on pupils and parents

The existing demands of the curriculum may limit the number of activities in which young people can, or want to, be involved with. This may be further reduced when aspects relating to safety and security are taken into account

(Ball 1998). In some cases, pupils may be unwilling or feel little incentive to engage with home–school activities. This may also be true of some parents, who see it solely as the schools responsibility to deliver their children's education. On the other hand, many parents may feel they are excluded from participation in school-related activities. This can occur for a number of reasons, including language and cultural barriers, the mechanisms used for obtaining parental participation, feelings of inadequacy or alienation, lack of confidence, and the existing demands and restrictions already placed on their time and resources.

Vincent & Tomlinson (1997) argue that discourse surrounding home–school links often presents a 'deficit model' of working class parents and, as such, represents 'hegemonic interpretations' of 'good' parenting practices. They claim that parents are often treated within the literature, as in practice, as one homogeneous group with analogous requirements, apart from the token deficit view relating to social class. It is argued that more research and attention needs to be given to how different groups of parents relate to the education system in relation to their own prior experiences of school, both as pupils and as parents. Moreover, there remains precious little research into differential 'parental agency', yet this raises questions about parental power that undermines the whole notion of 'increased parental choice' which itself has underpinned so much of the literature, particularly over the past two decades. Undefined but widely used terms such 'participation' embody power differentials in that many parents are co-opted into resolving various problems faced by the school without having any input regarding either the definition or diagnosis. Ultimately, the authors warn that, whilst much discourse and language may appear to promote participation, the propensity or possibilities of different groups to become involved with such mechanisms and the disparate influence they have in defining agendas for action is often overlooked.

Whilst home–school links have been identified as generally beneficial, school practices and the type of home–school links can negatively affect the extent to which some parents can, are encouraged, or are willing to participate. This is more likely to occur where initiatives are developed prescriptively and without adequate consultation with the target population. Such factors raise issues relating to power and the ownership of social and cultural capitals. Some parents are more effective in mobilising themselves and having their voices heard in decision-making and management aspects, and this can lead to certain individual or group interests prevailing and dominating over those of others (Dyson & Robson 1999). Research has demonstrated that parents from the most advantaged backgrounds tend to be most successful in exerting their influence over the decision-making processes due to their greater and prior knowledge of the educational system (*cf* Gewirtz *et al* 1995).

### 5.2.2 Impacts on teachers and schools

Support for children tends to be directed through the family in earlier stages of schooling. However, perceptions of children and their needs change as

they progress through school. As they get older, young people tend to become viewed more individualistically and 'hands on' parental involvement often declines (Dyson & Robson 1999, Ball 1998). The main concerns tend to centre much more on children's 'need' for information. Communication between home and school, particularly at secondary level, has been more likely to focus upon issues relating to examinations and academic attainment. There is also the possibility that tension may arise between the aims of home–school links focusing on raising standards and those that support broader aspects relating to the wider community. Whilst these are not necessarily mutually exclusive, it is often perceived that pursuit of both these goals may require quite distinct approaches that are likely to require different approaches and result in discrete outcomes.

To varying degrees, there are also financial costs connected with the development of home–school links. Money may not always be available for the development of the type of home–school link desired, and the financial position of the school may be a determining factor. Moves toward the more 'holistic' school approach, which have been identified as effective, can require significant financial input that may not always be readily available (Dyson & Robson 1999). This may have greater consequences in areas where there is a need for safety, security or other services to support the development of initiatives. Furthermore, safety and security issues can deter the development of initiatives by schools and LEAs which may be less than willing to deal with 'outsiders' (Ball 1998). When extreme caution is exercised by schools, it can deter outside parties from becoming involved and, as a result, detract from the collaboration necessary to achieve the greatest impacts. Many home–school links require collaboration with other agencies. However, this is not always welcomed and can be problematic, particularly if animosities already exist (Ball 1998). Many of these partnerships may place additional burdens on the schools themselves, and they can become dominated by 'outside' professionals (Dyson & Robson 1999).

The claims made about the benefits of home–school links can cause anxiety for schools concerned about fulfilling associated 'practical expectations' and improvements (Ball 1998). This may be compounded further due to the anxieties staff may have about the difficulties in creating effective partnerships with parents. It has been identified that in some cases teachers feel that there are already too many demands made on their time due to curriculum requirements. As a result, they may show reluctance to become involved in the development of home–school initiatives, as they often require substantial investments of time and effort (Ball 1998, Dyson & Robson 1999). Insufficient training in preparing teachers for community approaches to education have also been noted, and this may create a practical barrier to the development of successful home–school initiatives (Ball 1998).

### 5.3 Recommendations, suggestions and considerations for creating effective home–school links

A number of generic considerations, suggestions and recommendations aimed to reduce and overcome the barriers and difficulties identified above have also been outlined in the literature. These are summarised and presented below and may be applicable to the development of all home–school initiatives, including those utilising new technologies.

- ♦ Clear and effective mechanisms for communication need to be identified and established between all parties involved, with the aim of creating a concept of shared responsibility for children’s learning. These may include negotiating and developing a clear understanding of what parental involvement encompasses, who is involved, and what the motivations behind it are (Caddell 1996).
- ♦ Initiatives should account for the views of *all* parents, and might consider building links around existing family practices and routines, which may vary significantly. Parental involvement is more likely where schools offer an inviting environment and develop an ethos that supports this. Mechanisms ensuring that cultural and social differences are incorporated and accounted for need to be developed so as to inform initiatives. A wider, holistic approach that accounts for the needs of individual families and considers broader cultural aspects has been identified as bringing greater benefits, particularly in deprived areas (Ball 1998).
- ♦ The creation of a ‘homelink teacher’ post with specific responsibility for developing and co-ordinating home–school links based on knowledge gathered from all parents may be a valuable exercise, at least in the early stages of implementation (Caddell 1996). Home visits by teachers or other representatives of the school may also be beneficial in building relationships and enabling parents to feel more relaxed.
- ♦ In deprived areas the likelihood of greater benefits is increased when approaches are tailored specifically to the local community and involve powerful partnerships supported by other agencies (DfEE 2000, Caddell 1996). However, improvements are not automatic and may require a holistic and sensitive approach that considers a number of problems and difficulties that already exist in the wider community (DfEE 2000).
- ♦ Initiatives, their aims and means for inclusion need to be constantly re-evaluated in light of the evolution of the groups involved. The process of re-evaluation also increases the likelihood that new difficulties and constraints may be overcome before they become barriers (Caddell 1996).
- ♦ ‘Prescriptive’ approaches may alienate the most marginalised groups, and the use of ‘stereotypical’ mechanisms for participation may make involvement unappealing to some. Poor participation in existing initiatives may be indicative of discomfort or lack of confidence with

existing mechanisms. There may be a need to examine the assumptions behind the development of 'appropriate opportunities' and consider whether these are really applicable to the specific target population of parents (Caddell 1996). In using terms such as 'participation' and 'involvement', policy makers and those responsible for initiatives should not necessarily use existing assumptions. They should consult with their target groups to ascertain what the barriers and constraints of existing methods are.

- ◆ Using role models from amongst those groups least likely to participate has been identified as a method of encouraging the least represented to become involved (Caddell 1996). Similarly, the personalities and enthusiasm of particular individuals may influence the levels of participation amongst parents, pupils and the wider community. Such individuals need to be identified and supported.
- ◆ Children themselves are often positioned as passive recipients in significant areas of their lives, including policies and initiatives that aim to develop home–school relationships. The most effective home–school links are likely to empower young people by involving them in a process of consultation and initiative development to increase feelings of ownership and responsibility (Smith 2000, Caddell 1996).
- ◆ The positive impacts that parental involvement can have on children's learning and development need to be highlighted. Many may lack confidence and believe their impact is minimal compared to 'formal' education. Confidence levels need to be raised to those required for participation, and specific lines of communication need to be established to facilitate this. Engaging parents and pupils in careful consultation about how this might best be achieved may be a useful practice (Caddell 1996).
- ◆ Schools and policy makers may have to address the decline of direct parental involvement as children progress through school, and to develop initiatives that get both parents and their children working collaboratively toward agreed goals.
- ◆ There is a need to consider the timing and location of home–school initiatives in order to involve the maximum number of parents (Caddell 1996). This may become more pertinent in areas populated by black and ethnic minority communities, due to particular cultural norms and beliefs. Potentially, where access to ICT is broadly available, this could provide a mechanism to overcome many such difficulties, as 'digital events' can occur asynchronously and may also be undertaken in the home rather than necessarily requiring a specific 'meeting' point.
- ◆ Home–school initiatives, particularly in disadvantaged communities, might explore and exploit the wide diversity of knowledge and skills, the various 'funds of knowledge' (Moll *et al* 1992) that already exist in different social and cultural backgrounds. This would mean greater bi-directional home–school knowledge exchanges that increase the range of mechanisms for participation. The focus in this case is as much about

parents and the community as it is about the school and/or technology. Mobilising such ‘funds of knowledge’ requires attention and examination of parental cultures and backgrounds, as well as the particular skills and competencies that exist within it. Such factors are likely to have significant implications for decision makers who may have to consider how best to mobilise ‘networks of knowledge’ (Moll *et al* 1992), or social capitals (Coleman 1988) that already exist.

Archived

## SECTION SIX

### HOME–SCHOOL LINK TECHNOLOGIES

Having overviewed the broader home–school literature, this section identifies the specific types, and prevalence of technologies that may be incorporated to help facilitate links between home and school. Whilst the previous section identified evidence to show that home–school links are advantageous, the question remains as to whether, and to what extent, the utilisation of ICT can enhance such initiatives, under what circumstances, and using which technologies. The capacity and functionality of ICT potentially adds a new dimension to home–school relationships. However, precisely what form this will take is only just beginning to emerge.

This section of the report provides brief descriptions and data regarding the key technologies being used to facilitate links between home and school. The following section provides examples of the use of these technologies and the type of content made accessible via them, and also attempts to offer a guide to the varying models of ICT-facilitated home–school links. However, it should be noted that this information represents a ‘snapshot’ of the present situation and is likely to change over time, particularly as a result of technological developments.

#### 6.1 Internet access and on-line presence

The Internet, in theory, allows ‘unmediated access’ to learning resources. It is also likely to be the key telecommunications channel by which schools will be able to link with homes and other sites, so facilitating home–school links. Data regarding the levels of internet access from the home, and the number of schools with an on-line presence is included below.

##### 6.1.1 Home internet access

Around 45% of households claim to have a PC (OfTel 2001). 30% of UK households claim to have access to the Internet at home (OfTel 2001), an increase of 2% from the previous quarter. The same survey found an average of just over two users for each of these households, meaning that on a conservative estimation there are at least 16 million people using the Internet at home (around 25% of the population). These figures are similar to a recent official statistical release, that suggests that almost one-third (32%) of UK households could access the Internet from home, or 7.8 million households (National Statistics 2000b). This data includes access from all technologies, including digital television.

An interesting detail in this data is that the households with much the highest levels of home internet access are two-adult households with children: 31% if there is one child, and 34% if there are two or more children. This is higher than levels of home internet access amongst couples without children and those below retirement age. This may suggest an incentive felt in those



households with children to acquire home internet access, which could be related to the perceived education and skills needs of the children (all data from National Statistics 2000a).

Further, this sense may be bolstered by the responses of school-age children themselves. According to an on-going school-based survey, in England 65% of secondary and 55% of primary school pupils claim to have access to the Internet at home, while 85% of secondary and 78% of primary school pupils claim to have access to a computer at home (National Statistics/Nottingham Trent University 2001).

Another survey (BESA 2000) suggests that an estimated 48% of all teachers have internet access at home (53% of all primary teachers, 42% of all secondary teachers, and 60% of all teachers in special schools). However, these figures do not include details about the type of computer and how easily, and for what periods and purposes the Internet is accessed. Access speeds in particular could be an important factor in use, especially regarding the time it takes to download complex digital content. Further, it is important to remember that access to ICT cannot be equated with actual use (Selwyn & Bullon 2000), and that more data is required to try to begin to understand patterns of use.

Detailed data on what school-age children use home internet access for is somewhat limited (there are methodological difficulties in tracking internet use in terms of classifying on-line activities, especially given the off-task temptations inherent in the medium). According to one commercial research survey (Continental Research 2000), 'searching for homework information' is the most popular reason for children accessing the Internet (over half of respondents), with both 'accessing homework help services' and 'contacting teacher/homework help services' also registering (around 10% and 5% of respondents, respectively).

Further, according to the July 2000 Omnibus survey by the Office for National Statistics (as reported in National Statistics 2001), 8% of all respondents aged 16 and over cited 'educational' as a 'main reason for using the Internet'. Although, as might be expected, a significant minority of those citing an educational purpose were aged 16–24 (19% of this age group), it was also cited by 25- to 34-year-olds (6%), 35- to 44-year-olds (7%), 45- to 54-year-olds (5%), and 55-year-olds and over (3%). Interestingly, these figures are, across each age group, higher than those recorded for the response 'buying goods and services'. Use of e-mail was the most popular response across all age groups.

However, the above results must take into consideration the relatively limited amount of all ICT use that internet usage constitutes, and also against the overall proportional use of ICT for educational purposes.

#### 6.1.2 School internet access

According to the annual DfES survey of ICT in schools in England, 86% of primary and 98% of secondary schools were linked to the Internet in some

form (DfEE 2000). The same survey found that 37% of primary teachers and 52% of secondary teachers have a personal e-mail address, thereby in theory facilitating electronic communication, for example between parents and teachers.

At a school level, external electronic communication via e-mail was found to be increasing: 53% of primary schools used e-mail in teaching and learning, while 66% used it for administration; 69% of secondary schools used e-mail in teaching and learning, while 79% used it for administration.

### 6.1.3 School web sites

It was found that 62% of secondary schools and 34% of primary schools have their own web sites – an estimated 2,200 secondary schools and 6,200 primary schools (DfEE 2000). According to an alternative survey (BESA 2000), it is estimated that of the almost 90% of state schools that are connected to the Internet, 42% have a web site (35% of all primaries, 75% of all secondaries, and 47% of all special schools).

### 6.1.4 Broadband technology

Any discussion of the Internet, and especially its future development, must include a note about broadband technology (actually a generic term covering a range of technologies, the differences between which are not relevant here), whose introduction may be crucial to the greater usage of internet-based services.

The majority of users connect to the Internet over a telephone line, typically using a modem with a speed of 28.8 or 56 kilobits per second. This 'narrowband' access requires users to wait while a dial-up connection is made before they can access the Internet, and means that internet usage once connected can be slow. Broadband services offer significantly faster data rates (that is, the rate of the transfer of data), so enabling high-speed internet access and the delivery of services such as video-on-demand. Higher bandwidth can also facilitate 'always on' connection to the Internet.

The two factors of higher speed and always-on access can significantly enhance the user's experience of the Internet. The additional capability of higher bandwidth services also provides scope for new, value-added services that are not feasible over narrowband. These could serve both consumers (such as video streaming, video conferencing and education), and businesses (such as electronic trading communities and application service provision), hence the potential importance of broadband technologies to the future development of the Internet and internet-based services.

As a result, UK Government has argued that a 'broadband economy' is likely to be one with a higher degree of connectivity, higher levels of e-commerce activity, and a wider range of value-added activity taking place across the Internet (see E-Envoy 2000b). However, at present, there are controversies regarding the rate at which these broadband access technologies are being made generally available, particularly centring on the ability of competing

companies to install connections to subscribers' homes from local British Telecom exchanges.

## 6.2 Additional school-based ICT provision

### 6.2.1 School ICT facilities

Portable ICT offers the potential for the loan of equipment to pupils for use outside the school. Data is available regarding the amount of portable ICT in schools.

There are an average of 1.7 'laptops' or palmtops per primary school (compared to 0.7 in 1998), 6.1 per secondary school (compared to 4.9 in 1998), and 2.2 per special school (compared to 2.1 in 1998). Hence, the numbers of portable devices are increasing but, unsurprisingly, these numbers are dwarfed by those for desktop PCs: 16.2, 106.5, and 19.1 in primary, secondary and special schools, respectively, in 2000 (all data applies only to England and is taken from DfEE 2000).

It has been found that 25% of portable computers in primary schools are over three years old, while the equivalent figure for secondary schools is nearly 30%. However, both of these figures represent a significant drop from the figures from the 1998 survey, suggesting a degree of investment in new machines. The percentage of 'old' portable machines in special schools reduced only marginally (from 43 % to 39%). However, the general picture of new investment is further supported by the increasing percentage of these machines that now have multimedia capability: 44% in primary schools, 55% in secondary schools, and 51% in special schools.

However, there is no data available regarding whether any of this equipment is available for the pupils to take home or is used in any other capacity outside the school premises. Nonetheless, there are a number of laptop leasing / purchasing schemes in existence which have increased the potential of home ICT use for both educational and wider use. These include schemes such as the Microsoft-supported 'e-Learning Foundation' and Government-established 'National e-Learning Foundation'.

### 6.2.2 Use of school ICT outside school hours

The DfES survey also points to the fact that, according to their ICT development plans, 61% of secondary schools, 36% of primary schools and 27% of special schools are planning to make use of their ICT facilities outside school hours, including for 'community purposes' (DfEE 2000).

### 6.2.3 Alternative internet access technologies

UK Government also appears to have recognised that internet access via a home PC is unlikely to be a practical, affordable or desirable model to achieve its publicly stated universal internet access target of 2005 (E-Envoy 2000a). As the recent Communications White Paper suggested:

“Such access will be either through devices at home, work or on the move or through access in a nearby community centre... Consumers can now gain access to the Internet using their (analogue or digital) television by purchasing a set-top box that is Internet enabled. They can also use an Internet-enabled games console. For consumers on the move, WAP (Wireless Application Protocol) services are available now, allowing access to many Internet sites. Personal Digital Assistants are beginning to offer Internet access. And 3G mobile phones will provide high-speed access. Indeed, it is estimated that by 2003 there will be more mobile than PC connections to the Internet. These different kinds of access to the Internet will become increasingly important in achieving universal Internet access.”

(3.8.1, DTI/DCMS 2000)

Computers (both PCs and notebooks) are the most familiar hardware platforms for accessing the Internet. However, there are alternative platforms available, including digital television (in a number of variants), internet-enabled televisions and telephones, handheld and palmtop computers, and video games consoles. These are outlined below, including relevant data relating to usage where it is available.

#### *Digital television*

“Digital broadcasting technologies have the potential to offer new ways of providing learning experiences to the home as well as the office. More digital channels can be broadcast than was possible with analogue channels. Potentially the programmes could be cheaper to produce and broadcast. Interactive services of various types are possible. Interactivity is seen to be of particular importance in the process of learning. The combination of these two factors means that learning through a TV set could be made more accessible and interesting and has the potential to reach most households in Europe who are already used to watching a TV.”

(p 3, chapter 1, European Commission/Ecotec 1999)

Digital television can be delivered through satellite, cable and terrestrial means. Satellite signal reception requires a satellite dish, cable reception requires connection to a cable network (if available in a particular locale), while terrestrial reception makes use of the existing television aerial. For all these delivery mechanisms, a digital set-top box has to be connected between a regular television and the incoming signal. (There are some televisions that feature an integrated ‘set-top box’, but consumers may fear that purchasing these so-called integrated digital televisions may give them less flexibility than set-top box owners when it comes to upgrading or switching between service providers).

The set-top box converts the digital signal into a format that can be viewed on the television. It also usually provides the means by which only users who are registered can access specific digital services (for example, by being a subscriber to a particular channel), and contains the software to enable the use of interactive services by these users. (Digital broadcasting technology

also covers data broadcasting and digital radio, but digital TV will be the focus here.)

As with other forms of ICT, in the case of digital TV there is evidence that cost remains a barrier (OfTel 2000a). Nonetheless, digital TV does potentially offer access to on-line information resources for those who may have neither the resources nor the inclination to purchase a home computer but are likely to invest in the more familiar technology of a new television set or associated peripheral such as a set-top box (NOP 2000). One research company has suggested that by 2005 more Europeans will use 'interactive' (that is, by necessity, digital) television to access the Internet than will use home PCs (Forrester Research 2000b). It is currently unclear whether these predictions will be realised. It is argued that such an access mechanism offers hope in bridging the digital divide. However, there are qualitative aspects in relation to type and length of use and the type of access offered through such means that may mediate the potential for digital equality.

Uptake of digital TV has increased rapidly to around 5.25 million homes in the UK (or 21%), with acquisition expected to rise by around 13% in the next year (OfTel 2000a). Sky Digital reports that 4.67 million households subscribe to its services (via satellite receiving dishes), giving access to 13 million people (equivalent to 92% of its total subscriber base). Further, it forecasts that it will have 7 million subscribing households by 2003 (all data from DTG 2001). Sky Digital provides an e-mail, shopping, banking and information service called Open, which it claims has been used by two-thirds of all digital subscribers, and that through Open there are 1.3 million registered e-mail accounts (Open 2001). ONdigital reports that 1 million households subscribe to its services (via terrestrial aerials), and that over 100,000 people in 70,000 of these households are users of on-line services via its ONnet portal (ONdigital 2001). NTL reports that 531,000 households subscribe to digital services (via its cable network), but that this network now passes 8.8 million households and is 90% 'digital ready' (NTL 2001). Telewest reports that it has over 1.1 million multi-channel television subscribers and 215,000 'Active Digital' subscribers (the brand name for its digital television services) over its broadband fibre optic communication network, but that this network currently passes more than 4.9 million homes in London and the South East, Bristol and the South West, Birmingham and the West Midlands, Yorkshire, Merseyside, Tyneside and Scotland (Telewest 2001).

At present, the PC still remains the primary means of accessing the Internet at home. However, according to one survey, a quarter of current internet users expect to be accessing the Internet via digital TV within 'the next 12 months' – similar to the proportion who expect access through a mobile phone (that is to say, a WAP-enabled phone (NOP 2000), more information about which can be found below). Further, 14% suggest that they will be using a personal digital assistant (PDA), that is, a palm-sized computer, for internet access. Of course, these figures relate to consumers who are already familiar to some degree with the primary form of access technology.

Potentially more significant is the information that 10% of households with digital TV already claim to be accessing the Internet via their TV (OfTel 2001), a marked increase on previous quarterly surveys from the same source. One research survey suggests that the most significant 'driver' for households to use their digital TV for on-line access will be sending and receiving e-mail (Forrester Research 2000a). However, it has also been noted that, amongst those households who presently have digital TV but who have not yet used the available on-line services, 36% express an interest in using them in the future for 'educational purposes'. This is a higher proportion, in fact, than those who express an interest in e-mail, and only second to on-line shopping (OfTel 2000b).

Further, it is worth noting that millions of households are to some degree already familiar with one form of television-based access to information resources, through Teletext services such as the BBC's Ceefax. Teletext services are accessible via television sets equipped with special built-in decoders, able to interpret the signals that are broadcast alongside the traditional channel signal. More than 70% of households in the UK have at least one television able to receive Teletext broadcasts. According to one broadcaster, the Teletext service available on Channel 3 and Channel 4 terrestrial in the UK is used for an average of 15 minutes by 14.2 million people daily and by 22.2 million weekly (Teletext 2001).

#### *Internet-enabled television*

The Internet can also be accessed through a television set if it contains a modem and the necessary software. One of the most familiar models is the Bush Internet TV, which has an integrated 33.6 kbps (kilobits per second) modem. All commands are initiated through the special remote control, and users have to set-up an account with Bush's internet service. While this model offers web-based e-mail and comes with five e-mail accounts, it cannot support e-mail attachments (lacking the necessary office software as it is). Access is through a standard telephone line (with calls charged at the local rate) and, while there are compatibility problems with certain web sites running complex software, this model does enable the viewer to print web pages using a limited number of printer models.

Bush and other manufacturers also supply internet TV set-top boxes, which can connect with televisions which have a Scart socket (an adapter can be purchased if there is no Scart socket).

#### *Handheld and palmtop computers*

Some handheld or palmtop computers can, with the correct software and peripherals enabling a link to a modem, be used to access the Internet and for e-mail.

Handheld computers are generally small enough to fit into a jacket pocket, and in design terms often resemble reduced versions of notebooks with a clam-shell format. Most come with a stylus pen that is used to select on-screen options, but actual writing (such as word processing) is done using an

integrated mini-keyboard. The smaller keyboards may make touch-typing more difficult. Renewed interest in these devices has been generated by the improvements made in their operating software (including greater expandability and easier functionality), their affordability, colour screens, battery technology and power management. For some machines, 6-12 hours of constant usage are available between quick recharges, which compares favourably with average notebook's batteries (which last up to three hours), and is in line with the recharge frequency of mobile phones. The batteries in mono-colour screen palmtops will last much longer, with recharges necessary only about once a month.

A palmtop is a palm-sized computer that usually does not have a keyboard but is operated by using a stylus on a touch-sensitive screen. Its size enables it to be held in one hand while it is operated with the other hand. Given this reduced size, writing is done with the stylus, which is converted into text on screen by a handwriting recognition software program. Hence, palmtops are useful for storing information of a relatively limited nature (for example, via calendar and diary functions) but less good for entering a greater volume of information quickly or easily. In contrast to notebooks, palmtops are usually powered by off-the-shelf batteries such as AA cells. Typically, they do not have disk drives, but rather their programs are stored in ROM and loaded into RAM when they are switched on. More recent palmtop computers are equipped with PCMCIA slots to provide wider flexibility and greater capacity.

All handhelds and palmtops are designed to provide personal information manager (PIM) functions such as a calendar and address book, but handhelds are more likely to offer 'Office'-type software as well such as word-processor and spreadsheet programs. Generally, handhelds are usually used as computing companions to desktop PCs, while palmtops retain more of the traditional personal 'electronic organiser' function. However, this dividing line is increasingly being blurred because of the developments noted above.

Many of these devices are specifically designed to work with desktop PCs, with the desktop PC being the 'hub'. Most models have either a lead or a 'cradle' (a small stand into which the device fits that can plug into the desktop PC) to link the two machines. As long as the specifications of the desktop PC are high enough, data, whether PIM, documents or spreadsheets, can be copied between the machines.

Greater functionality is increasingly being added to these types of machines – for example, some include internet-capability. Flash card modems are available that enable users to connect to the Internet and browse web pages, for example using a version of Internet Explorer written for Windows CE. There are three main operating systems used in this type of device: Microsoft CE, Palm OS and EPOC. The latest version of Windows CE (3.0) is generally regarded to be a significant improvement over its previous versions, and is included on this type of device under the brand 'PocketPC'. Handhelds include models from Psion such as the Revo (costing around £300), Series 3, and Series 5 (costing around £400). However, these are rarely used in schools. Suitable modems retail for around £100.

### *Internet/e-mail telephones*

There are a number of ways of accessing the Internet and e-mail on new home and public telephone services.

The Amstrad Em@iler is a home telephone with an LCD screen and a small keyboard that can be used to compose and send e-mail, SMS (short text messages) and fax messages. The user has to register through the company's e-mail server. E-mail attachments can be opened as long as they are either pictures in JPEG, GIF or BMP format, or sound clips stored as WAV files, but not if they are in other familiar office software format.

For public internet access, British Telecom has installed its Multiphones in a number of places such as railway stations. It has a touch-screen display for internet access and e-mail as well as a normal telephone receiver.

### *Internet mobile telephones*

The mobile telephony market has been one of the fastest growing of all consumer markets over the last few years. The ubiquity of mobile phones, coupled with technological advances, has meant that they are increasingly being regarded as a potential platform for a fuller range of mobile information and communication applications. In the first instance, this means mobile internet access communications devices.

One technology that has received a large amount of attention is that of wireless application protocol (WAP). This allows specially designed mobile phones access to the Internet, although only a small proportion of web sites provide pages which are viewable on a WAP phone (that is, using the WML protocol). WAP phones carry a current price premium of between 5% and 25% over regular mobile phones. However, prices are falling, and major discounts are now available on handsets bought with contracts regarding use.

WAP technology has been much criticised because of slow connection times, the lack of current available content, the cost of per-minute connection charges, and the cumbersome experience of navigation around WAP sites. The slow connection times are a result of the rate at which data can currently be transmitted to and from mobile devices rather than an inherent restriction of WAP technology, but for understandable reasons users rarely make this kind of technologically informed distinction.

However, manufacturers emphasise that WAP is an evolving standard. Take-up of WAP phones has so far been below expectations, but in Japan a different system has been more widely adopted by consumers. I-mode currently has 12 million users in Japan. It uses a compact version of HTML (called cHTML) that allows for easier conversion of existing web pages (one of the difficulties experienced by WAP). I-mode phones have colour screens and faster download times. The manufacturer, NTT Docomo, plans a new high-speed service which it is claimed will transmit data 200 times faster than at present, enabling video and audio to be downloaded to phones and palmtop devices.



This anticipates so-called 'third generation' (or 3G) technology. General packet radio service (GPRS) is often referred to as a 2.5G system, and as with i-mode the significant advance is that handsets work on an 'always on' basis. This obviates the need to dial up for a connection, and is likely to provide a more popular charging model (that is, paying for the amount of data downloaded rather than per minute or second).

The limitations of WAP and similar standards lie mainly in available bandwidth. Future 3G standards (such as High Speed Circuit Switched Data, and Universal Mobile Telephone System) may allow faster and more stable mobile access to internet-like information. The first 3G networks are expected in 2002. While there are currently five different possible standards, recent initiatives such as the Mobile Data Initiative Next Generation (MDI-ng) between major manufacturers and communications companies suggest that the need for a common standard has been recognised.

Whatever advances are made in these platforms, limitations will remain with the current design of mobile phones due to the screen, battery and processor sizes possible. This is why it has been suggested that it is a combination of mobile phone and handheld computer which will offer a better and more popular experience of mobile ICT, facilitating a 'mobile information society'. The major manufacturers from each sector, such as Motorola and Palm, or Symbian (Motorola, Psion, Nokia, and Ericsson), are forming development alliances with this prospect in mind.

An early forerunner of this type of device is the Nokia 9110 Communicator, a cross between a mobile phone and a personal digital assistant, enabling internet access, telephone, fax and e-mail. A large number of successor products, based on current handheld and palmtop computers, is due to be launched within the next year.

#### *Video games consoles*

A new generation of video game consoles is being developed that are equipped with, or will provide the option for, internet access and e-mail. For example, the Sega Dreamcast has a built-in modem (in the UK model, 33.6 kbps), and only needs to be plugged into the home telephone line. It can access a range of audio file formats and web sites that use Macromedia Flash content. Users must utilise Sega's own internet service provider (DreamArena). However, Sega has announced it will be ceasing production of this console in its current form.

#### *Home telephone line penetration*

It is worth noting here that home telephone line penetration levels have never reached 100%, a fact that could be relevant to telephone line based systems of access to school information and resources.

Research suggests that an average of 5% of UK residences do not have a fixed line (OfTel 2000c). Overall, the majority of consumers living in homes without a fixed telephone line can be characterised by their low annual incomes, non-

skilled workers or not working, mostly living in rented accommodation, predominantly council-owned properties. However, about 1 in 10 are student groups, and a similar proportion are higher-income workers. Interestingly, preference for mobile phones was the main reason cited for not having fixed-line telephone, followed by cost issues. These were also the main reasons for not getting a fixed telephone in the near future. Cost was particularly an issue for those with outstanding debts, both to their previous telecommunications supplier and more generally.

It is notable that all the internet capable technologies outlined above have limited functionality that reduces how they can be utilised in home–school initiatives. Whilst the range of devices may increase the likelihood of pupils having access to the Internet in their homes, the varied mechanisms through which this achieved may also restrict or direct the type of initiative that can be developed because each technology affords a different range of possibilities.

Many of these devices do not provide the same quality of content, and in some cases provide access only to a limited range of content. This brings in questions of inequality that will be more or less pertinent depending on the aims and outcomes of initiatives. Moreover, as is implied above, inequalities in ownership of ICT do exist, and such disparities will be much more pronounced in relation to specific technologies. Furthermore, ownership does not necessarily equate with access or use, and these add further dimensions to issues of inequality that are worthy of consideration during the development of ICT-supported home–school links. ‘Digital divide(s)’ are likely to have an impact on the success of any initiative. The extent of the digital divide(s) is outlined below.

### 6.3 The Digital Divide(s)

Having outlined the main benefits, difficulties and recommendations arising from the wider literature, and discussing the technologies that might be used, it is pertinent to draw attention to and discuss the disparities in ownership, access and use that could mediate the effectiveness of initiatives.

Economic, cultural and social variations are very significant in relation to ICT-supported home–school links. Research has clearly identified the existence of ‘digital divides’ along various dimensions relating to technology such as computers, the Internet and digital TV. These are very often dimensions where inequalities have already been shown to exist, such as socio-economic status, gender, ethnicity, age, geographical location and disability. Any attempt to use ICT to develop home–school links may therefore run the risk of placing such groups at a further disadvantage unless appropriate measures are taken. Inequalities in terms of ownership, access, type and length of use have all been identified (*cf* Oftel 2001, ONS 2000, Becta 2001a, Becker 2000, Millard 1997, Downes 1998). Digital divide(s) therefore have ramifications for the way in which home–school initiatives are developed. This is especially relevant where learning occurs through interaction with objects such as

computers, and where such objects are utilised, accessed and perceived differentially in various cultures (Anning & Ring 1999).

Caddell (1996) notes that it is now 'widely recognised' that children's prior knowledge and experience needs to be built upon in order for schools to maximise benefits, yet prior experience, including experience with ICT, differs significantly. A recent study (Mumtaz 2001) supports findings from earlier studies, and highlights that prior home ownership and use lead to greater confidence and lower anxiety in the school setting.

Computers have been described as cultural artefacts that supplement rather than substitute for existing practices (Virtual Society 2000). If the social environments and conditions of use mediate the use of ICT, inequalities in the wider society may prove to be significant barriers to successful involvement with ICT home–school links amongst some groups. It has been found that many home–school links developed by schools and LEAs do not adequately account for experiences of the families from which the schools intake is drawn. Brooker (1999) found that the prescriptive 'common sense, taken for granted practices' often initiated by what they describe as 'liberal-progressive' educators are at times partly to blame for differential outcomes because they do not adequately reflect or share the same goals as their target audience. This has significant implications for any criteria used to assess what constitutes an effective initiative, and should also force us to think more carefully about when and how ICT can be used effectively.

It is suggested that practitioners should undertake data collection and analysis to ascertain the levels of inequalities in terms of ownership, access and use of ICT prior to developing initiatives. Compensatory practices should be considered and developed to overcome the specific inequalities each target population encounters.

## **SECTION SEVEN**

### **ICT AND HOME–SCHOOL LINKS: MODELS AND EXAMPLES**

This section of the report provides examples of the use of the technologies noted in the previous section, identifying the type of content made accessible via them, and also attempts to provide a guide to the varying models of ICT-facilitated home–school links.

#### **7.1 Existing home–school models**

According to research concerning home–school links discussed in section 4.1 of this report (Ball 1998), seven key types of home–school links were unidentified. Any particular initiative might include aspects of these. They are:

- ♦ decision making and management of the school – for example, participation in school governing bodies, parent/teacher associations and advisory committees
- ♦ communication between home and school
- ♦ school support for families – for example, regarding health, creating home conditions that support school achievement and social behaviour
- ♦ family and community help for schools – for example, assisting students, teachers or school management in the classroom or in other aspects of school activities
- ♦ school support for learning at home
- ♦ collaborations with community agencies – providing the school with access to community and support services for students and families
- ♦ community education – learning opportunities for all age groups, both within and outside the school and school hours

In terms of ICT-facilitated or -supported home–school links, a basic three-stage model has been developed (Cole 2000), consisting of:

- ♦ ‘basic’ school web sites, where parents and students can access general information – the so-called ‘static’ approach
- ♦ interactive sites – for example, those that enable access to student work and data and facilitate direct communication with the school via e-mail etc
- ♦ using ICT to engage students and parents in the learning process at home – for example, providing resources for home use.

However, using the technologies involved as the guiding factor, it is possible to construct a model with many more stages than this. This is outlined below.

## 7.2 Examples of ICT linking home and school

The various mechanisms for developing ICT-supported home–school links are presented below and are supported with examples of where they are in operation<sup>1</sup>.

### 7.2.1 Electronic communication

Electronic mail (e-mail) provides another possible channel of communication between home and school. The data in the previous section suggests that, given the higher rates of home internet access and the increasing number of schools on line, the opportunity exists for a proportion of home–school communication to be carried out via e-mail. However, data is not available regarding the extent to which this is actually occurring, and therefore it is difficult to assess extent of the advantages and issues for parents, students and schools.

#### *Examples:*

A number of schools encourage communication between home and teachers via e-mail, and this could be used in support of home learning. For instance, Hill View School, Sunderland:

<http://www.sunderland.com/hillview/parindex.htm>

See also:

<http://www.hitchams.suffolk.sch.uk/email.htm>

<http://www.rmpc.co.uk/eduweb/sites/khscolc/index.htm>

<http://www.bwctc.northants.sch.uk/website/html/updates.html>

Thomas Tallis School also produces an on-line newsletter for parents:

<http://www.thomastallis.greenwich.sch.uk/tallisonline/index.html>

E-mail could be used to encourage input into the school's management: for instance, the 'Ask a governor' e-mail facility at Woodland Grange Primary School, Leicester:

<http://www.woodlandwideweb.org.uk>

In addition, there have been initiatives involving voice-mail-based messaging systems in the United States, most notably the Bridge Project (see Bauch 1998). These give parents access to data relating to attainment and attendance, as well as serving as a communication channel for enquiries and general information to and from the school.

### 7.2.2 'Basic' school web site

Similarly, an increasing number of schools have their own web sites, which can contain varying amounts of information relating to the school which parents and students also receive through other channels. These can include term dates, contact details, prospectus-type information, and so on. However,

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<sup>1</sup> It must be noted that the examples provided were correct at the time the research was undertaken, but, given technological advances and changes in the aims and objectives of schools, in many cases this information may be outdated relatively quickly.

the amount of learning resources and, in particular the interactivity of these web sites are limited.

*Examples:*

<http://www.walsinghamcp.co.uk/maillist/>  
<http://www.edleston.cheshire.sch.uk/parents/parents.htm>  
<http://www.hitchams.suffolk.sch.uk/SchoolWebSites.htm>  
<http://www.headcornschool.freemove.co.uk/index.htm>  
<http://www.sunderland.com/hillview/parindex.htm>  
<http://www.parrswood.manchester.sch.uk/?file=ofsted-report/main>  
<http://www.edleston.cheshire.sch.uk/parents/parents.htm>  
<http://atschool.eduweb.co.uk/southwold/start.htm>

Horsforth School has a web site that advertises school activities and promotes use of its facilities by the wider community, and provides information relating to PTAs:

<http://www.leedslearning.net/members/4115/>

Cranford Community College offers a little more than a basic web site, with a more personalised approach to use of its site:

<http://intranet.cranford.hounslow.sch.uk/index.html>

### 7.2.3 Resource-rich or interactive school web sites

A smaller number of schools have used their web sites to host a greater amount of learning resources, including interactive resources, or to give students and parents access to data relating to attainment, attendance, and so on. As would be expected, this involves more sophisticated software and other technologies.

There is some commercially available software for these purposes. Microsoft Encarta Class Server is a curriculum management platform used to store curriculum materials, assignments, and assessment marks. Parents can access their children's homework assignments and marks, and students can also submit work on line. MyChildAtSchool.com from Bromcom is a specially designed web portal for parent and student access to a particular school's on-line resources. Parents are able to access a web site containing information such as their child's attendance, behaviour and homework record.

*Examples:*

Seven Kings High School offers extranet/intranet access to resources by students from the home:

<http://www.sevenkings.redbridge.sch.uk/>

At the Cornwallis Technology College school, learning materials are available on line and homework can be submitted electronically:

[http://www.cornwallis.kent.sch.uk/cvwebsite/gnvq\\_intermediate\\_it\\_support\\_she.htm](http://www.cornwallis.kent.sch.uk/cvwebsite/gnvq_intermediate_it_support_she.htm)

Monkseaton Community High School uses 'FirstClass' messaging and conferencing systems / Open University to enable pupils to link into school from home:

<http://www.ncl.ac.uk/Schools/zdclou/ewdev4.html>

Broadclyst Primary School offers an alternative approach, complimenting its web-based activities with a scheme for renting PCs to families for as little as £5 a week. With the aim of making pupils' homework an every day part of family life and extending the school's facilities into the home, pupils can link to the school's system (Total Interactive Multimedia System) via telephone lines.

<http://www.bcps.org.uk/>

*Additional examples include:*

<http://www.sutton.lincs.sch.uk>

<http://www.bwctc.northants.sch.uk/website/html/updates.html>

<http://www.litherland-high.sefton.sch.uk/News%20Page.htm>

<http://www.woodlandwideweb.org.uk>

[http://www.schoolmaster.co.uk/en/press/rel\\_croydon.html](http://www.schoolmaster.co.uk/en/press/rel_croydon.html)

<http://www.the-kings-osm.devon.sch.uk/frames.htm>

[http://www.schoolmaster.co.uk/en/press/test\\_kings.html](http://www.schoolmaster.co.uk/en/press/test_kings.html)

<http://www.millhill.org.uk/home.html>

[http://www.schoolmaster.co.uk/en/press/rel\\_abington.html](http://www.schoolmaster.co.uk/en/press/rel_abington.html)

<http://www.jan.freewire.co.uk>

[http://www.schoolmaster.co.uk/en/press/test\\_frey\\_andres.html](http://www.schoolmaster.co.uk/en/press/test_frey_andres.html)

<http://www.netherhall.cambs.sch.uk>

<http://www.charlesdarwin.bromley.sch.uk/>

<http://www.hitchams.suffolk.sch.uk/email.htm>

<http://www.burleymys.demon.co.uk>

<http://www.ambleside.schoolzone.co.uk/ambleweb/parents.htm>

<http://www.rmplc.co.uk/eduweb/sites/khscolc/index.htm>

<http://www.nettlesworth.durham.sch.uk>

<http://www.bgfl.org>

<http://atschool.eduweb.co.uk/clifton/pupils.htm>

<http://www.ridingshigh.org/pages/trace/trace.htm>

#### 7.2.4 On-line learning / 'virtual school'

A few initiatives rely solely on on-line learning resources: that is, there is no physical school establishment which students attend.

*Examples:*

CREATE (Centre for Research in Educational Applications of Telematics) is carrying out an evaluation of on-line-based learning accessible via the Internet from home, work, local learning centres, and so on:

<http://create.suffolk.ac.uk>

*Additional examples include:*

<http://www.onlinecollege.co.uk>

<http://www.learndirect.co.uk/>

<http://www.headcornschool.freemove.co.uk/VEAZ.htm> (a 'virtual summer school')

A variation on this theme has been devised by Knowsley Council and the North West Learning Grid, which use text messaging through mobile phones as a way of encouraging students to access on-line revision help and improve GCSE grades. Text messages are sent by 'soap' characters encountering similar exam pressures, and there are links to the web site, which has tips on exam techniques, revision and links to other useful sites. The scheme is a £10,000 six-week pilot to test impacts on learning, and will be assessed by participants:

<http://www.knowitall.org.uk/wan2lrn.htm>

#### 7.2.5 Student/parent/community use of school-based ICT facilities

Some schools have sought to make available their ICT resources to parents and the wider community, in order to ensure the maximum utilisation of these resources and so that non-students can access ICT. Many schools have held one-off events to introduce parents to ICT, such as showing them the school's ICT facilities their children will be using, or 'taster sessions' on the Internet and so forth. Other schools have initiated more sustained programmes of parental involvement and access (see LIFT 1998, TOP 2000a and 2000b for some examples). Further, a number of schools have bid successfully to become hosts for UK online centres.

*Examples:*

The School-Net initiative, based around the City School in Sheffield, makes available the spare ICT capacity in local schools to the surrounding community in the form of school-based community learning centres:

<http://www.school-net.org.uk>

Litherland High School in Sefton allows the use of its ICT suite three nights a week for students and study support. Stokesley School has a community education initiative that allows access to a 'cyber centre' for students and the community. Laptop computers are also available for loan to students. Community Step in Liverpool provides access to computers in three community centres and 28 primary schools in a deprived area, with the aim of developing the ICT skills and familiarity of parents (see Cole 2000).

*Additional examples:*

Ysgol Y Berwyn:

<http://www.gwead.cymru.org/uwchradd/berwyn/english2.htm>

See also the CREDITS initiative in Cumbria schools.

Parliament Hill School Has set up as Saturday ICT club for young people in conjunction with the local youth service:

<http://www.parliamenthill.camden.sch.uk/school01.htm>



Stokesley School Community Education, Stokesley, North Yorkshire is using ICT to reach out to students, parents and the community. It has a cyber centre in use throughout the day, afternoon and evening for young people and a 'Reach Out' programme that involves a tutor taking laptops to people in the surrounding villages:

<http://www.stokesley.co.uk/>

#### 7.2.6 Loan and subsidy schemes, including portable ICT schemes

ICT loan and subsidy schemes are intended to make ICT more easily available to students, especially to those unable to afford home computers. In doing so, they can help to form an ICT-supported home–school link.

##### *Examples:*

Hamilton School in Leicester leases portable computers to Year 6 and 7 students for £5 per week (see Frost 2000).

Microsoft's 'Anytime Anywhere Learning' project (Passey *et al* 2000), and the National e-Learning Foundation, are well-known plans to widen the use of portable computers in education.

The DfEE 'Computers within Reach' and 'Wired-Up Communities' initiatives also focus on providing ICT to those who otherwise would be unlikely to have access.

A more comprehensive initiative of this type is the Buddy Project, which has been taking place in Indiana in the United States since 1988. Its explicit aim is to extend learning beyond the classroom, alongside re-skilling parents in ICT and learning generally. The Buddy Project loans each teacher and student within the scheme a home computer, and provides a telecommunications network linking home and school. It also provides additional computers for classrooms. The 'BuddyNet' wide area network allows access to e-mail, bulletin boards, and commercial information resources as well as school information. It can be used for 'one-to-one' or 'one-to-many' synchronous real-time communication between students and their teachers:

<http://www.buddyproject.org/>

The initiative has included more than 20,000 families since its launch, and there are currently 70 schools involved in the main project and related schemes. However, the advent of the Internet has somewhat overtaken the technology underlying the Buddy Project, and has initiated a re-think. The focus on the connection between school, home and family and, in particular, extending learning beyond the classroom will be retained, but it will now involve a lower-cost solution of a computer with internet access for purchase by parents.

#### 7.2.7 Local TV – locally produced educational content on TV networks

There is a long history of television-based educational content, such as the work of the Open University, but there is also an example of locally produced content in the form of the Channel 7 local TV service in Grimsby, north-east

Lincolnshire. Amongst other programming, this has included locally produced education lesson programmes, and is supported by the Open School Network's on-line learning resources:

<http://www.osn.co.uk/>.

#### 7.2.8 'Community intranet'

The above models, with the exception of locally produced educational television content, rely on 'traditional' computing technologies such as home PCs and portable computers. However, the access and equity issues in relation to these technologies, and their varying ease of use, have led to an interest in using television to provide access to on-line resources and facilitate home–school links.

Television is, after all, the 'lowest common denominator' technology platform within each home. As noted in the previous section, the Internet can be accessed through a television set having a modem and the necessary software. However, there can be limitations when viewing and printing on-line resources, given the inability of most television e-services to save information. Further, a computer (PC) monitor has a higher resolution than a television screen, meaning that graphics and text do not look as sharp on a television.

#### *Examples*

'Community Intranet' from NTL allows access through PCs or digital television via the company's cable network. It is claimed that this initiative confers the benefits of increased continuity in the learning experience between home and school, increased communication between schools and parents, the ability to work on projects out of school hours, and access to a greater range of electronic-based educational content (NTL 2000). Parents and students can access the school intranet from home by using authentication passwords. The servers storing the intranet are maintained centrally by the company, in addition to support services. The core service provides the school with intranet tools to publish material on its intranet, such as timetables, homework diaries, and a school directory. In addition to a core intranet subscription, schools can purchase additional services such as web hosting and e-mail filtering.

#### *Additional examples:*

At the Telewest cable network in Telford, faster internet access has been provided primarily to benefit schools but will be accessible to homes via digital TV and public kiosks.

With the Leeds Learning Network, over 400 educational sites have been linked as part of a local broadband initiative via a managed service by BT which includes schools, libraries, local authorities, museums and colleges.

The ThinkLink project in Michigan, United States provides a video-on-demand cable link between home and school, as reported in Blanchard (1998).

### 7.2.9 Additional on-line resources of use to parents and pupils

Some on-line resources are designed to assist parents, such as the DfES Parents web site – <http://www.dfes.gov.uk/parents> – and the Parents Information Network – <http://www.pin.org.uk>. Others are targeted at students, and provide learning resources and other assistance, such as GridClub: <http://www.gridclub.com/>. There are many other freely available or subscription-based on-line learning resources. It is also worth noting the BBC's plan to provide 'digital curriculum' resources available via broadband internet and digital television, which is currently under review by the Department for Culture, Media and Sport. The BBC has partially justified its proposal as a link between home and school (BBC 2000).

### 7.3 Mapping a model of ICT and home–school links

In the table below, the 'technology model' and 'home–school link model' are presented to demonstrate the ways in which ICT can be and is used to facilitate initiatives. The table is an 'in progress' representation that will be further populated, refined and developed in the future.

Archived

**Figure 1. Models and Examples of ICT Home-school Links**

(To view use-Normal View)

<i>Shaded areas represent the technology model being used to support the type of home-school relationship.</i>	Example school / initiative / product	Home-school link relationship  <u>Decision-making and management</u>	<u>Communication</u>	<u>Support for families</u>	<u>Support for schools</u>	<u>Support for learning at home</u>	<u>Collaboration with community agencies</u>	<u>Community education</u>
Technology model:  <b>1. <u>Electronic communication</u></b>	In theory, every school with an e-mail address, but many may not have established dedicated procedures for electronic communication.	E-mail could be used to encourage input into the school's management. For example: 'Ask a Governor' e-mail facility <a href="http://www.woodlandwideweb.org.uk/">http://www.woodlandwideweb.org.uk/</a>	E-mail could be useful in helping to facilitate all of these types of home-school relationships.			A number of schools encourage e-mail between home and teachers. This can be used in support of home learning. For example: <a href="http://www.sunderland.com/hillview/pa/index.htm">http://www.sunderland.com/hillview/pa/index.htm</a>		

<p>2. <b><u>'Basic' web site</u></b></p>	<p>62% of secondary schools, 34% of primary schools have their own web sites (according to DfEE 2000).</p>	<p>Web site can be used to support management – for instance, agendas and minutes of meetings. For example: <a href="http://www.walsinghamcp.co.uk/maillist/">http://www.walsinghamcp.co.uk/maillist/</a></p>	<p>Web site can be used as an additional communication channel. For example: <a href="http://www.thomastallis.greenwich.sch.uk/tallisonline/index.html">http://www.thomastallis.greenwich.sch.uk/tallisonline/index.html</a></p>	<p>Web site can be used for support resources, but this is rare. For example: <a href="http://www.liverpoolcollege.org.uk/Questions/counsell.htm">http://www.liverpoolcollege.org.uk/Questions/counsell.htm</a></p>		<p>For example: <a href="http://www.edleston.cheshire.sch.uk/parents/parents.htm">http://www.edleston.cheshire.sch.uk/parents/parents.htm</a>  <a href="http://www.hitchams.suffolk.sch.uk/SchoolWebSites.htm">http://www.hitchams.suffolk.sch.uk/SchoolWebSites.htm</a></p>		
<p>3. <b><u>Resource-rich / interactive web site</u></b></p>	<p>MyChildAt School.com  Microsoft Encarta Class Server</p>		<p>Parents could keep updated, for instance regarding grades. For example: <a href="http://www.sutton.lincs.sch.uk/">http://www.sutton.lincs.sch.uk/</a></p>	<p>Information regarding health or childhood development could be held on the web site. For example: <a href="http://www.sutton.lincs.sch.uk/">http://www.sutton.lincs.sch.uk/</a></p>	<p>Could be a communication channel for the school to call for assistance, but ICT itself is not the vehicle for assistance.</p>	<p>Homework assignments and learning resources could be held on the web site. For example: <a href="http://www.bwctc.northants.sch.uk/web/site/html/updates.html">http://www.bwctc.northants.sch.uk/web/site/html/updates.html</a></p>		<p>Community learning resources could be held on the web site. For example: <a href="http://www.litherland-high.sefton.sch.uk/News%20Page.htm">http://www.litherland-high.sefton.sch.uk/News%20Page.htm</a></p>

<p><b>4. On-line learning / 'virtual school'</b></p>	<p>CREATE Learndirect <a href="http://www.learndirect.co.uk/">http://www.learndirect.co.uk/</a></p>		<p>Likely to utilise electronic communication between learners and institution.</p>	<p>On-line materials could include suitable resources.</p>		<p>On-line materials could advise on and support home learning. For example, the University of the First Age: <a href="http://atschool.eduweb.co.uk/ufa10/ufa.htm">http://atschool.eduweb.co.uk/ufa10/ufa.htm</a></p>		<p>If on-line learning resources are made available via local learning centres, community grids for learning, etc.</p>
<p><b>5. Community use of school-based ICT facilities</b></p>	<p>School-Net, Sheffield <a href="http://www.school-net.org.uk">http://www.school-net.org.uk</a>  CREDITS initiative in Cumbria schools <a href="http://194.154.15.73/cumbrianew">http://194.154.15.73/cumbrianew</a></p>		<p>Could act as a channel for greater communication, for example between parents and schools.</p>	<p>Could give parents access to information regarding health and child development</p>		<p>Could provide access to ICT and learning resources not available at home.</p>		<p>Could provide access to ICT and learning resources not available at home.</p>
<p><b>6. ICT loan / subsidy schemes</b></p>	<p>Hamilton School, Leicester, plus many other examples.</p>		<p>Could be used as a channel for communication, especially with additional provision of home internet access.</p>			<p>Could be crucial in ensuring home learning requiring ICT.</p>		

<p><b>7. <u>Local TV – locally produced educational resources</u></b></p>	<p>Grimsby Channel 7.</p>			<p>Locally produced content could include this type of material.</p>				
<p><b>8. <u>'Community Intranet' – widening access to on-line resources using digital television</u></b></p>	<p>NTL 'Community Intranet' initiative.  <a href="http://www.ntl.com/education/schools.asp">http://www.ntl.com/education/schools.asp</a>  <a href="http://www.ntl.com/education/community.asp">http://www.ntl.com/education/community.asp</a></p>		<p>In the sense that parents could use the system for keeping continuously updated, for example, regarding grades.</p>	<p>Information regarding health or childhood development could be held on the web site.</p>	<p>Could be communication channel for the school to call for assistance, but ICT itself is not the vehicle for assistance.</p>	<p>Homework assignments and learning resources could be held on the web site.</p>		<p>Learning resources could be held on the web site.</p>
<p><b>9. <u>Additional on-line resources of use to parents and pupils</u></b></p>	<p>DfES Parents web site  <a href="http://www.dfee.gov.uk/parents/">http://www.dfee.gov.uk/parents/</a>                  Parents Information Network  <a href="http://www.pin.org.uk/">http://www.pin.org.uk/</a></p>		<p>On-line resources to assist parental involvement in school management: for example, how to become a school governor:  <a href="http://www.dfee.gov.uk/governors/schgov.htm">http://www.dfee.gov.uk/governors/schgov.htm</a></p>			<p>GridClub  <a href="http://www.gridclub.com/">http://www.gridclub.com/</a>                  Plus many other freely available or subscription-based on-line learning resources.</p>		

## SECTION 8

### FURTHER ELECTRONIC EDUCATIONAL CONTENT AND INFORMATION USEFUL IN SUPPORTING HOME-SCHOOL LINKS

A wide range of resources available for use in the home are highlighted in this section, and examples and links are given. Some of the main issues relating to their use are discussed, but the main purpose is to illustrate to readers the sorts of possible resources that can and, in some cases, are being used to support of home-school initiatives.

#### 8.1 ICT-based resources supporting education in the home and supporting home-school links

The growth of e-learning, including on-line educational resources and CD-ROMs, provides a number of resources that allow parents and children access to a much wider range of home-learning materials than ever before. Digital learning through television channels will further add to this choice in the future.

These ever-expanding new technologies are potentially offering 'unmediated access' to resources from organisations that have been traditionally associated with education, as well as from other providers now entering the market. Parents need advice and support in choosing and using these resources, but they also need to be alerted to wider issues such as internet safety<sup>2</sup> and copyright/plagiarism.

Like teachers, parents need guidance on choosing computer equipment and high-quality educational resources to support their children's learning at home. They need to know where to find information about the curriculum and education in general, and to be guided to the most suitable resources that will support each stage of their children's learning. Parents look to their children's local school as a major source of educational advice, and many school web sites<sup>3</sup> are beginning to provide educational resources for parents and children.

Searching for homework information<sup>4</sup> is an on-going activity for parents and children. National and regional organisations play an important part in supporting parents in this respect. The Parents Information Network Educational Software Evaluation Scheme<sup>5</sup> evaluates software for parents. The

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<sup>2</sup> See, for example, GridClub – <http://www.gridclub.com> – and the NGfL safety site: <http://safety.ngfl.gov.uk/>

<sup>3</sup> See Hitcham's School, for example: <http://www.hitchams.suffolk.sch.uk/SchoolWebSites.htm>

<sup>4</sup> Continental Research 2000 'searching for homework information' was reported to be the most popular reason for children accessing the Internet (over half of respondents)

<sup>5</sup> <http://www.pin.org.uk/home/index.htm>



NGfL<sup>6</sup> and Becta<sup>7</sup> maintain on-line databases and catalogues of educational resources that parents can search. However, they may not always have the time, and therefore welcome gateway sites that save them time by drawing links together in one place, such as the DfES's Parents' Gateway<sup>8</sup>. Some regional broadband consortia<sup>9</sup> and LEA grids for learning<sup>10</sup> do this through parents' pages, and Becta's parents' trail<sup>11</sup> provides a sign-posting service for ICT information. Topical and informative on-line newsletters found on the Teachers Online web site<sup>12</sup>, and other sites that support literacy such as Stories on the Web<sup>13</sup>, will appeal to parents and teachers alike.

However, finding a range of information from a variety of sources is only one part of the story. Parents need help and guidance in how to support their children's learning at home. Building on the study support already provided for parents in more traditional ways, some schools are beginning to use their web sites to share this advice with a wider audience<sup>14</sup>. A small number of schools support home learning through the use of learning environments, and pupils can remotely access the school's intranet or send e-mail to teachers out of school hours<sup>15</sup>. There are also issues of study support for those children who do not have a computer at home, and parents also need to know where their nearest homework clubs<sup>16</sup> and UK online centres are to be found, their times of opening and other practical details.

Other than purchasing the relevant technologies to facilitate 'e-learning', the costs of purchasing software and subscriptions to on-line content are additional expenses for parents. Commercial companies approach parents direct through mail order catalogues such as BrainWorks, and parents need to make informed choices before purchasing. They also need to know where to find high-quality free resources on the Internet and which public libraries lend software to reduce or balance the cost of learning from home.

Digital broadcasting is expanding into the home, and companies such as the BBC<sup>17</sup> and NTL<sup>18</sup> are developing digital educational materials. Digital television and game consoles will allow parents and children access to this new digital content. A recent Ofcom survey<sup>19</sup> found 36% of households expressing 'an interest' in using them in the future for educational purposes. However,

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<sup>6</sup> <http://inclusion.ngfl.gov.uk>

<sup>7</sup> <http://besd.becta.org.uk/>

<sup>8</sup> <http://www.dfes.gov.uk/parents/>

<sup>9</sup> See <http://cleo.ucsm.ac.uk/parents/>, for example

<sup>10</sup> See the Birmingham Grid for Learning: <http://www.bgfl.org/bgfl/>

<sup>11</sup> <http://www.becta.org.uk/start/parents.html>

<sup>12</sup> <http://teachersonline.ngfl.gov.uk/>

<sup>13</sup> <http://hosted.ukoln.ac.uk/stories/>

<sup>14</sup> See, for example, Ambleside School:

<http://www.ambleside.schoolzone.co.uk/ambleweb/literacy.htm>

<sup>15</sup> See Cornwallis School, for example:

[http://www.cornwallis.kent.sch.uk/cwwebsite/gnvq\\_intermediate\\_it\\_support\\_she.htm](http://www.cornwallis.kent.sch.uk/cwwebsite/gnvq_intermediate_it_support_she.htm)

<sup>16</sup> See, for example: <http://www.southwark.gov.uk/learning/data/schoolout/index.html>

<sup>17</sup> BBC: <http://www.bbc.co.uk/consult>

<sup>18</sup> NTL: <http://www.ntl.com/education/default.asp>

<sup>19</sup> Ofcom 2000b Consumers' use of digital TV, summary of Ofcom residential survey, Q1 July 2000. August 2000: <http://www.ofcom.gov.uk/cmuresearch/digi0800.htm>

access to these resources using television sets and consoles will also have drawbacks. Restrictions such as space and time and competition over viewing the various channels, or use of particular games, are practicalities that may severely limit the extent to which the television can be used to access the Internet. The issues of unmediated access and the need for study support increase as these new technologies develop.

Finally it is important to realise that a different kind of learning occurs at home (*cf* Mumtaz 2001), and children need to be given the time and opportunities to develop other interests beyond school. It is argued that the home should not become merely a second delivery platform for the national curriculum<sup>20</sup>. Parents also need to know about other software that develops problem-solving and thinking skills<sup>21</sup>, and to realise that this is of value to their child's learning. When buying software, parents choose titles for different reasons than do teachers. While teachers choose titles which largely support delivery of aspects of the curriculum, for a parent it may be more important that the software maintains interest over a length of time, is value for money and is likely actually to be used. Games software is very popular because it is motivating, with the child encouraged to continue playing by high-quality graphics, sound, interactivity and challenging scenarios. Some games software can support the child's development of skills such as strategic planning, memorisation, organised thinking and collaboration. Other games use historical contexts, or expect the player to plan and make decisions based on information given. One alternative strategy that can be effectively employed by parents is to choose software that they consider not to be excessively violent or aggressive, and which promotes thinking skills and ensures that children discuss game play and strategies in order to consolidate their learning.

Listed below is a further collection of useful sites offering content for use in home learning. However, it is neither comprehensive nor exhaustive, and it is left to the reader to decide whether the content is of sufficient quality, is applicable to their needs and, moreover, whether this content might be useful for incorporating into initiatives linking the school and the home.

## 8.2 Further educational resources and content

In the remainder of this section we identify some further educational resources which are available electronically and which may be useful in supporting home–school links and promoting learning in the home. This provides a good starting point for parents, teachers and researchers to assess the availability and usefulness of existing on-line resources against their particular teaching and learning or research objectives. The selections included below represent a snapshot by way of example, and it is by no means an exhaustive or extensive list. Judgements about the quality of these resources are not made.

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<sup>20</sup> PINpoints (2001) Jacque Disney TES Online 9 February, p.28

<sup>21</sup> See, for example: <http://www.taglearning.com/> and <http://www.edmark.com/prod/>

On-line content by sector:

*Pre-school*

BBC Teletubbies

<http://www.bbc.co.uk/education/teletubbies/>

For children aged 0–3 years; encourages early reading.

BBC Tweenies (3–5 years)

<http://www.bbc.co.uk/education/tweenies/>

Activities to help pre-school children to develop basic maths, art, music and wider learning skills.

Channel4 Arcade

<http://www.4learning.co.uk/arcade/>

Sesame Street Workshop

<http://www.sesameworkshop.org/>

Spark Island

<http://www.sparkisland.com/>

*Primary*

BBC Dynamo

<http://www.bbc.co.uk/education/dynamo/home.shtml>

A home learning service for children aged 5–9, incorporating TV programmes, books, videos and the Internet.

BBC KS2 ReviseWise

<http://www.bbc.co.uk/education/revisewise/>

A wide range of activities and assessments to help Key Stage 2 pupils to make the most of what they know.

GridClub

<http://www.gridclub.co.uk/>

ICTeachers

A company of professional teachers offering on-line support to colleagues in schools. Useful Key Stage 2 SATs revision resources are available on site, thought out by teachers for teachers.

[http://www.icteachers.co.uk/children/children\\_sats.htm](http://www.icteachers.co.uk/children/children_sats.htm)

Kevin's Playroom

<http://www.kevinsplayroom.co.uk/>

REM Ed on the Web

<http://www.edontheweb.com/>

School Friend

<http://www.schoolfriend.co.uk/>

Spark Island

<http://www.sparkisland.com/>

### *Secondary*

#### BBC KS3 Bitesize Revision

<http://www.bbc.co.uk/education/ks3bitesize/>

This has much of the revision information pupils need, presented in 'bitesize' chunks. 'Revision Bites' and 'Test Bites' have been designed to help pupils to check what they know already. They can ask a teacher for help too.

#### BBC GCSE Bitesize

<http://www.bbc.co.uk/education/gcsebitesize/>

Material to help prepare with exams and help from an 'on-line teacher'. There is a chat room to share concerns and offer mutual support. Students will find most of the things they need here, from business studies to Spanish.

#### Career websites

<http://www.becta.org.uk/supportproviders/careersict/links/schoolsites.html>

<http://www.becta.org.uk/supportproviders/careersict/links/index.html>

#### Education Otherwise

<http://www.education-otherwise.org/Links/edresources.htm>

#### Eileen Tracy's Study Skills

<http://www.eileentracy.co.uk/>

Study Skills Counsellor with expertise in helping pupils to improve their memory technique, organisation, use of resources, note-taking and more. Information that might be helpful to teachers.

#### Encyclopaedia Britannica

<http://www.eb.com/>

#### GCSE Answers

<http://www.gcse.com/>

Students will find the answers to their English, maths, physics and French questions. This site carries the NGfL badge.

#### Kevin's Playroom

<http://www.kevinsplayroom.co.uk/>

#### Learn.co.uk

<http://www.learn.co.uk/>

This site from Guardian Education has more than 4,000 pages of curriculum material. Offers complete coverage of Key Stages 3 and 4 for maths, science, English language and English literature, as well as Key Stage 4 French. It is useful for the purposes of homework, revision and lesson preparation.

#### Project GCSE

<http://www.projectgcse.co.uk/>

#### Revise.it

<http://www.revise.it/reviseit/>

#### Revisiontime

<http://www.revisiontime.com/>

School Master

<http://www.schoolmaster.net/en/benefits/parents.html>

School Net

<http://www.schoolnet.org.uk/>

School Zone

<http://www.schoolzone.co.uk/documents/homepage.htm>

Schoolsnet

<http://www.schoolsnet.com/>

A range of free resources to help teachers, parents and pupils to achieve success in GCSEs. The site includes 30 Key Stage 4 lessons, more than 100 revision units, and a web guide to 12,000 of the best educational sites categorised by National Curriculum subject area and Key Stage level.

So cool!

<http://www.s-cool.co.uk/>

Revision tips for A- and AS-level and GCSEs. Help sheets on different topics taking learners through the basics with test questions on the subject afterwards. Includes a discussion forum.

*General schools*

AngliaCampus (subscription fee)

<http://www.angliacampus.com/>

On-line education service that supports the National Curriculum and contains information for parents to help them to support their child's education.

Channel4 Arcade

<http://www.4learning.co.uk/arcade/>

Education Otherwise

<http://www.education-otherwise.org/Links/edresources.htm>

Freeserve

<http://www.freeserve.com/learning/?redirect=int>

The Freeserve site offers help with revision for a variety of age groups (A-level, GCSE and Key Stages 1–3 SATs). It has approval from the National Association of Headteachers.

Granada Learning

<http://www.grnadalearning.com/home/>

Homework High

<http://www.homeworkhigh.com/>

Site for students aged 16 or under, including 'live' sessions where teachers are ready 'behind the scenes' to help students with their homework problems.

National Curriculum Online

<http://www.nc.uk.net/home.html>

Revisiontime

<http://www.revisiontime.com/>

Sam Learning

[www.samlearning.co.uk](http://www.samlearning.co.uk)

School Zone

<http://www.schoolzone.co.uk/documents/homepage.htm>

School Net

<http://www.schoolnet.org.uk/>

Virtual Teacher Centre

<http://www.vtc.ngfl.gov.uk/docserver.php?temid=13>

*Post-16*

BBC AS Guru

<http://www.bbc.co.uk/education/asguru/>

Revision web site currently provides detailed coursework, diagrams and activities for AS-level English, maths, general studies and biology, supported by TV programmes.

Career websites – some leads

<http://www.becta.org.uk/supportproviders/careersict/links/schoolsites.html>

<http://www.becta.org.uk/supportproviders/careersict/links/index.html>

Oxford School of Learning

<http://www.osl-ltd.co.uk/nethome.htm>

Project A-level

<http://www.projectalevel.co.uk/>

Revisiontime

<http://www.revisiontime.com/>

Revise.it

<http://www.revise.it/reviseit/>

### 8.3 Sources of information regarding educational software

Becta Educational Software Database

<http://besd.becta.org.uk/>

Education Green Pages

<http://www.education2000.co.uk/directory/greenpages.html>

Education Software Publishers Association (ESPA) on line

<http://www.uk.digiserve.com/espa/>

Emma Awards

<http://www.emma-foundation.org/>

Fischer Trust

<http://www.fischertrust.org/>

Guardian Education

Provides reviews and information on software

Headstart Software

<http://www.headstartsoftware.co.uk/>

Inclusion Web site

<http://inclusion.ngfl.gov.uk/>

Sherston Software

<http://www.sherston.com/>

Home user versions of educational software sold on line

TEEM

<http://www.teem.org.uk/>

Which? Online

<http://www.which.net/>

#### 8.4 General educational sites for parents and teachers

Many of the following resources may be useful in supporting teachers and parents to help children's education in general, whilst some assist parents and teachers directly in the use of ICT.

Advisory Centre for Education

<http://www.ace-ed.org.uk>

<http://www.inclusive.co.uk/support/ace.shtml>

Registered charity that helps parents to support their children in school. It publishes many books and information sheets, including many relating to ICT and inclusion. The publications aim to cut through educational jargon to help parents to understand the school system, but many professionals also use the publications.

Barnsley EAZ

[http://www.beaz.oneuk.com/parent\\_packs.htm](http://www.beaz.oneuk.com/parent_packs.htm)

[http://www.beaz.oneuk.com/treasure\\_hunt.htm](http://www.beaz.oneuk.com/treasure_hunt.htm)

Offers on-line content to enable parents to support their children at home, and also offer teacher resources.

Choosing Schools

<http://www.schoolsnet.com/cgi-bin/inetcgi/schoolsnet/scripts/national.jsp>

DfES

<http://www.dfes.gov.uk/parents>

<http://www.parentsonline.dfes.gov.uk/>

Homework

<http://www.standards.dfes.gov.uk/homework/>

Internet Safety

<http://safety.ngfl.gov.uk/>

National Curriculum

<http://www.nc.uk.net/>

Parents Information Network

<http://www.pin.org.uk/>

Parents Zone

[http://www.educate.org.uk/parent\\_zone/index.htm](http://www.educate.org.uk/parent_zone/index.htm)

Parent Teacher Association

<http://www.ncpta.org.uk/>

Reading and Language Information Centre

<http://www.ralic.rdg.ac.uk/>

School Governor

<http://www.dfes.gov.uk/governor/schgov.htm>

Archived



## SECTION 9

### ICT-SUPPORTED HOME–SCHOOL LINKS: RESEARCH FINDINGS

#### 9.1 Evaluated ICT-supported home–school link initiatives

There is limited research data available that specifically evaluates the effectiveness and benefits of ICT-supported home–school links. The research available focuses on different technologies, age groups and subjects, whilst initiatives have different approaches and objectives. Nonetheless, in relation to the categories identified earlier, it was found that the majority of existing research literature tends to focus on initiatives falling into the ‘school support for learning in the home’ category of home–school links. This may be a reflection of the prioritising and interest in practices that are most likely to bring about measurable gains in attainment. An overview of the main research on specific ICT home–school links is presented below.

##### 9.1.1 School support for learning in the home

The technology used to support home–school links does not necessarily have to be ‘advanced’ to be effective. ‘The Family Electronic Literacy Project’ (Topping *et al* 1997) used ‘low tech’, audio-taped books to achieve gains in all aspects of literacy for 8- to 9-year-old children in a mixed-ability class, and also produced improvements amongst some parents. The project sought to encourage collaboration and reciprocal participation between family members and schools. It built upon and valued existing home cultures and competencies, thereby offering greater opportunities and access for all family types.

Generally, reading rates and accuracy improved, and lower-ability children were found to benefit more than average. In comparison to ‘control’ groups, all ‘experimental’ children were found to have reported greater increases in positive attitudes toward reading and general enjoyment due to the use of the tapes. Whilst there were some problems with use of the tapes, their relative low cost, high compatibility, durability and user friendliness overcame many of the problems relating to access that can be associated with more ‘high tech’ media.

A subsequent, ‘higher tech’ approach to family electronic literacy using computers and the Internet was also undertaken (Topping 1997), using a literacy assessment, feedback and management programme (Accelerated Reader) to develop reading comprehension. Whilst it was noted that there are serious practical access, compatibility, and software quality issues that need careful consideration when trying to develop initiatives, if these can be overcome there is evidence to suggest that gains in literacy can be achieved. Using the Accelerated Reader programme, 14 levels of Family Link activities were subsequently undertaken that varied in intensity and resource and cost requirements. However, each of the 14 links provides a potential stepping

stone to greater involvement. A study undertaken in 2,500 American schools (Paul 1996, in Topping 1997) has shown that gains in reading tests can occur regardless of the levels of hardware in schools, whilst a Scottish study (Vollands, Topping & Evans 1996, in Topping 1997) demonstrated that Accelerated Reader results in gains in reading achievement and motivation to read.

'The Connecting the Home, School, and Community Project' (Smith & Anderson 1994) in the US provided portable computers for use by low-achieving 15- to 16-year old-language arts students, many of whom were from Hispanic backgrounds. It was found that the computers motivated pupils, and enabled them to organise their thoughts and produce more presentable work as a result of redrafting and editing, whilst the portability of the computers was reported to facilitate and encourage parental involvement. This was further enhanced through school-based parental instruction about the ways in which the computers could and were going to be used. The project was part of a wider initiative that involved communication and collaboration between the teachers, pupils and parents from a number of schools across the state. The authors state that the reasons for the projects success was due to the combination of telecommunications, low-cost computers, family involvement, and the use of a structured approach to improve writing skills.

Swick (1992) conducted the 'School–Home Early Childhood Curriculum Project' in the US, aimed at enhancing school success amongst 90 'at risk' children. Families and teachers were involved in a teacher–parent partnership programme that integrated maths and technology concepts and skills into kindergarten and first grade instructional programmes. The results showed that the project led to positive effects on outcomes, and that learning objectives were achieved. This was partly the result of extending the power of the curriculum beyond the formal classroom and focusing the involvement and efforts of teachers and parents.

The initiative incorporated many other design and deployment aspects thought to be essential to the success of the project. These included:

- ♦ teacher and parent training
- ♦ clear pedagogic and instructional strategies
- ♦ the deployment of home–school workers
- ♦ home learning extension strategies, such as home visits, involvement of parents in classrooms, greater parental communication and home learning activities
- ♦ a home-loan computer programme: there was a computer learning aspect to the programme in which parents, pupils and teachers were all involved, and it was reported to be a 'unifying force' of shared experience.

The 'Study Skills for Success Programme' (Forgatch & Ramsey 1994) used videotaped interventions to support the development of a home–school link project. The intervention was aimed at improving the quality of students'

homework, promoting parental involvement, and enhancing communication between home and school, and providing support for pupils homework was undertaken amongst 49 junior high school students and their parents. Students identified as experiencing 'academic problems' were randomly split into 'experimental' or 'control' groups to test the effectiveness of the intervention. Parents in the experimental groups reported increased knowledge of their children's homework activities as a result, whilst their children reported improvements in the quality of their homework. The videotape was used to inform pupils and their parents about the type of practice and study routines they should undertake on a daily basis. Parents were also encouraged to monitor and reinforce their children's efforts, whilst teachers provided daily report cards describing homework and school performance. The study was found to be a cost-effective way of using ICT to co-ordinate the efforts of parents and teachers toward a shared objective.

Elementary school children in the US were involved in a pilot project where they did their homework on a telecommunications network that enabled teachers to undertake electronic grading and record keeping (Mountain 1992). Pupils were provided with computer access in their own homes. The project included collaboration between numerous parties, including teachers, parents, business sponsors for supply of equipment, and a university faculty. Initially, the project was conducted with one school in a disadvantaged area but spread, with the aid of sponsorship from businesses, to others in the area. It was reported that children using the technology averaged two hours a week of 'extra credit' homework during school months, and also accessed the network during holidays for work on maths, reading and writing exercises. Overall, it was reported that the use of an educational technology system that involved doing homework on a network increased the amount of academic time spent on task.

Two different reports on the same project in the US make for interesting reading, as they reach quite different conclusions.

McMahon & Duffy (1993) examined the 'Buddy System Project' in terms of its impact on school learning environments, the impact and use of telecommunications functions, and the home computers' impact on the home environment. Access to technology was made available by loaning each student and teacher in selected Indiana elementary schools a home computer, modem and printer, as well as providing a school computer:pupil ratio of approximately 1:4. In addition, all homes and schools were linked through e-mail, bulletin boards and a 'chat channel'.

Qualitative data were collected from 28 homes and 19 classrooms in four schools and, overall, the project was considered a success by all the schools involved. Teachers and parents reported that extensive use of computers had positive effects on students' reading, writing and typing proficiency, as well as on aspects of communication through electronic media. In terms of impacts on school learning environments, the system increased the amount of ICT used. It was reported to lead to benefits in terms of raising self-esteem, 'equalising students', providing greater opportunities to practice in content or

skill domains, increasing co-operative learning and enthusing teachers. The overall culture in classrooms also moved to one that was more co-operative as skill and knowledge exchange became more widely distributed and teachers started to rely on pupil expertise. In relation to the impact and use of telecommunications functions, it was found that pupils were empowered and had greater opportunity for interaction, particularly those who were less comfortable with face-to-face communication. The e-mail function also facilitated greater levels of communication between the home and school, and some on-line tutoring arose. The impacts it had on the home environment and family involvement included the use by pupils for homework purposes, which led to even greater parental involvement, and use of computers by parents and siblings for a number of reasons, many not related to school.

It was concluded that computers are most effective in a student-centred instructional model, and when used for clear learning goals rather than computer goals. Initiatives are also more likely to be successful when there are several innovators prepared to take chances.

Another evaluation of same project (Miller & McInerney 1995) focused on its effects on reading, language and mathematics achievements for students over one and two years of the project. A total of 142 fourth and fifth grade students were given a computer, printer and telecommunications equipment in their homes for use in learning activities, and changes in their test scores were compared with 147 students without use of such equipment in another school in the same state. It was found that participation in the project did not result in increased academic achievement. It is argued that educators should enter into home–school ICT projects with caution and realistic expectations, as benefits may be limited to areas such as increased motivation, self-esteem, parental involvement and changes in learning environments. There were some favourable outcome measures in favour of the ‘experimental group’ in mathematics in the final year of the project, and this is attributed to either teachers becoming more accustomed to the technology or the evolution toward a non-linear approach in the kinds of software used.

### 9.1.2 Community education

#### Ennis: Information Age Town

Ennis capitalised on a £15 million investment by Eircom over five years (1997–2002) to provide integrated information and communications technologies, infrastructure and training. The town has been described as the largest community technology project in the world, as the majority of households (83%) had a multimedia computer linked to the Internet. Free computer familiarisation was offered to residents, and free telephone connection was offered to those without. Every child had access to a computer, and businesses and public services were equipped to exploit the potential of the information age. A number of benefits arising from the scheme have been reported. As might be expected, calls to the Internet increased, numbering four times that of comparable towns. ICT is also reported to have been used more extensively in school projects and, as a result, greater creative writing

has been facilitated. Knowledge was gained and shared between family, friends and neighbours, and best practice was disseminated throughout the community. Computers were used for a variety of reasons, and the residents' programme encouraged social inclusion.

Nonetheless, it has been found that ICT does not guarantee meaningful use or benefits. Programmes tend to be most successful when they build upon existing social and organisational contexts, and partnerships have proved crucial to their success. However, for a section of the community, ICT still has no relevance and remains unaffordable. Many people do not have the opportunity to participate, for the same reasons that they do not participate in other aspects of society – such as disadvantage, literacy difficulties or low income (Eircom 2000).

### 9.1.3 School support for families / collaboration with community agencies

Laptop leasing initiatives appear to be more commonplace, particularly following the establishment of the Government's National e-Learning Foundation and projects facilitated through the local foundations. However, as yet there is little available data surrounding their effectiveness and the impact they have on home–school relationships. There are a number of commercially based projects that have employed a similar model by creating numerous partnerships to offer low-cost leasing schemes that enable pupils to have full-time ownership of portable technologies. Some of these have produced 'findings', but benefits as yet cannot be said to be wholly or directly attributable to the effects of ICT-supported home–school links.

Although not specifically a home–school project, the Anytime Anywhere pilot programme (Passey 2000) assessed the outcomes of a Microsoft-supported programme implemented in 28 schools whereby parents lease laptops for sole use by their children. Whilst the implementation of the scheme has been diverse amongst the 28 schools, a total of 645 pupils across all ages and 370 teachers have been involved in the programme. General findings indicate that laptop use in schools and homes can be successfully implemented with significant benefits. These include increased use of laptops outside school, use for homework, and the facilitation of more challenging home-based work. Other gains included better writing skills in English, better data handling in science and maths, and increased confidence, self-esteem, motivation and presentation, particularly notable amongst special needs pupils. It has been found that, whilst e-mail is being used increasingly by parents to contact teachers in some schools, generally there has been limited progress overall with home–school links, and most of what happens remains at a level of physical transfer of laptops and disks.

Toshiba has been deploying portable devices incorporating the Microsoft Anytime Anywhere Learning programme. Reported benefits for teaching and learning have been partly attributed to greater access to powerful software and the extension of the learning beyond the classroom. The portability of the laptops means that transfer of information between the home and school

is possible and, where available, can be used to access school LANs, intranets and the Internet. In cases where full-time ownership has been facilitated, parents have been able to improve their own computer skills and also keep up with the progress of their children (see, for instance, Hamilton College – Toshiba 2000).

The extension of school work and benefits arising from the development of increased parental involvement were outcomes also identified in other portable projects (*cf* Stradling *et al* 1994, Bowell *et al* 1994, Gardner 1994)

## 9.2 Benefits and issues identified in the wider ICT literature

The section above highlights the benefits reported to have arisen from the more specific ICT-supported home–school links. The following section draws on relevant findings from broader associated research literature that identify benefits and other significant findings pertinent to ICT-supported home–school links.

A number of emerging models for developing home–school links were identified by researchers in the Impact2 study (McFarlane *et al* 2000), which suggests that ICT is being increasingly perceived as a tool for facilitating home–school links. These include:

- ♦ portable devices being used as containers for carrying instruction between the home and the school
- ♦ computers in the home linked through networks
- ♦ more radical links via technologies such as mobile phones. (Details of such links from the Impact2 study will be examined when more detailed findings become widely available).

This trend is likely to continue as more schools make their ICT facilities available for out-of-hours use by pupils and the local community. Findings from the Pathfinder project (Becta/Bristol University 2000) identified that a large number of the educational institutions studied already had ICT development plans, which considered various ways of using ICT beyond ‘formal’ schooling. Evidence suggests that an increasing number of pupils have the necessary skills, would be in favour of the development of links using ICT, and that impacts could be beneficial. Moreover, it has been identified that informal learning environments can provide important supplements to the formal school environments (Mayer *et al* 1997).

Preliminary findings from the Impact2 study have identified that high proportions of pupils have a rich range of experience with ICT at home, particularly with the Internet and games.

This has significant impact upon their confidence and skills with ICT, and is also likely to lead to more appropriate use. In turn, home use has been found to have a significant impact upon pupils attitude to technology, their confidence and competence levels (McFarlane *et al* 2000, Mumtaz 2001), suggesting that increased emphasis of ICT use in the home as well as the school may be beneficial, particularly when parental involvement is enhanced.

Evidence from the Pathfinder project (Somekh 2000) has identified that a significant proportion of students wish to use ICT for school work, and that many institutions are investing considerable resources into web-based delivery of curriculum content, highlighting schools' willingness to develop links. There is also evidence that students' learning experience could be enhanced. The 'sense of an audience' and ability to present work to others has been found to be an essential factor in fostering creativity and skills using ICT (Sefton-Green & Buckingham 1998). It may follow that such aspects are enhanced if parental involvement in school-related activities is facilitated through the incorporation of new technologies.

It has also been identified that tools such as networked technologies can alter relationships and redefine who the learners and teachers are, whilst technologies such as intranets can potentially be used as mechanisms through which to scaffold independent learning and increase the pool of resources available (McFarlane *et al* 2000). Increased parental involvement may further maximise the resources available and the variables favourably impacting on outcomes. Therefore, the potential beneficial impacts of ICT-supported home–school links would appear significant in terms of both teaching and learning and management of the curriculum and school. However, this may be dependent upon a number of contextual and environmental factors being in place.

Findings also suggest that the majority of parents would also be receptive. Swick (1992) noted that parents are 'deeply interested' in becoming more actively involved in their children's education when there is a system that not only invites but actually pursues participation. Miller & McInerney (1995) suggest that, whilst benefits in terms of attainment gains are difficult to assess, aspects such as increased parental participation, greater self-esteem and motivation can be more readily identified. Whilst some evidence suggests a correlation between levels of school ICT resources and attainment (Becta 2001a), there is more conclusive evidence to suggest that ICT can lead to improvements in affective aspects such as motivation, self-esteem, attitudes and confidence (*cf* Mumtaz 2000). Such aspects may be pre-requisites for improvement in other areas of education. Moreover, parental involvement has also been identified as having a positive impact on attainment and, as noted above, the capacities and functionality of ICT offer an important added dimension to home–school links in facilitating greater communication and involvement between the home and school. In some cases there is further opportunity for children to practise in certain skill or subject domains, and for parents to increase their knowledge of their children's school, learning objectives and curriculum subjects. Forgatch & Ramsey (1994) also state that there is clear evidence to show that parents need regular and accurate information regarding their children's performance at school. As noted previously, various types of ICT such as intranet, Internet and Bromcom systems can now offer a mechanism for fast and efficient delivery of such information and material.

### 9.3 Barriers and difficulties identified in the wider ICT literature

One potential difficulty facing those developing ICT-supported home–school links are the variations that have been found to exist between young people’s use of ICT in the home and that in the school (see, for example, Downes 1996, Selwyn 1998, Mumtaz 2001). Until recently, children’s use of ICT outside the school has been largely overlooked. However, recent findings suggest that young people appear to adopt a different style of use in informal settings. This may have implications for identifying approaches and factors, including form and content, that might be included in order to have the most appeal and produce the greatest benefits.

Sefton–Green & Buckingham (1998) found that creative uses of home computers are generally rare. This was attributed to a combination of the limitations of software, economics, parental guidance and control and narrow conceptions about ‘educational computing’ amongst significant others. Of those using computers in the home, it has been found that use tends to be largely for pleasure and leisure purposes, and tends not to include educational software (Facer *et al* 2000, Downes 1995). This more ‘exploratory’ approach is said to stem partly from a sense of control and pleasure (Downes 1999), and differs from more structured approaches used extensively in schools (Van Duuren 1994). It clearly contrasts with the use of the ‘computer as pacifier’ which has been identified as a characteristic of usage in some primary schools (Selwyn & Bullon 2000). Mumtaz (2001) found that the majority of children preferred using the computer at home rather than at school, largely because of the greater control and fewer restrictions over the time and type of use. Moreover, in comparison to school use, which was dominated by use of word processing packages, the home computer was used largely for a wider range of activities, but most regularly game playing. Buckingham (1999) found that children reported word processing to be time consuming and boring, whilst Crook & Kerawalla (2001) report that a more playful approach to use of the home computer often occurs despite the educationally oriented purchases of ICT by parents. Importantly, whilst three-quarters of parents surveyed stated they had bought computers to support their child’s work at school, it was rare that they became directly involved in activities surrounding their child’s use of ICT at home (Crook & Kerawalla 2001).

It has been identified that links between the home and school tend to diminish as pupils get older (Shartrand *et al* 1997, Caddell 1996). Whether using ICT to develop home–school links in the later stages of compulsory education will help rectify this situation remains to be seen. However, the use of ICT may help to overcome some of the associated barriers because it does not necessarily require face-to-face, school-based, synchronous use or face-to-face contact of ‘traditional’ parent–teacher engagement. What is more, the greater skills of older pupils may be more suited to particular types of ICT-supported home–school links.

The above factors are likely to have significant implications in terms of the viability, design and content of home–school initiatives supported by ICT. This implies that initiatives may be more successful when accounting for the whole



range of skills and interests of pupils and parents, including those not necessarily linked to the formal curriculum. Downes (1999) suggests that we may have to give greater consideration to the competencies and approaches that children adopt in the home context, and to reflect the changing relationships between pupils, their parents and schools that may arise as a result of incorporating ICT into home–school relationships. Perceptions surrounding the use and utility of home computers have been identified as being mediated by individual family discourses and wider learning communities (Downes 1998, Tobin 1998). Findings from one of the largest community telecommunications projects in the world (Eircom 2000) identify that, 'programmes are most successful when they build upon existing social and organisational contexts' (p 49).

Despite the variations in the type of use between the home and the school, children with access at home are more likely to be confident and competent users of the technology (Downes & Reddacliff 1996, Mumtaz 2001, Kirkham 1993). However, it has been found that even when young people have prior home use and experience there is no guarantee that this will translate into enthusiasm for school use. This has been attributed to the fact that the 'skills approach' often taken by schools can be incompatible with the varied use undertaken by pupils in the home. The 'skills approach' was found to benefit some pupils but often alienated the more ICT-capable pupils (Becta / Bristol University 2000). Moreover, it has also been identified that there are groups of young people who have little interest in using computers (Facer *et al* 2000).

Hartley & Brown (1999) identify barriers that deter young people's willingness to participate with ICT, particularly with aspects such as on-line discussion. These are:

- ◆ feelings of intimidation, or that other students know more than they do
- ◆ a lack of spontaneity on discussion boards
- ◆ the challenges involved in getting access to computers
- ◆ lack of the required time
- ◆ lack of self-motivation
- ◆ because non-verbal communication can be misinterpreted
- ◆ group cohesion is hard to attain on line if students do not know each other off line
- ◆ lack of willingness to participate on line if they see one another regularly in real life
- ◆ insufficient social and societal arrangements to encourage free collaboration and share information.

Selwyn & Bullon (2000) have noted that many teachers are also unaware about how computer technologies are being used by young people in their homes, and are often unable to give adequate guidance to pupils toward the more effective uses of the technology in schools. This indicates that insufficient teacher skills and awareness may have implications in terms of the

development of ICT-supported home–school links. Similarly, Tyler–Eastman & Hollingsworth (1998) uncovered that students had far greater exposure to ICT outside the school than in it, and that pupils often have greater experience than previously supposed. As with classroom use of ICT, the need to have appropriate levels of staff and resource backing is likely to impact upon the effectiveness of initiatives.

Findings from the Pathfinder research (Becta / Bristol University 2000) highlight that, despite many schools having ICT development plans that consider the use of ICT outside the schools, both technical and subject-specific support for the use of home-based technologies seemed to be lacking. Provision for those without access is a significant issue, particularly given the diversity of both home and community-based access. Similar issues were uncovered by ‘Pathfinder’ researchers at Manchester Metropolitan University (Somekh 2000), who also found that relatively few schools listed ICT training, support for parents, governors, or the wider community as key targets. The Parents Information Network (2000) found that the majority of ICT support offered to parents is reactive in nature and rarely initiated by the school. As few as 4% of primary schools have included ICT in their home–school agreements, and generally it is suggested that there is a need for support and awareness raising in this area for school management teams, as support currently tends to be ad hoc and piecemeal.

Lack of evidence about the cost effectiveness of initiatives is likely be one of the issues of greatest significance to schools. Moreover, there is reticence amongst many teachers to suggest that ICT can help to raise standards (Becta / Bristol University 2000). Miller & McInerney (1995) identified that significant positive impacts upon academic achievement as a result of home–school computer projects do not always occur, and they suggest that educators have to be realistic about the outcomes that arise from such initiatives. They further state that, regardless of the technology, the teacher still remains the greatest influence on children’s learning. Again, this may present difficulties. McMahon & Duffy (1993) report that initiatives are dependent on a large amount of extra effort by the teachers to learn software and keep up with the students, and a lot of effort and energy is needed to get initiatives started. This places significant demands on teacher effort and time, and such factors may restrict schools’ and teachers’ willingness to support initiatives. Teachers’ willingness to participate actively in home–school links is likely to vary significantly and therefore impact upon the efficiency of initiatives

Developing home–school links using ICT also requires a fuller understanding of the disparities that exist amongst different family groups. Findings from the Impact2 study (Becta 2001b) identified that there is a significant difference in ownership of home computers amongst Key Stage 4 pupils in favour of the highest ranked social groups. There was also strong relationship between home access to the Internet and socio-economic status, ranging from 18%–54% at Key Stage 2 and 45%–82% at Key Stage 4. Moreover, the catchment area and socio-economic status seem to be strongly correlated with the proportion of children that have access to computers at home and also, and

perhaps just as importantly, their perceptions regarding the importance of educational software packages. Physical designs and resources on offer in schools and in pupils' homes have been found to vary significantly, and this can also have a bearing on access to 'learning success' (McFarlane *et al* 2000). Facer *et al* (2000) found similar differences, and also found that lower socio-economic status groups tended to have computers that were older and of inferior quality. Home–school links, particularly where parents or wider community members become involved in using school resources, may have serious financial implications for schools in terms of wear and tear, supervision and support resources. Links may also add further pressure on parents to purchase ICT, especially if their children cannot access ICT in the home. Despite the Government drive to provide 'universal access', Stock (2001) argues that offering community-based access is not sufficient and does not afford the opportunity for parents to engage in aspects of their children's schoolwork.

The success and the viability of ICT-supported home–school initiatives will also be mediated by each school's overall ICT infrastructure, views about the use of technology for out-of-school activities, the ICT competencies of the teachers and pupils and also their broader perceptions about home–school links. Some technologies may represent more suitable options than others for some schools in terms of aims and cost, and links may need to be tailored accordingly. Moreover, the particular aims schools wish to focus upon make particular aspects of ICT more useful than others. Some schools may be less willing to participate, particularly in aspects that may lead to the wider use of scarce or expensive resources. This may be compounded further through the incompatibility of software and hardware used in the home, fear of viruses and transferring them to school systems.

#### 9.4 Factors contributing to the success of ICT-supported home–school links: findings from research

From the research literature previously outlined, it is notable that none of the initiatives identified worked in isolation from other mechanisms for delivering learning (or wider) objectives. A range of factors underpinning the success of initiatives have been identified. These are summarised below and supplemented by a supported by other factors identified in the wider associated literature as being influential in obtaining positive outcomes. However, it must be remembered that such factors are derived from diverse sources and may not be applicable to all initiatives and contexts.

The main factors identified in the literature include:

- ◆ clarification and agreement surrounding the aims and goals of home–school links (Swick 1992)
- ◆ the use of appropriate ICT to facilitate links and achieve desired objectives
- ◆ sufficient technical and subject support resources
- ◆ clear and effective pedagogical and instructional strategies (Swick 1992)

- ◆ restructuring initiatives to emphasise ‘key concept’ learning, if applicable
- ◆ the adoption a range of outcome assessment methods, that do not necessarily link directly to formal measures of educational attainment
- ◆ parental involvement with the technology and engagement with children’s learning objectives
- ◆ a platform or mechanism for parents and teachers to refine processes for involvement as children progress through school (Swick 1992)
- ◆ parent and teacher training in both ICT and home–school link development
- ◆ closer involvement of teachers with families and development of a greater understanding of needs, wants and cultural backgrounds leading to sensitive and appropriate design and execution
- ◆ the collection and use of reliable empirical information regarding pupils’, teachers’ and parents’ prior experience with computer technologies outside the school: links must then aim to provide appealing content, reflect competency levels and be supported by policies that account for discrepancies in ownership and experience (Monteith 1996)
- ◆ the use of a number of diverse strategies to encourage parental participation, such as home visits, conferences, training programmes, newsletters and informal contacts, as well as through ICT itself (Swick 1992)
- ◆ possible deployment of home–school liaison workers and development of ‘homelink’ post within schools (Swick 1992)
- ◆ partnerships and sponsorships for building and exchanging social capital and increasing sustainability
- ◆ the existence and identification of innovators who are prepared to take chances

Home-loan computer programmes can support ICT home–school links and be beneficial in terms of achieving objectives. Where laptop schemes are in place, the following factors have been shown to be important:

- ◆ adequate focus upon, and understanding of, how laptop use supports and enhances the curriculum
- ◆ a focus on learning and the need to understand pupil uses
- ◆ understanding and flexible handling of the social needs of all involved
- ◆ management committed to partnerships with parents and others
- ◆ building in parental confidence and interest
- ◆ actively involving parents and providing training
- ◆ providing at least minimum levels of technological support and maintenance.

(Passey 2000, p 6)

## **SECTION 10**

### **CONCLUSIONS AND DISCUSSION**

There is relatively limited research into specific ICT-supported home–school links, and much of what is available focuses upon different aims and objectives and incorporates various technologies. In particular, there is very little UK research or case study material. This makes it difficult to conclude that the findings comprehensively support the hypothesis that ICT-supported home–school links have a positive impact on learning.

However, when research findings from specific ICT-supported initiatives are considered alongside data from wider research into home–school links, and the broader ICT in education literature, a picture emerges that suggests that ICT can play a positive role in facilitating and mobilising links in a number of exciting, innovative and beneficial ways. This is not just in terms of its direct educational potential and impacts on attainment, although these are notable, but also in building better lines of communication, changing the way educational content is presented and delivered, and building social capital between individuals and groups within communities. There are many potential and practical benefits of using ICT in home–school initiatives. However, any advantages may be as much a reflection of process of parental engagement and accentuation of particular aspects of their children’s learning and school life as they are the result of inherent capacities encapsulated within the technology. Similarly, the closer involvement and understanding of families by schools and teachers may be another critical variable, and, whilst the technology may facilitate this understanding, it is the individual practices that remain most important. In this sense, ICT can be seen as a tool for obtaining positive outcomes through increasing parental involvement and intensifying the focus upon the learning process but is reliant on the initiative, willingness and hard work of the individuals involved to be really successful.

The development of home–school links represents an opportunity for capacity building through the involvement of the greatest number of interested individuals. The sharing and pooling of resources and collaboration between parties represents the building of social capital that is central to greater participation, sustainability, and benefits those involved. Initiatives can include both explicit and implicit, and formal and informal aspects of learning, and feelings of inclusion are particularly enhanced when participants feel they have been consulted in decision-making processes.

Nonetheless, the potential for the incorporation of ICT-supported links is still very much in its infancy and yet to become established within the fibre of individual school and local or national policies, although a general trend in this direction is detectable. As has been identified, this has to some degree been further facilitated through the diverse range of new technologies that exist and which can be utilised in a number of ways to achieve broad range of objectives. Such technologies are becoming more commonplace and increasingly utilised by schools to encourage relationships and collaboration

between with the home and wider community. Furthermore, content that helps to support such links has also become more widespread. Informative findings from the literature are included in this report to help advise practitioners and policy makers wishing to develop initiatives. However, there is a need to collect more data and examples of good practice to further inform this process.

Perhaps one of the most notable findings from the research is that benefits arising from ICT-supported home–school links were more likely when there was:

- ♦ clarity about aims and objectives
- ♦ strong pedagogical and practical strategies for delivering learning objectives
- ♦ mechanisms for promoting parental and/or community involvement
- ♦ specific enthusiastic and/or influential individuals.

Without effective support, ICT is unlikely to have any great effect, and the above factors and other contextual and environmental aspects, many as yet unclear or unrecognised, are also likely to impinge upon the success of initiatives. Whilst increased collaboration and family involvement tend to be beneficial, effective technical and educational strategies also need to be in operation (Swick 1992), as do sensible and practical approaches toward family involvement (Smith & Anderson 1994).

The different approaches required and objectives pursued through the development of ICT-supported initiatives require careful consideration of the style, extent and conditions of use in the home. These have been shown to be quite distinct from the ways in which ICT is used in the school, and may give an indication of the ways in which technologies may be best applied and suggest that home–school initiatives should not necessarily 'bolt on' directly to existing curriculum aims. Moreover, Noll *et al* (2000) suggest that parental intervention is necessary to turn home computers into effective learning tools. However, it has been identified that there are significant differences in the capabilities of parents to do so. This aspect of the digital divide will have implications for home–school links and their impact, as will other aspects such as differential ownership, access and use.

It is therefore clear that there is a need for more comprehensive and coherent research in the field. What exists tends to focus specifically on 'school support for learning' rather than other types of home–school models. Research varies in quality and length, deals with a range of initiatives, objectives, contexts, technologies and user groups, and reports a range of outcomes that vary considerably. Comprehensive and coherent research projects and data collection processes need to be in place to identify more clearly which factors are most likely to be influential in obtaining positive outcomes. Such aspects include the sort of infrastructure necessary, levels of home ownership and the thresholds of skills and/or access to the technology required for teachers, pupils and parents in order for initiatives to be successful.

## SECTION 11

### RECOMMENDATIONS AND SUGGESTIONS FOR PRACTITIONERS AND POLICY MAKERS

A number of recommendations, suggestions and questions for consideration are presented below that have been informed by the literature and research findings already cited pertaining to both ICT-supported home–school links and the wider data. Whilst this is not a complete, comprehensive or prescriptive list in light of the specific circumstances and objectives of each school, it does identify some factors that may be worthy of consideration in planning and developing initiatives. It also highlights some of the areas in which future policy development may be warranted.

Prior to developing ICT-supported home–school links, it may be useful to consider the following:

- ◆ What are the goals, aims and objectives? These should include pedagogical, instructional and broader developmental aspects.
- ◆ What are the mechanisms for achieving these goals?
- ◆ How will the aims and goals be decided?
- ◆ How can ICT help in attaining these goals?
- ◆ Are particular types of ICT more useful in achieving these goals, and why?
- ◆ Develop internal evaluation of initiatives to identify benefits and weaknesses and inform future practice.
- ◆ Ensure that management is committed to partnerships with parents and others.
- ◆ Ask whether all parties, including parents and children, have been consulted regarding the form and content of home–school link initiatives.
- ◆ ‘Sell’ rather than impose the concept of home–school links to all involved. Engage and seek the commitment of teachers and parents.
- ◆ Do partnerships and sponsorships exist that can help in building and exchanging social capital and increasing sustainability and improving cost-effectiveness?
- ◆ Harness the resources available in the wider community, attract multi-agency support and, where possible, involve powerful partnerships supported by other agencies
- ◆ Identify the roles, responsibilities and individuals associated with home–school links and consider implications relating to safety, access locations and unequal access.

*With specific regard to issues related to inclusion:*

- ◆ Are the social needs of all involved understood and handled sensitively and flexibly?

- ◆ Consider developing initiatives that are not merely extensions of curriculum material, and methods of delivery that may be likely to appeal to those less happy with formal approaches to education.
- ◆ Consider how to develop the skills that many children already possess and use outside school.
- ◆ Initiatives should account for the views of all parents. Contemplate the possibility of building links around existing family practices and routines.
- ◆ Develop mechanisms to ensure that cultural and social differences are incorporated, and constantly re-evaluate initiatives in light of the changes in the target population and barriers and constraints encountered.
- ◆ Avoid prescriptive approaches that may alienate the most marginalised groups and decrease feelings of ownership. Initiatives should be sensitive to problems and difficulties that already exist in the wider community (DfEE 2000).
- ◆ Develop knowledge about levels of home access, abilities and use of ICT amongst pupils and their parents, and develop understanding about broader competencies and interests amongst families and cultural groups. This sort of data collection prior to the development of ICT home–school initiatives could form the first stage in the development of stronger ties between parents and schools.
- ◆ If all parties do not have the necessary access to ICT to enable them to participate equally, consider putting mechanisms in place to overcome these disparities.
- ◆ Develop clear plans of how initiatives will be implemented, and involve all groups.
- ◆ Are specific aspects for consideration identified, such as SEN requirements and literacy development amongst both pupils and parents?
- ◆ Consider developing certain aspects of initiatives to target groups ‘at risk’ of exclusion and non-participation.
- ◆ Is appealing content provided that also reflects competency levels and is supported by practices and policies that account for discrepancies in ownership and experience?
- ◆ Consider what constitutes a home–school link and think about the meanings of many associated terms such as ‘parental involvement’ and ‘home’, as these may exclude some groups from participation.

*In terms of participation:*

- ◆ Use one or more of a number of diverse strategies to encourage parental participation initially, such as home visits, conferences, training programmes, newsletters and informal contacts, as well as through ICT itself.
- ◆ Identify home-learning extension strategies to increase communication and involvement with parents.



- ◆ Clear and effective mechanisms for communication need to be identified and established between all parties involved, creating a concept of shared responsibility for children's learning.
- ◆ Empower young people by involving them in a process of consultation and initiative development to increase feelings of ownership and responsibility.
- ◆ Are mechanisms for increasing parental confidence and interest in place? Reduce psychological barriers that prevent parents from feeling that they can make positive contributions to their child's formal education, and also in using ICT. Ensure that parents can see they are having a positive impact. Take measures to develop parental confidence.
- ◆ Develop confidence-building and motivational activities and exercises for pupils.
- ◆ Do home–school liaison workers or 'homelink' posts exist within schools? Home visits by teachers or other representatives of the school may also be beneficial in building relationships.
- ◆ Are there interested, motivated or innovative individuals prepared to take chances whose talents can be mobilised?
- ◆ Where possible, use role models and influential personalities from amongst groups least likely to participate.
- ◆ Develop mechanisms to maximise shared pools of knowledge and expertise available amongst both teachers and parents.

*With regard to training:*

- ◆ Do teachers have adequate ICT skill levels and training relating specifically to the development of home–school links? It has been identified that teacher preparation for family involvement is often insufficient (Shartrand *et al* 2000)
- ◆ Have the levels of confidence and skill necessary for teachers, parents and pupils to engage in effective home–school links been identified or considered?
- ◆ Are parents actively involved, and is any training provided or necessary?

*With regard to technology:*

- ◆ Plans should be drawn up on a school-by-school basis identifying how ICT can be best used in the development of home–school links. This would include which technologies were to be used, and how and why these would be most suitable for achieving the aims and objectives of the overall initiative.
- ◆ Ensure that there is adequate focus and understanding of how the technologies can support and enhance aspects of learning, even where these are not explicit.
- ◆ Are sufficient technological and human support resources in existence for the particular initiative to run effectively?

*In terms of policy:*

- ♦ More coherent funding may be needed to support the development of effective ICT-supported home–school initiatives.
- ♦ It may be useful to incorporate issues around family involvement through the use of ICT into pre-service and in-service teacher training and education programmes as a fundamental aspect of training. Teachers might benefit from direct experience of working with families and utilising ICT in the process.
- ♦ A framework of content areas for teacher preparation leading to the development of the skills and knowledge building necessary for teachers to work effectively with families include:
  - general family involvement
  - general family knowledge
  - home–school communication
  - family involvement in learning activities
  - families supporting schools
  - schools supporting families
  - families as change agents.

(Shartrand *et al* 1997)

- ♦ Develop tools for evaluating home–school links. Whilst evaluation is an important factor in helping to disseminate knowledge about effective approaches, care must also be taken not to make the tools of evaluation too prescriptive. They should be flexible and sensitive enough to assess successes in terms of a range of outcomes and objectives and not merely those relating to ‘formal’ educational impacts.
- ♦ Develop a national network to support teacher preparation in family involvement using ICT. Include mechanisms for modelling developments, evaluation of schemes and dissemination of information drawn from a range of national organisations, as well as developing ‘case studies’ of best and effective practice.
- ♦ Teacher preparation for involvement with families, both generally and using ICT, could be accentuated in policy guidelines.
- ♦ Encourage collaboration between schools and with other professional agencies to increase information and resources pertaining to home and community relationships.

## SECTION 12

### GAPS IN THE RESEARCH: AREAS FOR FUTURE INVESTIGATION

There are many areas worthy of future research and investigation in relation to ICT-supported home–school links. Generally, there are significant limitations in terms of both the quantity of existing data, and in some cases its reliability.

Future research projects might specifically address some of the most fundamental questions, such as:

- ♦ What added value can the use of ICT offer to home–school relationships?
- ♦ What effects do the development of ICT-supported home–community links have on the structure, organisation and management of schools?
- ♦ What are the skill requirements and confidence levels necessary for effective involvement amongst pupils, parents and teachers? It would also be useful, as would an evaluation of various aspects of home–school related training.
- ♦ How cost effective are the various types of ICT-supported home–school links?

However, to answer many of these questions adequately, a range of more comprehensive research projects needs to be developed.

Longer-term projects that track the development of initiatives and the ways in which various ICT are used to achieve a range of aims and objectives need to be undertaken to help provide greater information about the overall impacts and outcomes of ICT-supported home–school links. As with the wider home–school links research, there is a need to conduct research of a wider scope and scale in ICT-supported links as there is scarce information available

Further work should be undertaken to classify and create models of ICT home–school links. These should also consider the theoretical and pedagogical approaches underpinning the initiatives, their overarching aims and the specific technology utilised. For example, Shartrand *et al* (1997) identify four differing approaches underlying the aims of home–school links. These are the *functional approach* (based on Epstein 1992), the *parental empowerment* approach (based on the work of Cochran 1987), *social capital* (Coleman 1988), and the *cultural competence* (Moll 1992) approaches. Whilst there is not space here to expand on these approaches, future research could attempt to highlight these and evaluate which might be the most successful in particular contexts and under which specific circumstances. Greater and clearer identification of the effectiveness and limitations of specific technologies in facilitating home–school links also needs to be undertaken.

Benefits from home–school initiatives do not always occur in a uniform manner or in a clearly identifiable way, nor are they implemented into comparable contexts. Therefore it would appear vital that future research

uncovers and provides wider information about the contexts in which they occur, thereby uncovering specific impacts and particular variables impinging on outcomes and factors necessary for success. Moreover, in presenting a richer picture of the contexts in which initiatives occur, practitioners are provided with clearer information on which to base their judgements about approaches that are most suited to their particular circumstances. Selwyn (2000) suggests that greater utilisation of qualitative methods should be used to 'illuminate' and support quantitative data, providing a more searching tool for investigating cultural and contextual factors and impacts, so that the range of mediating factors can be considered when analysing the outcomes of initiatives.

*Other questions that need further investigation include:*

- ♦ What are the differences in involvement with ICT home–school links along various dimensions such as socio-economic status, ethnic origins and gender?
- ♦ How can differentials in ownership, access and use be overcome to maximise benefits in ICT-supported home–school links?
- ♦ What are the perceived barriers to participation?

Future research and ICT-supported home–school links themselves might explore and exploit the wide diversity of knowledge and skills that already exist in different social and cultural backgrounds. This would incorporate a greater examination of the effects of the various 'funds of knowledge' (Moll *et al* 1992) and the development of bi-directional home–school knowledge exchanges in a bid to increase knowledge about mechanisms for raising participation, particularly amongst 'excluded groups'.

Research might consider:

- ♦ How best might cultural assets be mobilised through bi-directional ICT home–school links?
- ♦ How can parental skills be identified and mobilised through ICT home–school initiatives?
- ♦ How does mobilising the various cultural assets through ICT home–school links transform teaching, learning and outputs?

It would also be useful to highlight and develop methodologies and data collection tools appropriate to identify the assets based in the communities schools serve, and devise ways in which these assets can then be incorporated effectively into home–school links initiatives to ensure the greater parental and community participation. Asset-based approaches to the development of community technology have been identified in the US literature (*cf* Pinkett 2000) as one of the most effective and sustainable ways to involve the wider (learning) community and build social capital. This sort of approach is not explicit in any of the research into UK projects.

**APPENDIX**  
**APPROACH TO THE LITERATURE SEARCH AND SOURCE**  
**IDENTIFICATION**

Searches focused on research evidence on the effectiveness of ICT-supported home–school links. Further searches encompassed additional material relating to non-ICT-supported home–school links, parental and family involvement in children’s education, home access to and use of ICT, and homework.

Bibliographic databases were systematically searched to identify published literature – including journal articles, technical reports, conference literature and books – reporting research evidence and other relevant information. The contents of recent volumes of several leading journals were also checked. A general set of keyword terms was developed on the basis of the project briefing.

Archived

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