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Summary

There is limited research evidence relating to effective ICT support for schools, although some studies and reports have identified the key categories of support and have suggested ways in which various models of support can enhance the provision of ICT in schools. The following key issues are identified:

- High-quality ICT support leads to wider use of ICT in schools
- ICT support can account for up to 34% of the total cost of ownership of ICT resources
- ICT support programmes should include all aspects of support, including curriculum and technical support
- There is a difficulty in recruiting and retaining ICT technicians in schools owing to their comparatively low status and pay

What the research says about ICT support for schools

This report is based on an analysis of available research about ICT support for schools. It summarises the key findings and suggests resources for further reading.

What is ICT support?

The term, 'ICT support' is used in this briefing to describe the resources and services that are available to schools which assist them in their provision of ICT. These services include those which provide support for schools' ICT equipment, as well as those which assist schools in developing, planning and implementing the ICT curriculum.

The research analysed for this report typically deals with two broad areas of ICT support:

- Technical support, which covers all aspects of managing the ICT infrastructure. Becta's Technical Support Advisory Service (TSAS) has identified four key areas of technical support: Proactive – which involves the prevention of incidents before they occur, Reactive, involving the fixing of incidents once they have occurred, Strategic – making sure technical support meets the school's needs, and Change – managing ICT changes. Technical support can be provided locally by individual members of staff in a school or by external bodies who are contracted by the school to supply such services.
- Curriculum support, which involves providing assistance and guidance for schools in their use of ICT in the curriculum, the provision of and support for ICT training for staff, and advice and services regarding the purchase of equipment. These services are most commonly provided to schools by their LEAs.

To judge which types and models of ICT support within these categories are the most effective in assisting schools with their ICT provision, it is necessary to examine the available research evidence.

Becta
ICT Research

Key research evidence about ICT support for schools

On the basis of Becta's analysis, support for ICT can be provided to schools in many forms. The key models of ICT support, and the evidence relating to how these models are best implemented, are outlined below (there are references for further reading supplied alongside some of the findings).

General Issues

- Teachers in schools with higher quality ICT support are more likely to use technology in their teaching, and in a wider variety of ways, than teachers receiving lower quality support (Ronnkvist et al., 2000)
- Continuing support for schools and teachers, both in technical terms and in how to integrate ICT with subject teaching, will enable them to reap the benefits of the Government's investment in ICT (Becta/DfES, 2002a)
- ICT support is a significant aspect (up to 34%) of the total cost of ownership of ICT hardware and software, which is often underestimated by schools and LEAs (Ofsted, 2001; Harley and Wendel, 1999; Becta/DfES, 2002d)
- Technical support needs to be more fully integrated with curriculum support in order to adequately assist teachers in using ICT effectively (Becta/DfES, 2002c)

Technical support

- Lack of technical support, in terms of on-site technician support and web-based and telephone support, restricts the effective use of ICT in schools (PriceWaterhouseCoopers, 2001; NGfL, 2002)
- ICT technicians often experience a lack of career structure and low pay, despite being highly qualified and undertaking a variety of tasks (PriceWaterhouseCoopers, 2001; JAPONITE, 2001)

- ICT technicians would benefit from a funded training programme specific to their role. This could include basic pedagogical skills (Becta/DfES, 2002a; JAPONITE, 2001; Williams et al., 2000)
- Most schools' technical support is provided by a teacher with no additional time allocated for the task (Kington and Kendall, 2001; Ofsted, 2002; JAPONITE, 2001)
- Regional Broadband Consortia (RBC) often supply high-quality technical support to the schools they serve. This support provides high levels of access and reliability to schools. (Ofsted, 2002)

Curriculum support

- ICT support from LEAs needs to focus on enabling schools to fully integrate ICT with the curriculum, and not just on issues of technical support (Ronnkvist et al., 2000; Bird, 2001; Ofsted, 2002)
- Where LEAs have developed partnerships with commercial training providers to support NOF training, this has allowed the training to be tailored to schools' individual needs, and the training has been more effective as a result (Ofsted, 2002)
- Where ICT support programmes are designed specifically with the needs of schools and teachers in mind, schools' use of ICT is greatly improved (Ronnkvist et al., 2000)
- Teachers benefit from sharing their knowledge, ideas and resources, through the use of online communities and dedicated websites. This professional dialogue can act as a stimulus to their use of ICT. (Williams et al., 2000; Ofsted, 2001)

Factors for effective use

- ICT support programmes should be comprehensive, and include all aspects of ICT support services, including those related to hardware, staffing, personal assistance and professional development. (Ronnkvist et al., 2000; Ofsted, 2001)
- Where LEAs provide funding for ICT support in addition to that provided by central grants, schools benefit from the resulting broader scope of support they receive. (Ofsted, 2002)
- Using a Managed Service, where schools obtain a whole range of ICT support from one central provider, can give schools the advantage of being free to concentrate on the effective use of ICT to improve teaching and learning. (McMullan, 2002; PriceWaterhouseCoopers, 2001)

About Becta's 'What the Research Says…' series

This series of briefing papers is designed in particular for teachers, ICT co-ordinators and school managers, in order to provide an initial idea of the available research evidence for the use of Information and Communications Technology (ICT) in schools and colleges. We welcome feedback and suggestions for further titles in the series (contact details can be found at the end of this briefing).

ICT support for schools in practice

Cranford Community College, in the Greater London Borough of Hounslow, makes extensive use of ICT, through its status as a technology college, language college and adult education centre. It employs four ICT technicians to provide its own technical support, and also extends these services to six of its largest feeder schools.

The primary schools each pay a fixed annual amount to the college, which gives them the benefit of having predictable costs, and in return they have access to the college's technicians on a call-out basis. The fact that the feeder schools are all within a few minutes' drive from the college makes this system very practical. All the schools in the cluster chose the same standardised equipment, which is compatible with the college's systems, and this makes the sharing of technical support much more cost effective.

In addition to the support provided by the resident technicians, the college and the feeder primaries are also supported by contracts with their hardware providers, and the primaries also buy in support from their LEA which covers all of their electronic equipment.

The college has also provided NOF training, and encourages its technicians to give informal training to staff across the cluster when possible. This has allowed staff the benefits of meeting together and developing the skills and confidence to do more for themselves.

More details of this and other case studies regarding approaches to technical support in schools can be found at http://www.technicalsupport.ngfl.gov.uk/.

Explanation of findings

As with ICT more generally, positive effects of ICT support for schools depend on the ways in which that support is provided. Drawing clear conclusions on the effects of ICT support from the range of research evidence and reports available can be problematic. There are a number of factors that limit effective comparisons, such as differences in sample sizes, methodologies and effects, and the extent and type of ICT support involved.

Much of the literature tends to focus on specific providers of ICT support. The main sources of support that are dealt with by the literature can be grouped under the headings that follow.

Resident ICT technicians

The need for computer systems to be fully functioning in schools at all times requires regular preventative maintenance (proactive support) and fast responses to problems when they arise (reactive support). Teachers do not have the time and often do not have the expertise to adequately perform this role. As a result, schools have a need for their own ICT support technicians. The importance of this role is often undervalued, however, and this is reflected in technicians' comparatively low status and pay. Recommendations include the establishment of a professional body for ICT technicians, and the introduction of nationally recognised qualifications, training initiatives and career structures, specific to the needs of the role. (JAPONITE, 2001; PriceWaterhouseCoopers, 2001; Williams *et al.*, 2000)

The cost to schools of employing a resident technician can be prohibitive; one study found that only 12% of surveyed schools employed a resident technician (Kington and Kendall, 2001). Some schools have overcome this problem by forming clusters in which a full-time technician is shared between them, while others have made use of technology students on work placement or technically skilled classroom assistants (Ofsted, 2001; TeacherNet, 2002)

Local Education Authorities (LEAs)

Effective support is provided by those LEAs which strike a balance between the provision of support for ICT infrastructure, for teaching and learning with ICT, and for ICT planning. Some LEAs have provided effective support to schools in the delivery of NOF training, working with commercial training providers and tailoring the training to the needs of individual schools (Ofsted/Audit Commission, 2001; Ofsted, 2002.) There is a need for LEAs to provide further support to ICT leaders in co-ordinating, monitoring and evaluating the ICT work in their school. LEAs should also provide focused classroom support to improve teaching with ICT, and should monitor and evaluate ICT teaching and standards in schools (Bird, 2001).

Managed Services

The term 'managed services' is used to describe a package of services offered to schools from a single service provider. Such services are often provided to schools by commercial companies, but can also be supplied by LEAs and RBC (Regional Broadband Consortia – see below).

Managed services offer schools the advantage of being free to concentrate on raising standards in teaching and learning through the effective use of ICT, having handed over the technical responsibilities to a third party (McMullan, 2002; Ofsted, 2001; Levy, 2000). There is also a depth of expertise available to schools, through managed service providers' pools of specialists (Levy, 2000) although schools can lack the expertise needed to ensure that managed service contracts are properly drawn up and contractors deliver good service. (Becta/DfES, 2002b)

Regional Broadband Consortia (RBC)

RBC are consortia of local authorities involved in the procurement of Internet services, broadband infrastructure and content for LEAs and schools in their regions. Ofsted found that the improved reliability of broadband supplied by RBC affected teachers' confidence and raised the overall level of ICT use in schools. An RBC also offers technical support through service level agreements; this ensures high levels of access and reliability. RBC are now developing effective content for schools which makes use of the high-speed connection.

Recommendations include the need for RBC to further promote their role and services, to make more schools more aware of the support available to them (Ofsted, 2002).

Models of peer support

Computer mediated communication (CMC) systems have provided teachers with the ability to establish online communities, giving them access to professional dialogue and support from their peers. No study has been carried out into the use of CMC specifically to support ICT, but a study into the benefits of a mailing list for Special Educational Needs Co-ordinators (SENCOs) found that CMC creates an effective support network. It provides a forum for expert debate and gives teachers access to professional knowledge and advice that might otherwise be unavailable (Parker and Bowell, 1998; Lewis and Ogilvie, 2002).

Becta supports a growing number of online discussion forums which offer practitioners the opportunity to discuss issues relating to the effective use and management of ICT (see **http://www.ictadvice.org.uk/talk** for details).

Key questions for schools

- When planning for and purchasing ICT infrastructure, do you give adequate consideration to the total cost of ownership of the equipment, and the fact that ICT support can contribute to up to 34% of this total cost?

- What are the key tasks that should be carried out to ensure that ICT support is managed effectively? How can technical support provide an efficient service to meet the needs of the users in your school?

- If your school does not have a resident ICT technician, is there any scope for collaboration with other schools to employ and share a technician?

About the research literature

There is relatively little research evidence available regarding ICT support for schools. Much of the information that is available is in the form of reports or articles, rather than from refereed research evidence. However, many of the reports referred to in this paper are from respected sources, based on carefully considered judgements by education and ICT professionals, and as such provide a valuable contribution to this briefing. Other evidence is available in the form of case studies of specific schools or support providers, which help to give useful, working examples of how the issue of ICT support might be tackled in different situations.

Where research evidence does exist, this tends to focus on explaining specific models of ICT support available to schools, the extent to which they are used and suggestions on how they might be improved, rather than comparing the various models and their impact on the use of ICT, which could arguably be more useful to practitioners. Much of the UK evidence deals only with specific aspects of ICT support, often treating curriculum support and technical support as two separate issues; a more constructive approach is adopted by much of the evidence from the United States, which looks at ICT support as a whole, considering every area of ICT in which schools need to be supported, and therefore illustrating the most effective ways to provide a complete programme of support to schools.

Key areas for further research

- Gathering of further research evidence of the ways in which schools can be, and should be, supported in their provision of ICT
- Study of the effects of different models of ICT support on teachers' and pupils' use of technology in schools, and comparison of the effectiveness of different models
- Further investigation of models which address all aspects of ICT support, including technical and curriculum support, staffing and training.

Becta's ICT Support Network

The ICT Support Network is a partnership of ICT support providers operating at national, regional and local levels in the UK to support schools and colleges in their use of ICT (see http://www.becta.org.uk/ictsn for details).

Becta's Accredited Service Suppliers

The Accredited Service Suppliers scheme (see http://www.ictchoice.org.uk) allows schools to purchase with confidence from suppliers that have been awarded accreditation by Becta. A rigorous and lengthy testing process is used to identify suppliers who have demonstrated to a high degree that they can provide guaranteed levels of service, and that they can provide quality and performance.

Becta's Technical Support Advisory Service (TSAS)

TSAS is a new service from Becta which aims to help schools improve the efficiency of their ICT management and ensure that the technical support provision meets the needs of the users in the school. The TSAS web pages provide technical support advisory materials specifically designed for schools, and an online community for peer-to-peer discussion, sharing ICT best practice and problem-solving help focussing on technical support staff in schools. See http://www.becta.org.uk/technicalsupport for details.

Bibliography and further reading

The research referred to in this briefing represents a selection from the developing field of research into ICT support, and should not be regarded as a definitive list of the 'most important' research in this area.

BECTA, 2003. Technical Support Advisory Service (TSAS) Technical Support Survey Results. Becta. http://www.becta.org.uk/technicalsupport

BECTA/DFES, 2002a. ImpaCT2 - Pupils' and Teachers' Perceptions of ICT in the Home, School and Community. DfES research and evaluation series 9.

BECTA/DFES, 2002b. NGfL Pathfinders: Second report on the roll-out of the NGfL Programme in ten Pathfinder LEAs. DfES Research and Evaluation series 10.

BECTA/DFES, 2002c. NGfL Pathfinders: Final Report on the roll-out of the NGfL Programme in ten Pathfinder LEAs. DfES Research and Evaluation series 11.

BECTA/DFES, 2002d. Total Cost of Ownership: a review of the literature. DfES Research and Evaluation series 6.

BIRD, S., 2001. Good practice in LEA support for ICT in schools. http://www.lgiu.gov.uk/GKpubs/ GoodPracticeTEN.pdf

HARLEY, D., AND WENDEL, T., 1999. Technical Support Planning: Best Practices for Alberta School Jurisdictions. Edmonton: Alberta Dept of Education.

JAPONITE, 2001 (July). A report on the employment of IT technicians in schools. Joint Advisory Panel on Information Technology in Education (JAPONITE).

KINGTON, A., AND KENDALL, L., 2001. 'Annual survey of trends in education: information and communications technology (ICT) in the primary school.' *NFER digest*, (11) Autumn 2001).

LEVY, M., 2000. 'Taking care of the network: Managed Services: how many schools are using them and are they working in practice?' *Educational Computing and Technology*, pp. 26-31.

LEWIS, A., AND OGILVIE, M., *2002. The impact on users of the National Grid for Learning, SENCO-forum e-mail list : Research report to Becta/DfES.* Birmingham: University of Birmingham. http://www.becta.org.uk/page_documents/ teaching/senco-forum1.pdf

MCMULLAN, T., 2002. Wired to learn: what's holding up the school of the future?, Adam Smith Institute (Research) Ltd.

NAACE, 2001. What does an LEA with quality ICT support look like?, NAACE. http://www.naace.org/resourceView.asp? menuItemId=2&resourceId=56

NGfL, 2002. NGfL ICT technical support - Case Studies. http://www.technicalsupport.ngfl.gov.uk/display.php3? section=learning&id=18

OFSTED, 2001. *ICT in Schools: The impact of government initiatives - an interim report April 2001.* Ofsted, London. http://www.ofsted.gov.uk/publications/docs/1043.pdf

OFSTED, 2002. *ICT in Schools: Effect of government initiatives - progress report April 2002.* Ofsted, London. http://www.ofsted.gov.uk/publications/docs/19.pdf

OFSTED/AUDIT COMMISSION, 2001. *Local Education Authority Support for School Improvement.* The Stationery Office, London. http://www.archive.official-documents.co.uk/document/ofsted/lea/lea.pdf

PARKER, B., AND BOWELL, B., 1998. 'Exploiting computer-mediated communication to support in-service professional development: the SENCO experience'. *Journal of Information Technology for Teacher Education*, **7** (2), pp. 229-246.

PRICEWATERHOUSECOOPERS (PWC), 2001. *Teacher workload study: final report.* http://www.teachernet.gov.uk/ docbank/index.cfm?id=3165

RONNKVIST, A.M. *et al.,* 2000. Technology Support: Its Depth, Breadth and Impact in America's Schools. Teaching, Learning, and Computing: 1998 National Survey Report #5. Irvine, CA Minneapolis: Center for Research on Information Technology and Organizations Minnesota Univ.

TEACHERNET, 2002. Collaboration within a cluster of schools. ICT support. TeacherNet. http://www.teachernet.gov.uk/management/resources financeandbuilding/funding/smallschoolsfund/cluster/

WILLIAMS, D. 2000. 'Integrating information and communications technology in professional practice: an analysis of teachers' needs based on a survey of primary and secondary teachers in Scottish schools'. *Journal of Information Technology for Teacher Education*, **9** (2), pp. 167-182.

This briefing and others in the 'What the Research Says' series can be found on the Becta Research web site at: **www.becta.org.uk/research**

Becta's ICT Advice site provides further information, services and tools for those who use, implement and manage ICT in schools: see **www.ictadvice.org.uk.**

Becta's ICT Research Network

If you're interested in research on the use of ICT in education, you can join Becta's ICT Research Network.

The ICT Research Network seeks to encourage the exchange of information in order to inform the national agenda and professional practice.

Membership is free and is open to:
- teachers
- ICT co-ordinators
- ICT advisers
- school managers
- researchers
- policy makers
- research sponsors
- industry.

The Network provides them with an opportunity to:
- exchange information on current research
- develop partnerships
- discuss priorities for further investigation
- focus research on issues of importance to practitioners and policy-makers.

They can do this via:
- an email discussion list
- publications
- conferences and events.

More information on Becta's ICT Research Network can be found at: **http://www.becta.org.uk/research/ictrn/**

Alternatively, send an email to: ictrn@becta.org.uk or write to: Michael Harris, ICT Research Network, Becta, Millburn Hill Road, Science Park, Coventry CV4 7JJ.

www.becta.org.uk/research

About Becta

Becta is the Government's lead agency for information and communications technology (ICT) in education and supports UK Government, national organisations, schools and colleges in the use and development of ICT in education to raise standards, widen access, improve skills and encourage effective management.

About the ICT in Schools Programme

The ICT in Schools Programme is the Government's key initiative to stimulate and support the use of information and communications technology (ICT) to improve standards and to encourage new ways of teaching and learning. The enormous potential of ICT means that for the first time it is becoming possible for each child to be educated in a way and at a pace which suits them, recognising that each is different, with different abilities, interests and needs. The challenge over the next four years will be to successfully embed ICT in every facet of teaching and learning where it can have a direct impact on raising standards of attainment. A vision for the future of ICT in schools can be found in the paper *Fulfilling the Potential – Transforming Teaching and Learning through ICT in Schools,* available on the DfES ICT in Schools website **http://www.dfes.gov.uk/ictinschools/publications/**

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