

ImpaCT2

Learning at Home and School: Case Studies

Summary

ImpaCT2 is one of a number of projects commissioned by the Department for Education and Skills (DfES) and managed by Becta with the aim of evaluating the progress of the ICT in Schools Programme. This summary reports primarily on the outcomes of Strand 3.

Summary of key findings from this strand

Strand 3 is an independent evaluation of the impact of networked technologies on learning and teaching carried out by staff at the School of Education, University of Leicester. Working in 15 of the 60 schools selected for strands 1 and 2, this project focused on: learning and teaching environments; learning and teaching styles; and the impact of networked technologies on the perceptions of teachers, managers, pupils and parents. The study team worked with teachers, pupils and others associated with Years 6, 9 and 11.

The overarching aim of this strand was to establish qualitative evidence that could add to that uncovered in strands 1 and 2. In a series of linked case studies, a range of research methods were employed (including observations, interviews, video diaries and group activities) to explore the perceptions and understandings of the users of networked technologies in relation to issues of teaching and learning. The study team thus attempted to give a voice to those involved in teaching and learning with, and through, networked technologies and to present a 'view from the inside'.

The key findings from this strand of the study include:

- Networked technologies are fast becoming a feature of pupils' education, and whilst valued by teachers as an educational tool, strategies for their effective use are still developing.
- Sustainability and improvement of ICT provision are key issues. As many pupils have access to superior hardware and software at home, there are concerns that demand for ICT provision is outstripping what schools can afford to supply. Additionally, shortages of space, funding and technical expertise are key factors restricting schools' ability to maintain and develop suitable systems.
- ICT suites and intranets are now almost standard, and are frequently augmented by clusters and stand-alone machines in various parts of the school. There are educational advantages and limitations with all such strategies, but a particular need for staff to have access to machines for preparation and professional development is recognised.
- Home use of technologies is developing, but issues such as equality of home access, lack of clear guidance from schools, and pupils' ability to evaluate resources all have an impact in this area. As home computers are frequently more advanced than those available in the school environment, pupils are engaging in innovative use of the technology, which will need to be acknowledged by schools as they develop their own practice.

Summary of key recommendations from this strand

A total of 18 recommendations have been made as a result of this study, in key areas of training, guidance and support; ICT provision and support; and development and dissemination of good practice. These are detailed in full in the report on which this summary is based, but in summary are:

Training, guidance and support

- Whilst training to date has undoubtedly benefited teachers, there is a continuing need for training which can move beyond technical competence and concentrate on the appropriate application of networked ICT into the curriculum, along with development of transferable skills such as search and evaluation strategies for both teachers and pupils. Additionally, there is a need for specific guidance regarding the potential of ICT in the areas of Numeracy, Literacy and special educational needs (SEN), and more regard needs to be taken of the impact that ICT use in primary schools is having on secondary schools. There are clear opportunities for developing greater links between ways in which ICT is used in schools and the home environment.

ICT provision and support

- Dedicated staff machines and time should be made available to allow staff the opportunity for professional development and teaching preparation, and hardware and software need to be reliable, well-maintained and up-to-date in order to keep both staff and pupils motivated and effective.

Development and dissemination of good practice

- There is recognition among teachers that a more flexible approach is required if ICT is to be effective. Changes in lesson style to allow a less formal classroom atmosphere, greater pupil autonomy, differing modes of teacher/pupil interaction, and flexible study space are all recognised as key success factors for effective use of ICT. Further good practice should also be developed in facilitating greater links between home and school use of ICT.

Background

ImpaCT2 is one of a number of projects commissioned by the Department for Education and Skills (DfES) and managed by Becta with the aim of evaluating the progress of 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.

ImpaCT2 is a major study carried out between 1999 and 2002 involving 60 schools in England and was designed to:

- Identify the impact of networked technologies on the school and out of school environment
- Find out the degree to which these networked technologies affect the educational attainments of pupils at Key Stages 2, 3 and 4.

The study involved three related strands:

- Strand 1: to develop and apply appropriate methods for evaluating the use of ICT in school and out of school, and to analyse the statistical relationship between the effective implementation of ICT and standards of performance in National Tests and GCSEs.
- Strand 2: to develop and apply a variety of methods to establish how pupils use ICT, in particular out of school, and what is gained from such use.
- Strand 3: to explore the nature of teaching and learning involving ICT in various settings, with a focus on the views of pupils, teachers, and parents.

The ImpaCT2 study was jointly carried out by a team of researchers from the University of Nottingham, the Open University, Manchester Metropolitan University and the University of Leicester, and led by Professor Colin Harrison at the University of Nottingham.

This summary reports primarily on the key findings from Strand 3 of the study.

The approach taken in Strand 3

In recent years there has been a growing emphasis on the use of technology in educational contexts. The National Grid for Learning (NGfL) programme – now the ICT in Schools programme – has increased dramatically the provision of ICT resources in school and training for teachers. Meanwhile the rapid development of communications technologies such as e-mail and the World Wide Web is reflected by the fact that the 'C' in 'ICT' is now used throughout the recently revised National Curriculum documentation, signalling the continuing shift away from the notion of 'computing' as a completely discrete domain of study, towards seeing ICT as a range of powerful resources which will play an increasingly central role in all areas and phases of study.

The extent to which these changes have affected the way that teachers teach and learners learn is at the heart of this case study evaluation. By seeking the views of school managers, curriculum coordinators, classroom teachers, pupils and parents, and by observing the use of ICT in practice, the evaluation team have sought to answer a number of key questions about the current and possible future place in our schools of ICT in general, and networked technologies in particular.

15 of the 60 schools selected for strands 1 and 2 had a series of visits from the case study team, organised in three phases over a period of two school terms. The case study schools participated in a range of research activities designed to explore the research issues at three main levels: at the institutional level of specific schools; at the classroom level in terms of teaching and learning; and at the individual level of teachers, managers, pupils and other stakeholders.

The study team followed a stratified random selection procedure to identify a total of seven primary schools, seven secondary schools and one special school, representing as far as possible an even distribution of 'Average' ICT use and 'High' ICT use schools across the country (using criteria developed by the strand 1 team).

The case studies therefore explore:

- Teachers' attitudes towards and definitions of the effectiveness of ICT training programmes
- Teachers' perceptions of the impact of networked technologies on their teaching style
- The range of actual teaching styles deployed when using ICT
- Pupils' perceptions of the impact of networked technologies on their learning
- Pupils' and teachers' perceptions of the impact of networked technologies on pupil attainment
- Pupils' and teachers' understanding of the value of using networked technologies in terms of wider benefits than attainment
- The impact of collaboration between pupils and between teachers and pupils on styles of learning in the ICT environment
- Pupils' and teachers' accounts of the relationship between home and school use of networked technologies
- The impact of out-of-school and in-school use and experience of networked technologies on attainment.

In analysing the results of the various measures employed, certain themes emerged from the concerns expressed by teachers, pupils, managers and parents that formed a natural framework for detailing the findings. These main themes constitute the substantial sections of the evaluation:

- ICT in schools: practice and perceptions
- Management and organisation of ICT
- Technology and infrastructure
- Training and professional development
- Home and school use of ICT.

Further findings

Research in this strand of the ImpaCT2 study was conducted under five key areas. These are identified below, with some further key findings:

ICT in schools: practice and perceptions

- The introduction of networked ICT into schools in recent years through the NGfL, and the provision of training, support and resources, have all been recognised by teachers as inevitable and valuable, but problematic. Relatively few teachers in the sample offered direct evidence of ICT's impact on attainment, preferring instead to concentrate on its positive effects on behaviour, motivation, communication and process skills, and that it enables pupils to learn more autonomously.
- Networked technologies (particularly the World Wide Web) are fast-becoming a regular feature of pupils' education (at home and school) and are valued for the range of resources to which they can provide access. But strategies for their effective use are still developing. Teachers and pupils are clear about the potential of ICT, but not always able to articulate what is being learnt as a result of its use.
- Some of the best examples of the use of ICT were observed where the lesson moved through different modes of teacher/pupil interaction, which involved both in a variety of roles, and where intended and actual use came together.
- Access to a computer at home is thought to be more important than factors such as age or gender, and (relative to other core skills), even very young pupils now arrive at school with a fairly high level of computer competence.
- Teachers singled out children with SEN as among those who were especially likely to benefit from access to ICT. There was however a general lack of awareness or knowledge among special educational needs co-ordinators (Sencos) concerning the potential of ICT for these pupils, either in terms of its general use, or regarding more specific programmes or equipment which might assist in meeting individual needs.

The management and organisation of ICT

- It is important to recognise how far the case study schools have come down the road of using networked technologies efficiently. However teachers and managers are concerned with the sustainability and improvement of ICT provision along a number of dimensions, including the 'ICT deficit' compared to many of their pupils' access to superior hardware and software at home. Despite innovative ways of meeting pupil and teacher needs in ICT, demand was felt to be outstripping what schools could afford to supply.
- The problem of recruiting, training and retaining ICT competent staff was seen as an impediment to sustaining and maintaining facilities in a robust and curriculum effective state.
- Managers and teachers perceived ICT provision as inadequate to meet the demands for ICT-discrete sessions and the use of networked technologies for specific curriculum purposes, with subject work using ICT mainly losing out.
- Most of the case study schools had developed policies on filtering and acceptable use, which attempted to strike a balance between

freedom and restriction. While there were still some schools with genuine differences of opinion between key stakeholders, it was usual to address these issues on educational, rather than technical or moral terms.

Technology and infrastructure

- ICT suites and intranets are now almost standard, and are frequently augmented by clusters and stand-alone machines in various parts of the school. There are educational advantages and limitations of all such strategies, but a particular need for staff to have access to machines for preparation and professional development.
- System reliability and technical support are still key issues, especially for primary schools. Technical failure is both frustrating and de-motivating for staff and pupils.
- Shortages of space, funding, and technical expertise are restricting schools' ability to maintain and develop suitable systems.

Training and professional development

- All schools in the sample have undertaken and benefited from a range of formal and informal training activities. The quality of much of the formal training, however, has been highly variable.
- Teachers believe that it is too soon to say if NOF is having an impact on attainment. They report that it is improving teachers' technical confidence and competence, but they now wish to develop their ability to integrate ICT into the curriculum.
- There were general concerns about the amount of (frequently unpaid) time it was taking to undertake the training, and requests that funding be provided for such time, as well as for the purchase of training materials.
- In addition the evaluators identified a need for further training in issues such as: developing transferable skills; search and evaluation strategies; accommodating children with different levels of ICT capability; and the uses of ICT in and out of school.

Home and school use of ICT

- While there are examples of good practice in some areas, the use of e-mail to bridge the home and school environments is still under-exploited.
- Home use of the Internet is supporting and enhancing the schoolwork of many pupils, but teachers also have concerns about the nature and quality of some of the resources pupils find by themselves.
- Teachers tend to encourage, rather than require pupils to use the Internet for homework, largely because not all children will have equal access at home.
- There is frequently a lack of clear guidance from schools for parents who do, by and large, want to support their children in using ICT effectively at home.
- Home computers, however, are frequently more advanced than those at school, and pupils are engaging in more innovative uses of new technologies in their own time – uses which schools may need to acknowledge as they develop their own practice.

Recommendations

Some key recommendations emerging from this strand of the study are:

Training, guidance and support

- The study team would endorse current calls for a comprehensive review of the New Opportunities Fund (NOF) training model and its replacement/augmentation. Such a review should focus on providing differentiated training programmes for staff with varied levels of competence and confidence, and should consider the best way of providing nationwide consistency.
- There is continuing need (despite NOF) for training that can move beyond technical competence and concentrate on the appropriate application of networked ICT into the curriculum. Teachers still need advice on how to develop the effective use of networked technologies in their teaching, and how to integrate it fully into learning activities.
- More regard needs to be taken of the impact that NGfL and other ICT initiatives in primary schools are having for secondary schools now that some (but not all) Year 6 pupils are transferring with higher levels of ability in some (but not all) areas of ICT activity. Secondary schools may also need to examine procedures for catering for pupils with widely differentiated needs.
- Specific guidance may need to be developed on the potential of ICT in the Numeracy and Literacy Hours.
- Specific guidance may also need to be developed for teachers using ICT to support pupils with SEN.
- There is a need for teachers to be trained in the development of transferable skills with their pupils, and in the improved use of search and evaluation strategies.
- The evaluation team believe that schools and homes have more to learn from each other about the ways in which ICT is being used in each context. For example, teachers could be encouraged to share knowledge of educational software and modes of learning with parents in order to increase pupils' skill, knowledge and understanding. On the other hand schools could usefully examine the ways in which ICT is being used in other contexts and whether these have any potential in the school environment.

ICT provision and support

- Dedicated staff machines and time should be made available to allow staff the opportunity for professional development and teaching preparation. Central funding may be required to ensure that this occurs equitably across all schools.
- Hardware and software need to be reliable, well maintained and up-to-date in order to keep staff and pupils motivated and effective.
- Adequate technical support needs to be funded and provided in schools. In some cases this may involve schools in sharing personnel and expertise.
- It is essential that bandwidth is improved to allow for more efficient use of the ICT time that classes have available to them. This is particularly important where access to ICT facilities is limited because of timetabling arrangements.
- Schools need to ensure that procedures are in place to detect and deal with viruses so that home-school links can be exploited to the benefit of pupils' achievement.

Dissemination and development of good practice

- In the best examples of ICT use, lessons move through different modes of teacher/pupil interaction and involve both in a variety of roles.

- Working with computers often engenders a less formal classroom atmosphere and facilitates more pupil autonomy. This remains a challenge for some teachers.
- Even in well-structured lessons, it is not always possible for the teacher to determine the extent to which the pupils are actually learning or engaged in the task in hand.
- There are advantages to the development of safe and reliable e-mail systems that allow pupils to send work between home and school. Staff can also make good use of this facility.
- In order to exploit the potential of ICT, schools should be seeking to support learners in interrogating information in a variety of ways. The fact that ICT can aid presentation, for example, was mentioned by several teachers and while this was sometimes linked to motivation, self-esteem or higher-order thinking, many cited this as a positive end itself, or at least the wider benefits were not articulated.
- Classrooms containing ICT (including dedicated ICT suites) benefit from layouts that are flexible, which allow for non-computer work, free movement of pupils and teachers, plenary sessions, and clear supervision of work.

Conclusion

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. Schools have come a long way in recent years but are still at different stages of integrating ICT into everyday practice. Many are well down this road, others less so whilst still making progress. Meanwhile, the educational potential and the accessibility of new technologies in schools and at home continue to grow.

Since 1998, when the Government published its proposals to develop a National Grid for Learning (NGfL)¹, schools and other institutions have made considerable progress in their use of ICT to support teaching and learning and to improve the efficiency of school management.

The intervening period has also witnessed significant advances in the range of technologies and applications available to the education and home markets and in the growth of access to ICT outside school. There is every sign that these trends are set to continue.

This progress reflects tremendous vision, initiative and commitment at all levels of the education sector and has been achieved within the context of the programme. However, while progress towards these goals has been significant and can rightly be celebrated, it is only the beginning of an ongoing transformation that over time will deliver exciting new opportunities for individuals to personalise their learning and realise their potential in school, at home and in the community. These opportunities will become a reality as ICT becomes firmly embedded in all aspects of school life rather than an 'optional extra'.

A vision for the future of ICT in schools is provided in the paper *Transforming the Way We Learn*², available at: www.dfes.gov.uk/ictfutures.

Further information

The summary, the full report on which this summary is based, the earlier Interim Findings and the Preliminary Reports, are available on the Becta Research web site at: www.becta.org.uk/research/impact2

A full report of the ImpaCT2 findings (including a more detailed description of the research methods employed), is forthcoming, and will also be published on the Becta Research web site.

Other reports in the ICT in Schools Research and Evaluation series are also available on the Becta Research web site.

¹ Open for Learning, Open for Business – the NGfL Challenge (DfEE, 1998).

² Transforming the Way We Learn (DfES, 2002: www.dfes.gov.uk/ictfutures).