# ImpaCT2

## Pupils' and Teachers' Perceptions of ICT in the Home, School and Community

## Summary

ImpaCT2 is one of a number of projects commissioned by the Department for Education and Skills 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 2.

### Summary of key findings from this strand

Strand 2 explored the wider context of pupils' informal learning with information and communications technology (ICT) at home, in other out-of-school venues, and in school outside formal lessons. 'Informal learning' refers to the acquisition and development of skills, knowledge or conceptual understanding in ways and locations that differ from the traditional classroom situations and methods. The study employed innovative methods to obtain evidence of pupils' learning about ICT, and with ICT. By collecting evidence from pupils about their understanding of the role of computers in today's world, how they used them, where, when, how frequently and for what purposes, the study team aimed to develop explanatory theories which would be of practical value for teachers and policy makers.

The key findings from this strand of the study:

- For most pupils the amount of time spent on ICT at home greatly exceeds the time spent on ICT at school. Pupils perceive that they have greater autonomy to explore ICT at home and the opportunity to use it for longer periods of time.

- Many pupils have sustained access to powerful ICT equipment and resources at home to support a wide variety of leisure pursuits. They are discriminating in use of the Internet, which is enabling them to develop skills and literacies in networked ICT, confidence in its use, and a range of on-line social and communication skills.

- Home ownership of computers and home access to the Internet are increasing. However, at the time of carrying out the study, over a quarter of pupils did not have access to the Internet at home. Access to ICT (in public libraries, Internet cafés and on school premises outside lesson time) lacks flexibility and in some cases is expensive, so that pupils without access at home are seriously disadvantaged.

- Pupils are aware of the moral and ethical debates surrounding the use of networked technologies and the perceived security risks. They are interested in discussing these issues and the majority use the Internet with discrimination as well as enjoyment.

- Pupils have an extensive awareness of the role of computers in today's world. Awareness varies between individuals but many are knowledgeable about a wide range of equipment and how it is used, as well as the varied purposes of its use by all kinds of people in many different locations. This has implications for the speed and ease with which they are likely to become skilled in using networked ICT: they may develop skills in using networked ICT more quickly and easily than is often anticipated by schools and teachers.

- At all three key stages included in the study there is a significant and positive relationship between the levels of awareness held by pupils of computers in today's world and whether they had home access to the Internet and their own personal e-mail address.

- There is also a significant and positive relationship at all three key stages between these levels of awareness and pupils' experience of surfing the Internet.

- Pupils' perceptions of what learning is are shaped by their experience in school settings. They associate 'learning' with school-related use and typically describe all ICT use at home as 'games'. When the meaning of 'games' is probed, it is clear that much learning is taking place through their use of ICT for leisure pursuits, including learning of factual knowledge and conceptual understanding.

- The arrival of networked ICT placed great demands on schools and teachers and it is taking time to embed it in teaching and learning practices. In the schools involved in the study, implementation of this innovation has progressed in three stages: during stage one the main focus is on the provision of equipment infrastructure and support; stage two focuses on teaching ICT skills, often in specialist ICT lessons; stage three moves to the integration of ICT with curriculum subjects, including numeracy and literacy. During the time of collecting the Strand 2 data, schools moved from stage one to stage two and only a few teachers in a few schools began to move to stage three.

## Summary of key recommendations from this strand

These recommendations are based upon the key findings above:

- Since pupils are likely to acquire ICT skills quickly and easily through using them for self-directed tasks, more time should be spent on exploratory learning in curriculum subjects and less time on teaching skills in discrete ICT lessons. Check-lists and self-test programs could be used as a back-up to allow pupils to demonstrate their self-taught skills, perhaps with certification.

- Schools need to develop strategies for 'bridging the gap' for those pupils who do not have access to ICT resources, including the Internet, at home. This might be through loans, government grants, or 'thin client' access from home to the school computer servers. ('Thin client' technology enables less powerful models of computers to act as terminals as part of a more powerful network, so older and cheaper computers could be purchased which would still enable pupils to use the most powerful programs from home.)

- Parents need to be made more aware of the importance of home access to ICT and the learning that results from leisure use, including some of the stimulating activities that younger pupils categorise under the broad heading of 'games'.

- Teachers and governors need to consider how to build on their pupils' experience, developing skills and enthusiasm in relation to networked ICT. They could make much better use of this potential resource through a more creative approach to homework and self-directed projects.

- Schools and teachers need continuing support, including more funding for equipment which can be used flexibly, access to at least one technician on the premises, and more training for teachers in how to integrate ICT with subject learning. This will ensure that they are able to achieve the necessary changes in school culture and teaching practices to reap the benefits of the Government's investment.

## Background

ImpaCT2 is one of a number of projects commissioned by the Department for Education and Skills 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 2 of the study.

## The approach taken in Strand 2

ImpaCT2 research was carried out at the time when the Internet was just beginning to be widely used in UK homes. It was important to understand the impact this was having on pupils outside school. One method of doing this was to ask the pupils to draw 'concept maps'. Concept mapping is a system for presenting ideas in a diagram. Pupils were asked to draw objects and link them with lines to show the connections between them. As a whole, the maps provided a measure of the complexity of each pupil's awareness of computers in their world; those with more images and links are more likely to have a broader understanding of the role of computer technology in our society.

The results are not only interesting; they can be of practical value. We know from recent research on learning that how learners think about a tool (such as ICT) affects their ability to acquire the skills to use that tool effectively. That is, models of thinking about a tool and the skills necessary to use it develop in tandem. This being the case, teachers might benefit from understanding in more depth the relationship between the models of thinking about ICT held by their pupils and how they acquire ICT skills.

## Two examples of the concept maps

The concept map opposite (Figure 1) is an example of a pupil illustrating an awareness of the use of ICT for information and communication between people.

An example of a map where the pupil's vision was clearly focused on *where* ICT is used is shown in Figure 2.

Further analysis of these and other concepts maps is included in the report on which this summary is based.

One of the statistical analyses undertaken by the study team was to look at the concept maps in relation to the pupil questionnaire data also collected as part of the study.[1] This enabled the study team to examine the possibility of a relationship between pupils' conceptions of ICT and individual access to and experience of ICT outside school.

[1] See *ImpaCT2 – The Impact of Information and Communication Technologies on Pupil Learning and Attainment* (Becta, Coventry: 2002: www.becta.org.uk/research/impaCT2).

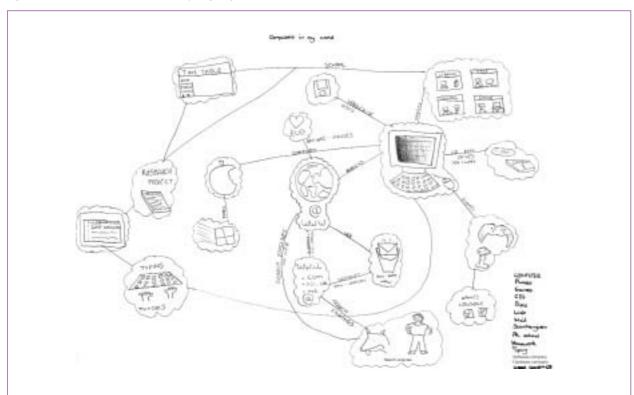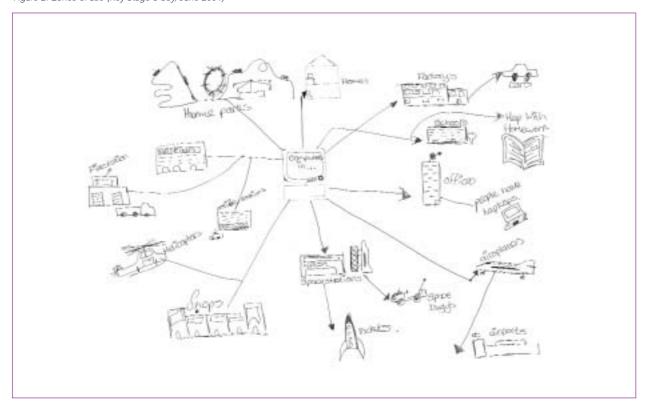*Figure 1: Information and communication (Key Stage 2 girl, June 2000)*



*Figure 2: Zones of use (Key Stage 3 boy, June 2001)*

- Significant positive relationships were found at all three key stages between pupils who drew complex concept maps and those who had home access to the Internet and their own personal e-mail address.

- Significant positive relationships were also found at all three key stages between pupils who drew complex concept maps and experience of surfing the Internet.

- However, there was no pattern of significant relationships between complex concept maps and those aspects of ICT ownership and use that are not directly related to the Internet (for example, games console ownership, mobile phone ownership, games playing, word processing and desk-top publishing).

These results are not proof of any causal link between the level of awareness of computers in today's world and ownership and experience of using ICT, but it would seem that they are connected in some way. The concept maps show that many pupils have the kinds of conceptions of ICT that are needed to imagine and plan creative ways of using networked ICT. This strongly suggests that they are ready to acquire skills in the use of ICT easily and quickly and use it in self-directed ways for a wide range of purposes. This has important implications for the use of ICT in schools. In particular, it suggests that the emphasis on teaching ICT skills rather than integrating the use of ICT in subject learning is unlikely to make the best use of expensive resources.

## Conclusion

The picture clearly emerging from this data is of the potential of ICT to be used with more vision in the school curriculum.

Since 1998, when the Government published its proposals to develop a National Grid for Learning (NGfL)[2], 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. 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.

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. This has been accompanied by unprecedented levels of Government investment and is underpinned by five challenging targets.

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*[3].

## Further information

This summary, and the full report on which this summary is based, is 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), reports from the other strands of the study, the earlier Interim Findings and the Preliminary Reports, are also 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.

[2] *Open for Learning, Open for Business – the NGfL Challenge* (DfEE, 1998).

[3] *Transforming the Way We Learn* (DfES, 2002: www.dfes.gov.uk/ictfutures).