



AN EVALUATION BY THE EDUCATION
& TRAINING INSPECTORATE

of Information
& Communication Technology
IN POST-PRIMARY SCHOOLS
2001 - 2002

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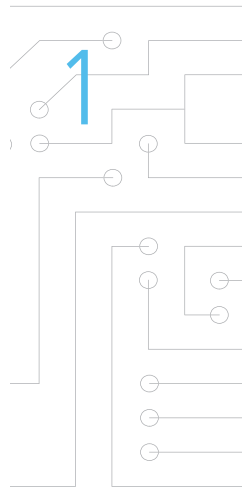
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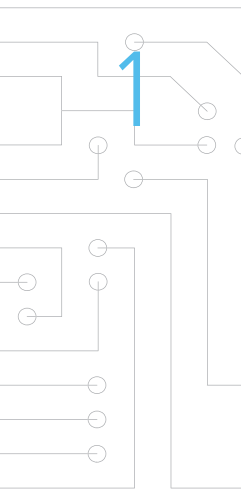
MAIN REPORT

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1. INTRODUCTION

- 1.1 The report summarises the findings of an inspection of the influence of information and communication technology (ICT) in supporting and enhancing teaching and learning in post-primary schools in Northern Ireland (NI). The inspection was undertaken by the Education and Training Inspectorate (Inspectorate) during March 2002. The objectives of the inspection were to evaluate:
- i. the quality of teaching and learning using ICT;
 - ii. the quality of planning for the development of ICT across the school; and
 - iii. the quality of resources available to support the development of the pupils' ICT competence.
- 1.2 This is an important time for the development of ICT in NI schools. The Government is investing considerable funds to improve the ICT infrastructure and resources in schools. In addition, the range of technologies and applications available to young people is advancing rapidly and there has been a significant growth in access to ICT outside school, mainly in the home. Young people are becoming increasingly familiar with, and competent in using, digital technologies, and they have high expectations of what they can achieve using ICT.
- 1.3 In September 1997, a comprehensive Strategy for Education Technology in NI was launched. Although parts of the strategy are still at an early stage of implementation, this initiative is resulting in significant investment in ICT in schools. The main aim of the strategy is to equip young people with the ICT competence they need for the emerging knowledge-based society. A second and parallel aim is to ensure that teachers undertake professional development in the appropriate use of ICT to support and strengthen teaching and learning. The implementation of the Strategy for Education Technology in NI is in progress; the main strands are:
- the 'Connecting Teachers' initiative which has resulted in the distribution of around 12,000 laptops and 1,000 data projectors to schools;
 - the establishment of the Northern Ireland Network for Education (NINE) website as the NI node of the National Grid for Learning (NGfL);
 - the procurement and delivery of Classroom 2000 (C2k), a managed ICT service to schools, which is now underway; through C2k, all participating schools will be supplied with networked computers, a broad range of good quality educational software content, and connection to a range of on-line services such as the Internet and e-mail; the installation, maintenance and sustainability of the service are undertaken by specialist providers, organised through a public and private sector partnership initiative;





as part of C2k, all post-primary schools have been supplied with a 2 Mbps broadband connection to the Internet;

- the provision of the New Opportunities Fund (NOF) ICT training programme for teachers and librarians; over 99% of NI schools have signed up to undertake NOF training; the completion date for this training is March 2003;
- the review of the position of ICT in the NI curriculum (NIC) and the potential use of ICT in on-line assessment.

1.4 Progress in the implementation of the various strands of the Strategy for Education Technology has been uneven. At the time of the inspection, the C2k managed service solution had been installed in around 13% of all primary schools, but in no post-primary schools.

1.5 This report is intended to establish a baseline for future work by the Inspectorate as the strategy is implemented more fully; its findings are based on evidence from the inspection of a sample of 18 post-primary schools (see Appendix 1). The inspectors visited 216 lessons across key stage (KS) 3 and KS4. Discussions were held with principals, members of the senior management team, ICT co-ordinators, heads of department, teachers and pupils. In addition, inspectors examined samples of pupils' work, school development plans and other relevant curriculum documentation; they also identified a range of examples of good practice in the effective use of ICT in teaching and learning, and a sample of these has been included in the report.

1.6 Prior to the inspection, the senior managers of all schools were asked to complete a self-evaluation questionnaire in order to provide the Inspectorate with important background information and an overview of ICT in primary and post-primary schools. A high return rate of 82% was recorded, and the Inspectorate appreciates the helpful contribution which the schools made to the database on which the inspection could draw.

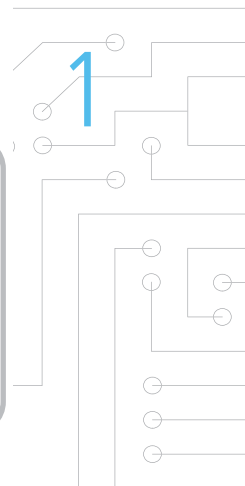
1.7 A number of quantitative terms are used in the report when commenting on aspects of provision for ICT. These terms should be interpreted as follows:

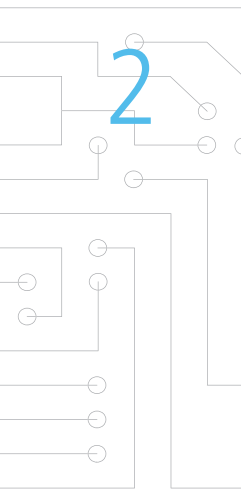
Almost/nearly all	more than 90%
Most	75% - 90%
A majority	50% - 74%
A significant minority	30% - 49%
A minority	10% - 29%
Very few/a small number	less than 10%

- 1.8 In assessing the various features of the provision for ICT, inspectors relate their judgements to four performance levels which may be interpreted as follows:

Grade

- | | | |
|----|-------------------------------|--------------------------------|
| 1. | Significant strengths | good (ranging to outstanding) |
| 2. | Strengths outweigh weaknesses | satisfactory (ranging to good) |
| 3. | Weaknesses outweigh strengths | fair (ranging to satisfactory) |
| 4. | Significant weaknesses | poor |

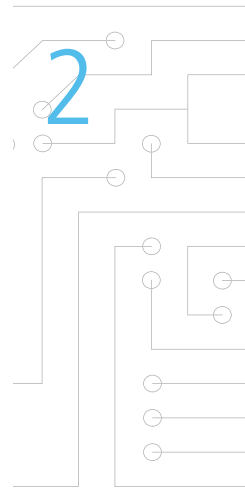




2. SUMMARY OF MAIN FINDINGS

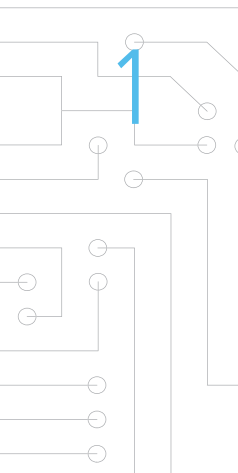
- 2.1 A majority of schools have identified ICT as a key priority and the level of strategic planning for ICT is good. In these schools, the school development plan is focused appropriately on improving the quality of teaching and learning using ICT and the standards of achievement in the pupils' work.
- 2.2 In just over one-half of the schools, there are weaknesses in subject planning for the integration of ICT to support learning. There is a need for most schools to promote a consistent approach to the development of ICT within and across subjects, and to ensure appropriate progression in ICT skills for all the pupils.
- 2.3 The quality of teaching using ICT was satisfactory or better in just over three-quarters of the lessons inspected. In most of the lessons, the pupils displayed consistently high levels of interest and enjoyment in ICT-related activities.
- 2.4 There is an increasing use of ICT to enhance whole-class teaching.
- 2.5 Most schools provide timetabled discrete ICT lessons to pupils in years 8 to 10. In the better practice, the work in the discrete lessons is integrated well into subject work and the pupils have opportunities to undertake problem-solving activities in appropriate contexts.
- 2.6 In most schools, there is a need to develop further the assessment and recording of ICT achievements within and across subjects. In the majority of schools, insufficient account is taken of the pupils' prior experiences with ICT on entry to year 8.
- 2.7 Although most pupils are developing sound basic ICT skills, there are relatively few examples of the creative use of ICT by pupils at KS3 or KS4.
- 2.8 While most pupils have good Internet search skills, there is insufficient emphasis on the further development of the pupils' information-handling skills, including analysing, evaluating and refining the information retrieved.
- 2.9 There is a need for a more coherent approach to the use of ICT to support pupils with special educational needs and to enhance work in literacy and numeracy.
- 2.10 ICT leadership is good in the majority of schools.
- 2.11 The NOF ICT training has been successful in raising the profile of ICT within schools and in enthusing many teachers. While NOF training has improved the personal ICT competence of teachers, only a minority of teachers have incorporated successfully ICT to support and enhance subject-work. For the majority of teachers, further professional development is required to strengthen the use of ICT in the classroom.

- 2.12 In the majority of schools, there are wide variations and inconsistencies across subject departments in the level of support provided by the Curriculum Advisory and Support Services (CASS) of the Education and Library Boards. To sustain the momentum of ICT training and ensure maximum impact from the C2k managed service, there is a need for CASS to provide teachers with post-NOF training and support.
- 2.13 The accommodation and resources for ICT are satisfactory or better in the majority of the schools inspected. However, the subject teachers in over one-half of the schools face significant constraints in gaining regular access to ICT resources.
- 2.14 In the minority of schools where ICT resources are very good, the effective and flexible deployment of resources, often in subject-based clusters of computers, provides high levels of access for teachers and pupils.
- 2.15 Approximately one-half of the computer stock in schools comprises modern high specification multimedia computers. Just under two-thirds of the computers in schools are networked and only one-half are connected to the Internet.
- 2.16 The quality of computer suite accommodation varies considerably across and within schools.
- 2.17 Almost two-thirds of teachers have laptop computers; these are used well for lesson planning and preparation, and in some instances, to support effectively whole-class teaching.
- 2.18 The implementation of the various strands of the Strategy for Education Technology is uneven, in particular where the NOF training is not being matched by improved access to ICT hardware and software. In the majority of schools, the impact of NOF training is diminished as a result of the limited access to ICT resources for specialist subject teachers.



MAIN REPORT

1. PLANNING FOR LEARNING WITH ICT

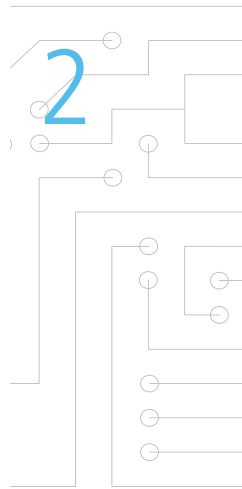
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- 1.1 There is wide variation in the quality of planning for the integration of ICT to support teaching and learning. The quality of teachers' planning for ICT is good to excellent in 11% of the schools and satisfactory in 34%. In the remaining schools, weaknesses in planning for ICT outweigh the strengths.
 - 1.2 In the majority of schools, the contribution of individual subjects to consolidate and extend the pupils' competences in ICT is under-exploited. There is inconsistency in the range, challenge and frequency of opportunities provided for the pupils to learn and apply ICT skills. Few schools plan well for the integration of ICT into subject work at KS4. In the majority of schools, insufficient account is taken of pupils' prior knowledge and skills in the use of ICT. Only a minority of schools plan effectively to consolidate and build on pupils' ICT knowledge and competence developed during KS2 and on home computers. Effective planning and practice in the integration of ICT to support learning often result from the initiative and expertise of individual teachers rather than whole-department or whole-school strategies.
 - 1.3 In a significant minority of schools, there is effective planning for the development of ICT at KS3. There is an effective whole-school policy which provides comprehensive guidance on the place of ICT in the curriculum and takes account of appropriate progression in the pupils' use of ICT. In addition, subject planning focuses appropriately on the contribution of ICT to the intended learning outcomes. In these schools, the teachers identify an appropriate range of software applications and incorporate effectively ICT into lesson planning. The common strengths of the schools which plan well for ICT include a commitment to the development of ICT across the whole school, the progressive integration of ICT into subject schemes of work and a proactive, cohesive team which meets regularly to co-ordinate progress. Planning for ICT is more effective when the ICT co-ordinator has a well-defined remit and an appropriate time allocation.
 - 1.4 The majority of teachers make effective use of ICT to improve lesson planning and preparation. They use ICT to improve and enhance the production and presentation of resources to support learning. An increasing number of teachers make good use of Internet resources which are modified appropriately to meet the needs of the pupils.

2. TEACHING AND LEARNING

- 2.1 The quality of teaching was good to excellent in around one-quarter of the lessons inspected and satisfactory in just over one-half. In the remaining lessons, weaknesses outweighed strengths with poor teaching observed in only 2% of the lessons. There are considerable differences among and within schools in the quality of teaching where ICT is used. Although the majority of teachers have a generally good level of personal competence in the use of ICT, only a minority use ICT purposefully to enhance learning in subject work.
- 2.2 In the most effective lessons, the teachers plan well for the integration of ICT and make good use of the time available. They outline brief and realistic learning outcomes at the start of the lesson and maintain these as a focus as the lesson progresses. The lessons are conducted at a brisk pace and achieve an appropriate balance between the use of ICT and activities away from the computers, when the pupils plan, reflect on and evaluate their work. Skilful questioning and intervention by the teachers are used to check the pupils' understanding and extend their thinking. The teachers set tasks which are both challenging and matched closely to the pupils' interests and experiences. In the better lessons, there is a clear purpose to using ICT and it enriches the lesson outcomes.

In a year 11 GCSE English literature lesson, the pupils were studying a Steinbeck novel. During this lesson they focused on the context in which the novel is set, including the American Depression, California as a symbol of the American Dream and the author's background. As part of a sequence of lessons, close reading of the first section of the novel was followed by discussion and analysis of language and the writer's craft. The pupils were divided into groups: two groups designed a poster reflecting the writer's concerns in the first section of the novel and supported this with commentary and analysis. These pupils were given relevant website addresses and they searched for, evaluated and selected appropriate images for the poster. The two other groups, again using the Internet, searched for, evaluated and selected information on Steinbeck's background and the American Depression. They presented this to the rest of the class in an appropriate form. This exercise helped the pupils to develop skills of retrieval, analysis, evaluation, literary appreciation and communication. The pupils assessed one another's work using agreed success criteria and discussed the characteristics of effective presentations.

- 2.3 There are weaknesses in teaching using ICT in just over one-fifth of the lessons. These lessons are not well planned and organised and do not sufficiently challenge the pupils. The most common weaknesses include low expectations on the part of the teacher, slow pace of work and an inappropriate emphasis on the completion of discrete tasks, rather than the use





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of ICT as a tool to support work in the subject. The pupils spend too much time completing routine tasks and are often engaged in simple transcription work at the computer. In these lessons, the pupils often reproduce information from other sources with little attempt at analysis, interpretation or evaluation. Many of these lessons are characterised by over-direction, a lack of involvement by the pupils and too few opportunities for them to reflect on and evaluate their work.

- 2.4 In a minority of lessons, there is effective group and paired work when the pupils are using ICT. In these lessons, the pupils benefit from peer knowledge and expertise; they collaborate well and are encouraged to express opinions and develop ideas and they often offer and accept technical help from one another.

In a year 8 geography lesson the pupils made effective use of the Internet to investigate elements of the weather. The teacher set brief but clear learning outcomes, which were explained to the pupils at the start of the lesson. The lesson started with a whole-class discussion about the language of weather, and learning was consolidated through effective questioning. The teacher used a laptop computer connected to a data projector to give the whole class a brief demonstration of the website to be used for the investigation. The pupils then moved quickly to the cluster of computers and worked well in pairs to undertake the activities. They were able to locate the website and navigate to the pages they required. The pupils discussed their findings in pairs and recorded the outcomes. They engaged enthusiastically in the task and almost all made good progress. The teacher supported and encouraged the pupils well and intervened appropriately to keep all pupils on task. A short whole-class discussion before the end of the lesson enabled the pupils to present their findings; almost all understood clearly the different types of weather and the units of measurement. The pupils enjoyed this method of researching information and were motivated and challenged throughout the lesson. In a later lesson, the pupils used the school weather station to measure data on the types of weather over a period of time and used a spreadsheet to chart and analyse weather patterns and interpret the trends.

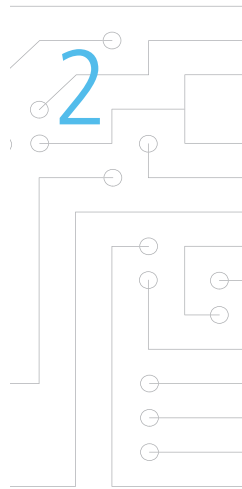
- 2.5 A number of good examples of the use of ICT to enhance whole-class teaching were noted, in particular the use of data projectors connected to computers or interactive whiteboards. In these instances, the teachers prepared good learning materials and used the technology to give clear presentations, instructions or demonstrations of, for example, websites, software functions and simulations. The pupils were responsive to the use of visual images and most interacted well with the teacher and peers. Where there was good questioning from the teacher and extended responses from the pupils, the use of this technology contributed effectively to the learning outcomes.

- 2.6 Most schools provide timetabled discrete ICT lessons to pupils in years 8 - 10. The main focus of these lessons is to develop the pupils' skills in word-processing, spreadsheet modelling, creating multimedia presentations, database design and Internet browsing. In the better practice, the work in the discrete lessons is integrated well into subject work, the pupils undertake problem-solving activities in appropriate contexts, and teachers from other subject areas are involved in planning and teaching the lessons. In a minority of schools, the pupils have good opportunities to develop and apply more advanced ICT skills, such as desktop publishing, web authoring, and the creation and manipulation of complex digital images, including animation.

In a discrete year 9 ICT lesson, the pupils undertook work for personal and social education. They worked well in four groups to research CD-ROM and web-based materials on drug awareness. The groups were required to create a multimedia presentation, although each group was allocated a different audience, namely parents, senior pupils, teachers and local politicians. As well as developing high levels of competence in the effective use of presentation software, they developed also sound literacy skills through discussions and debate on the needs of the different audiences. One of the groups complemented the presentation by creating an information leaflet using desktop publishing software.

- 2.7 In around one-half of the schools, the teaching in timetabled discrete lessons is over-directed, the tasks are too prescriptive, the pace of learning for many of the more able pupils is slow and there are too few opportunities for pupils to undertake creative work. In a few schools, subject teachers are well-informed about the content of discrete ICT lessons and the competence of pupils in a range of software applications. In these schools, this information is used well so that the pupils are provided with good opportunities to consolidate and apply their ICT skills in subject work.

In a year 11 ICT lesson, the teacher provided a clear exposition of the purpose of the lesson and ensured a high level of engagement through skilful questioning to check understanding and extend thinking. The pupils in the class were interested and involved in karting and had recently built their own go-kart. The teacher used this interest as a basis for the work, providing technical and marketing advice to a new karting company. The teacher introduced the lesson effectively using a data projector to display appropriate footage of a go-kart race. The pupils exhibited high levels of engagement and enjoyment in the lesson. There was a good balance between the use of ICT resources and work away from the computer in order to plan the advice they would give to the new company concerning their computer and marketing needs. The lesson was paced effectively and involved whole class discussion, individual and



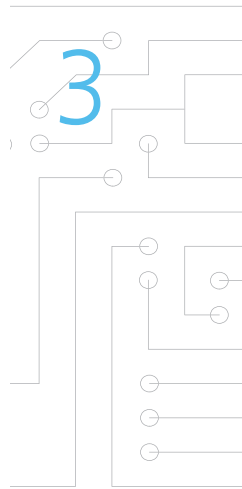
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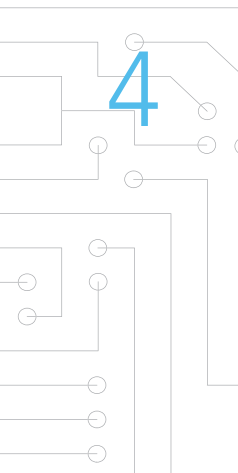
small group work. The task set was challenging and within it there were opportunities for the pupils to show flair and inventiveness, with the design of a web page. Learning was consolidated effectively by the teacher through whole class reflection on what had been discovered during the lesson.

- 2.8 In around one-third of the schools, classroom teachers benefit from good technician support. This is valued by the teachers and enhances their confidence. The technicians solve effectively any technical problems with the hardware and software and most provide assistance to teachers and pupils in an unobtrusive manner.

3. ASSESSMENT OF ICT

- 3.1 The assessment of the pupils' achievements and competence in ICT is good to excellent in around one-fifth of the schools and satisfactory in just over two-fifths. In the remaining schools, the weaknesses in assessment outweigh the strengths with poor assessment of ICT in 6% of the schools.
- 3.2 In over two-thirds of the schools, insufficient account is taken of the pupils' prior learning in, and previous experiences of, ICT on entry to year 8. As a result, in almost all of these schools there is a lack of consistency and challenge in the pupils' experiences of ICT and the more competent pupils often do not progress at an appropriate pace.
- 3.3 In a significant minority of schools, a small number of departments are monitoring, assessing, and keeping good records of the pupils' achievements in ICT. In most schools, there is a need to develop further the formative assessment of ICT within and across subjects.
- 3.4 Over 70% of the schools are registered in the CCEA Scheme of Information Technology (IT) Accreditation at KS3. The schools report that this is a useful and worthwhile means of external accreditation of the pupils' achievements in ICT at the end of KS3. The external accreditation of year 10 pupils has raised the profile of ICT in these schools and accelerated and strengthened the development of ICT within and across subjects. In most of the schools registered in the scheme, almost all of the pupils achieved accreditation in all four strands of IT competence. In the majority of schools, there is a close match between the CCEA tasks and the subject schemes of work. As a result, the CCEA tasks enable the majority of pupils undertake the ICT work in appropriate subject contexts. However, in a minority of schools, the pupils are not challenged sufficiently by the ICT work and they are capable of working at a higher level. Just under one-third of the schools have linked appropriately the CCEA scheme more directly to subject planning through the design and delivery of tasks which they have generated themselves.
- 3.5 In around one-third of the schools inspected, only a small number of departments contribute to the accreditation of pupils' ICT competence at the end of KS3. In these schools the pupils have a narrow range of ICT experiences and they have too few opportunities to use and apply ICT skills within subject contexts. Where schools are not offering the CCEA scheme of accreditation, little accurate information is available on the pupils' ICT competence and achievements at KS3.
- 3.6 At KS4, only two-fifths of the schools provide progression for pupils to specialist accredited ICT courses, mostly General Certificate of Secondary Education (GCSE) or General National Vocational Qualification (GNVQ) programmes of study. Fewer than 3% of the schools provide pupils with the opportunity to achieve a key skill qualification in information technology (IT) at level 2 or below.





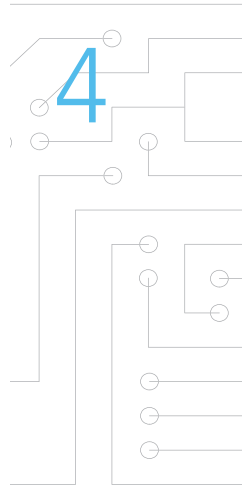
4. THE PUPILS' EXPERIENCES

- 4.1 Almost all pupils are motivated by the inclusion of ICT in subject work and are keen to participate in ICT-related activities. They are comfortable with, and show confidence and enjoyment in, using new technology. Many pupils understand the value of using ICT and have clear ideas on how ICT can be used to improve the quality of their work. In many of the lessons inspected, the pupils displayed consistently high levels of interest, enthusiasm and enjoyment in computer-based work.

In a year 10 history lesson, the pupils used a CD-ROM on the Great War and the 1916 Easter Rising to investigate various aspects of the differences in perception of the Unionist and Nationalist communities at that time. The pupils were able to deduce facts, form opinions, question evidence and empathise with the people involved in the events. The stimulus provided by the multimedia nature of the material captured effectively the interest of the pupils.

- 4.2 In almost all schools, the use of ICT to enhance subject work is improving gradually. In a significant minority of schools, the pupils have good opportunities to develop and apply broad ICT skills across a range of subjects. In the majority of schools, however, there is a lack of consistency in the range of the pupils' experiences. In these schools, the pupils' access to ICT within subjects is often erratic and they have too few opportunities to apply and consolidate their ICT skills in a sufficient range of subjects across the curriculum. There is a need for most schools to promote a consistent approach to the development of ICT within and across subjects, and to ensure appropriate progression in ICT skills for all the pupils.
- 4.3 Most pupils are developing sound basic ICT skills, including familiarisation and confidence with windows, menus, file management and the various hardware devices. They are acquiring good communication and information-handling skills. Many pupils are competent in the use of word-processing and presentation software for the display of their work. Good practice in the use of word-processing involves the pupils in drafting and amending work on screen, exploring different writing styles, being aware of the audience and purpose of the writing, and making appropriate use of graphical images. In the lessons inspected, there were many good examples of pupils presenting work well through multimedia presentation software. They enhanced the quality of this work through effective and appropriate use of the more advanced features of the software, such as animation and the use of film and sound clips. In the better lessons, the pupils presented the work to their peers and received feedback. An increasing number of pupils are producing materials and multimedia presentations of a professional standard. There is scope, however, for teachers to provide better opportunities for the pupils to engage in creative and innovative work incorporating ICT.

In a series of year 11 art and design lessons, the pupils planned, designed and created sculptured models. The pupils took a series of still digital photographs of the model, making use of a variety of creative backgrounds. They then used digital imaging software to produce animated sequences of film using the photographs. Their film-making skills developed well and they used the software effectively to edit and amend the film sequences. Many of the completed film clips were of a very high standard. The use of ICT enabled the pupils to generate quickly the animation and they were able to evaluate their work and compare and discuss outcomes with other group members. The management and organisation of the lessons were excellent. The pupils arranged themselves into working groups in order to make optimum use of the facilities. They worked independently on the individual projects and co-operated when necessary to use the equipment and facilities efficiently.



- 4.4 There is increasing evidence of Internet-based subject work in the majority of schools. In most schools, the pupils have good opportunities to research information and most teachers control access to the Internet carefully and direct the pupils to suitable and useful websites. Most pupils are competent in the basic use of search engines to find information and they can download text and images which they generally use well to improve subject work. Although use of the Internet provides the pupils with excellent opportunities to access up-to-date information or resources on a wide range of topics, only a minority of the schools equip the pupils with effective strategies to carry out refined searches, and for interpreting, evaluating, manipulating and using appropriately the information located. Few pupils use to full effect the advanced features of search engines. In around one-third of the schools, a few subject departments make good use of appropriate websites for revision purposes, mostly at GCSE level. The pupils are motivated by this form of revision work and benefit from the range of media used to present the revision topics.

In history, a group of lower achieving year 12 pupils worked on their coursework assignment on the Belfast Blitz. The pupils created multimedia presentations and prepared talks to accompany the presentation. They retrieved information from textbooks, support materials, and the Internet. They worked individually, using the BBC site, NINE and a suitable specialist history site. For example, they searched for photographs of German bombers and pasted the images into their presentations. The pupils made their own decisions about the content of the presentations. They also made appropriate choices on matters of font, text size, and inclusion of pictures. The teacher provided well-focused and suitable technical assistance to maintain the progress of the pupils' work. The teacher demonstrated to small groups of pupils how to access video clips for inclusion in the presentation where relevant. The



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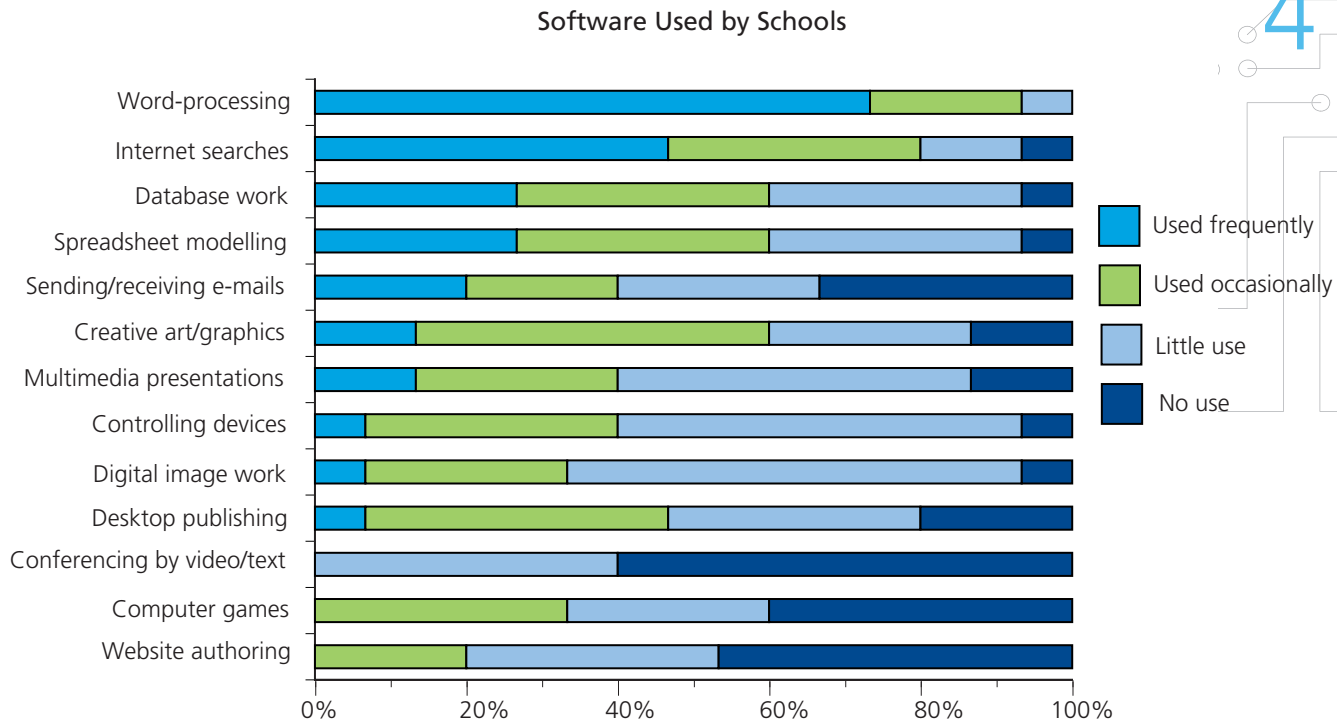
pupils worked very well, showed good concentration and considerable autonomy. The use of ICT introduced the pupils to a higher quality of history than would be possible with text resources.

- 4.5 In a few schools, ICT is used effectively to support and extend the pupils' literacy and numeracy skills and to encourage them to approach tasks and solve problems in different ways. In these schools, ICT provides a useful framework which enhances the pupils' literacy and thinking skills, either through individual interaction with the computer or through collaborative learning with peers. In most schools, however, the potential of ICT to enhance the pupils' literacy and numeracy is under used. All too often, the pupils make use of the word-processor for undemanding transcription activities rather than on-screen composition.

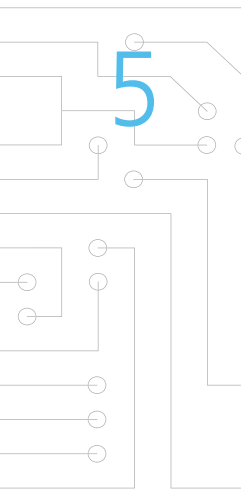
In a year 9 English lesson, the pupils accessed several newspapers on-line and they evaluated the approach and bias of particular reports. The pupils downloaded the relevant articles and minimised them on screen so that they sat side by side. They compared and contrasted the articles and the styles of writing. The discussions between the teacher and the pupils were well managed and the pupils referred to the articles to support opinions. In addition, the discussions included the relative advantages of accessing newspapers on-line.

- 4.6 There are good examples of the use of ICT in specialist ICT courses at KS4. The pupils develop a good range of ICT skills at an appropriately advanced level. They exploit the more advanced features of software application packages to design web pages and multimedia presentations, produce booklets and newsletters, create databases, and solve realistic problems using a spreadsheet. In addition, the pupils have a good knowledge and understanding of digital communications, networks and the impact of ICT on everyday life and society. The majority of the pupils apply these skills well to support work in other subjects, in particular the completion of coursework. It is inappropriate that, in a small number of schools, pupils at KS3 take accredited examinations in software applications such as text processing or computer literacy. The activities in these courses comprise mostly the repetitive transcription of textual or numeric data, involving minimal manipulation. The pupils in these courses have too few opportunities to develop and refine ideas, apply information-handling skills in appropriate contexts or to use ICT to enhance their skills in literacy and numeracy.

Figure 1



4.7 In the schools inspected, most pupils have good opportunities to use word-processing software and to undertake research using the Internet (Figure 1). Around 60% of pupils use database, spreadsheet and graphics software on a regular basis. Less than 50% of the pupils, however, send and receive e-mails regularly, or make frequent use of desktop publishing and multimedia presentation software. Only a minority of pupils create or maintain websites, and few of them experience the use of video or text conferencing.



5. MANAGEMENT AND LEADERSHIP

- 5.1 A majority of schools have identified ICT as a key priority, and the level of strategic planning for ICT is good. In these schools, the school development plan (SDP) emphasises appropriately ICT as an important area for improvement across the whole school curriculum, and a realistic action plan sets out strategies and targets for the progressive development of the pupils' ICT skills.
- 5.2 In a significant minority of schools, although ICT is a feature of the SDP, it is one of many competing priorities. In addition, the developmental work planned for ICT is limited to organisational and resource issues and does not address explicitly improvements in the quality of teaching and learning and the standards of the pupils' work.
- 5.3 Staff at senior management level promote strongly the effective integration of ICT into classroom practice in the majority of schools, and give good support to the work of the ICT co-ordinator and the core team. Just under one-half of the schools invest significant funds to provide a modern ICT infrastructure, including computers distributed in clusters to subject departments. In addition, extra financial support is provided for staff training, staff time, substitute cover, and the use of outside agencies.

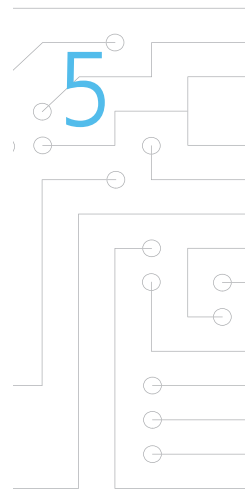
In preparation for NOF training, one-half of the staff in a school were undertaking a basic ICT skills qualification, the European Computer Driving Licence (ECDL). The course was delivered by staff from a local college of further education and took place in one of the school's computer suites. The staff developed good levels of competence in word-processing, file management, Internet searching and e-mail, and the use of spreadsheets. While most of the training took place after school in the teachers' own time, senior management provided the participating teachers with one lesson per week of protected time to practise and consolidate skills.

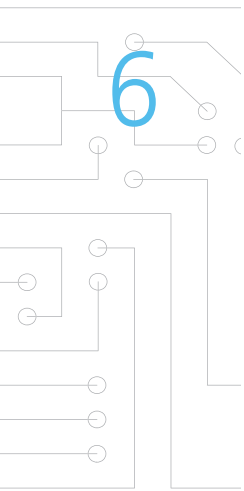
- 5.4 Good quality leadership at all levels is a critical factor in determining that pupils have worthwhile and challenging experiences in ICT. In the majority of schools the senior management team (SMT), including the ICT co-ordinator, provides strong leadership for, and clear direction in, taking forward the development of ICT throughout the school. The role of the co-ordinator is pivotal in identifying appropriately the levels of ICT competence and expertise among the staff, in devising an effective and well-paced programme for staff development and in setting targets for the further development of the pupils' attainments and skills in ICT.
- 5.5 In most schools, although ICT leadership is good, the commitment and involvement of subject departments are inconsistent in extending the pupils' learning using ICT. In a

significant minority of schools, the members of the senior management team (SMT) have a sound knowledge of the strengths and weaknesses in ICT provision across the school and monitor closely the contributions of subject departments to the pupils' attainments in ICT. In around one-half of the schools inspected the SMT, however, is not sufficiently aware of the contribution which individual subjects make to the development of the pupils' ICT skills.

In one post-primary school, the ICT co-ordinator created a culture of continuous evaluation and improvement in ICT provision. She assessed the extent of home ownership of computers and developed a good awareness of the existing ICT skills of the year 8 pupils entering the school. In addition, she carried out a 'mapping exercise' of the pupils' ICT experiences across KS3 and KS4 to determine the extent of cohesion and progression in the pupils' competence. Using structured interviews with heads of departments, she evaluated effectively the extent of ICT integration into subject teaching, and scrutinised carefully schemes of work in order to ensure the effective incorporation of ICT into subject planning and classroom practice. She analysed carefully the utilisation of the ICT suites by subject departments to gain an overview of the extent of ICT use across the school and to identify the areas where use is extensive or where there is a need for improvement.

- 5.6 Although ICT has a high profile in the development plans of most schools, the influence of ICT on the teaching of literacy, numeracy and pupils with special educational needs has not been evaluated effectively. A key finding of this report is that most schools need to direct more attention to using ICT to support work in literacy, numeracy and special educational needs in a more coherent and integrated manner.

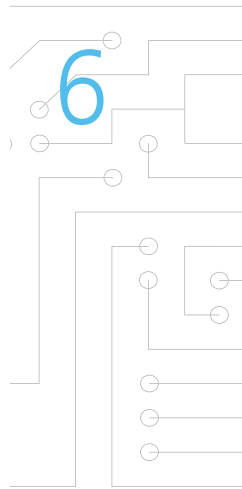


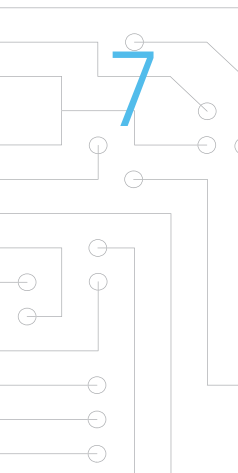


6. STAFF DEVELOPMENT

- 6.1 The New Opportunities Fund (NOF) ICT training is a major national initiative designed to improve the teachers' personal, subject and teaching competence with ICT. It places ICT at the heart of staff development priorities in all schools. Most school development plans set out a clear training strategy for ICT, often accompanied by action plans intended to achieve the objectives of NOF training. In a minority of schools, many staff have enhanced significantly their basic ICT skills through successful completion of qualifications such as the ECDL.
- 6.2 Most schools have invested considerably in ICT training, much of which takes place in the teachers' own time. Well-planned and organised NOF ICT training has been successful in raising the profile of ICT within schools and in enthusing many teachers. In a significant minority of schools, the NOF training model has been instrumental in changing the attitude, culture and approach of schools and teachers to the use of new technologies and teaching strategies in the classroom. There is clear evidence that many teachers have derived significant benefits, particularly in improving their level of personal proficiency in the use of ICT and in enhancing both their confidence and competence in using ICT to support learning.
- 6.3 The teachers in only a minority of schools have succeeded in integrating the new technologies effectively into classroom practice. Where this is happening, it leads to improvements in the pupils' learning and extends their experiences of ICT. These teachers are able to apply in the classroom the skills and knowledge they have acquired as a result of the training. In most schools, the impact of NOF training has been diminished due to the limited access to ICT resources for specialist subject teachers, during and after the training. The main challenge for most schools, departments and individual teachers is the further incorporation of ICT into classroom practice and particularly, its application within subject lessons.
- 6.4 A significant minority of schools have devised post-NOF training action plans, and set appropriate targets to address systematically the future ICT training needs of staff. Overall, there has been insufficient attention given by the majority of schools to evaluating the impact of NOF ICT training and to facilitating teachers in consolidating and developing further their skills.
- 6.5 The review and evaluation of ICT in-service training (INSET) by school management teams and heads of department need to be strengthened further. The outcomes of INSET, and its influence on planning for teaching and learning, classroom practice and the targets set by departments, are monitored closely in a only a few schools. In most schools, however, those with management responsibilities at all levels have an insufficient understanding of the impact of staff development in ICT on classroom practice and on the pupils' learning.

- 6.6 In the majority of schools, there are wide variations and inconsistencies across subject departments in the level of support provided by Curriculum Advisory and Support Services (CASS) of the Education and Library Boards (ELBs). Most schools benefit from good support for the basic ICT skills required by the NOF initiative. However, although a few departments make effective use of CASS and receive significant subject-specific training, there is a lack of support directed at the application of ICT within subjects. To sustain the momentum of ICT training, there is a need for CASS to provide teachers with post-NOF training and support, so that they can incorporate more effectively the use of ICT into the classroom.





7. ACCOMMODATION AND RESOURCES

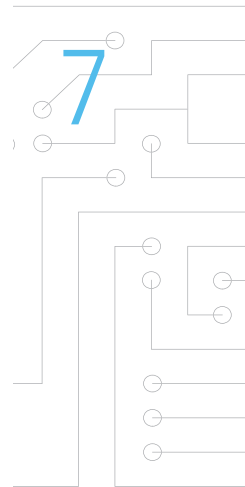
- 7.1 The accommodation and resources for ICT are good in 22% of schools and satisfactory in around 44%. In the remaining schools, the weaknesses in accommodation and resources outweigh the strengths, with poor accommodation and ICT resources in 11% of the schools. In most of the schools where the ICT resources are good, the computers have been distributed to good effect throughout the school. In addition to centralised computer suites, flexible and effective use is made of small clusters of computers in subject departments in these schools. The pupils have ready access to computers for research and presentation facilities when they are most needed, and the subject clusters are generally used well to support ICT work in the subject.
- 7.2 The ratio of pupils to computers ranges from 3:1 to more than 20:1, with an average of approximately six pupils for every computer. Personal computers (PCs) make up about 94% of the computer stock in schools. Approximately 50% of the PCs are up-to-date high specification computers, of Pentium 3 standard or better. In the majority of schools, there is still a considerable reliance on computers which have a low technical specification and are dated or obsolete. Around 31% of the computers in use are older PCs. Almost all schools have a good range of peripheral equipment available to teachers and pupils, including digital cameras, scanners and data projectors. Just over one-quarter of all schools have invested in interactive whiteboard technology; less than one-fifth of schools have video-conferencing equipment. Around two-thirds have a school website and 91% of schools have an acceptable use policy for the Internet as a safeguard against inappropriate use.
- 7.3 Almost all schools make use of local area computer networks of varying extent and capacity. Only 65% of the computer stock in the schools is networked. All schools now have a broadband connection to the Internet and this is used well in a significant minority of schools. In the majority of schools, the widespread use of broadband access is constrained by the lack of a cabled whole-school local area network. Only 50% of the computers in schools are connected to the Internet. Around 19% of the schools report that pupils find it difficult to access the Internet outside timetabled lessons and in 10% of schools the pupils have limited or no access to the Internet. In contrast, pupils have full access to the Internet in 30% of schools. In almost all schools, the use of e-mail to support and extend learning is still at an early stage of development and the facility is mostly under-used. Just over 18% of the schools provide internal e-mail accounts for the pupils; most still rely on Internet based e-mail service providers.

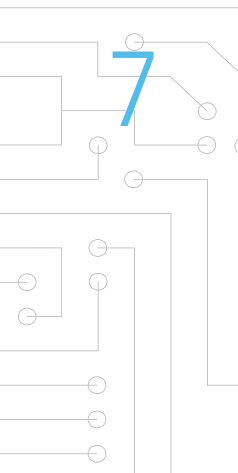
The pupils in a year 8 geography lesson used e-mail to communicate with pupils of a similar age group in Canada. Working in groups, the pupils prepared materials, including images taken with a digital camera, on aspects of school life, the local environment, the weather, transport and employment patterns of their families and the local community. They

developed a good understanding of their environment and compared this with materials received by e-mail from their peers in Canada. This sequence of lessons contained many aspects of good practice in the use of ICT and extended the pupils' research and literacy skills. The incoming and outgoing e-mails were read and created using the teacher's laptop and a data projector, and led to high levels of motivation and enjoyment for the pupils.

- 7.4 While 27% of schools report that they have school intranets in place, many of these are under-developed; they are used effectively to support learning in only a few schools. The better intranets provide pupils with flexible access to school noticeboards, e-mail accounts, subject learning materials, teacher notes and multimedia presentations, coursework guidance, subject extension activities, materials to support revision and links to relevant websites.
- 7.5 Just under 63% of the teachers have laptop computers; most of these have been distributed through the Connecting Teachers Initiative as part of C2k. Most teachers are making effective use of the laptops to enhance lesson planning and preparation. They are able to access and manipulate web-based learning materials and to communicate electronically with colleagues and the wider education community. In the majority of schools, flexible use is made of the laptops in classrooms by pupils, individually and in small groups, and an increasing number of teachers are using them well to support and enhance whole-class teaching, often connecting the laptop to data projection equipment. Access to the laptop computers has improved the personal ICT competence of teachers. They are more aware of the potential of ICT to enhance teaching and learning and most of them are keen to develop further their expertise, particularly in the use of the equipment in the classroom. The ready access to high specification equipment has improved their confidence and increased motivation to use ICT.
- 7.6 Almost all schools face a high demand for access to ICT resources from teachers and pupils, and the utilisation rates of computer suites and clusters are high. Many schools find it difficult to provide adequate access to ICT resources for subject departments. Subject teachers in one-half of the schools report that access to computer suites and other ICT resources is difficult. Around one-third of the schools provide good access for pupils to computers and the Internet in the school library. In these schools, access to the library is flexible and is available outside school hours. The potential of the school library as a central ICT resource area is under-exploited, however, and just under 4% of all computers in post-primary schools are located in the school library.

A feature of ICT provision in one school is the vital support role played by ancillary staff, in particular, the ICT "support" tutor and the librarian. The support tutor interacts well with the pupils and provides good support





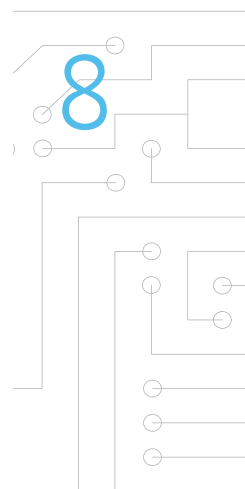
during lessons. The librarian is a member of the core team, has completed NOF ICT training and makes a positive contribution to the development of ICT in the school. She has prepared a library studies course on the use of ICT in the library, liaises effectively with the teachers on the topics they are teaching and identifies appropriate websites and other materials. In addition, she engages proactively with the pupils to assist and encourage them to make better use of ICT, whether it is using the Internet, CD-ROMs or word-processing and presentation work. The library is available for the pupils all day and after school.

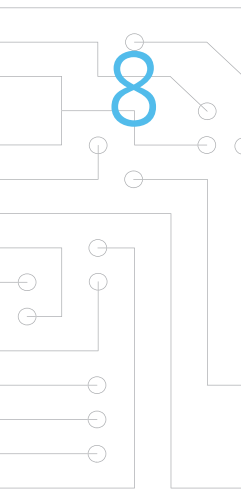
- 7.7 The quality of specialist computer suite accommodation varies considerably across and within schools. In the majority of schools, the computer suites are equipped with furniture designed for computer work, appropriate carpets, blinds, and trunking for electrical and data cables. The teachers and pupils would benefit, however, from improved layout of computer suites. In a significant minority of computer suites, the teachers have inadequate room to circulate and insufficient access to the pupils' workstations. In the majority of computer suites, there is insufficient space for the pupils to undertake paper-based planning and design work away from the computers. In a minority of schools, the pupils and teachers are constrained by outdated hardware and software. In addition, in these schools the computer suites are often cramped and poorly ventilated, with poor layout of workstations, unsuitable furnishings and inappropriate lighting.

8. SCHOOL EVALUATIONS OF ICT PROVISION

8.1 In the questionnaire sent to the schools, members of senior management were asked to evaluate ICT provision within the school. The evaluations provide a detailed insight into the progress made by schools in the development of ICT. The development of a culture of rigorous self-evaluation of the effectiveness of the provision for ICT is an important area for development for almost all schools. According to the findings of the self-evaluations completed by the schools:

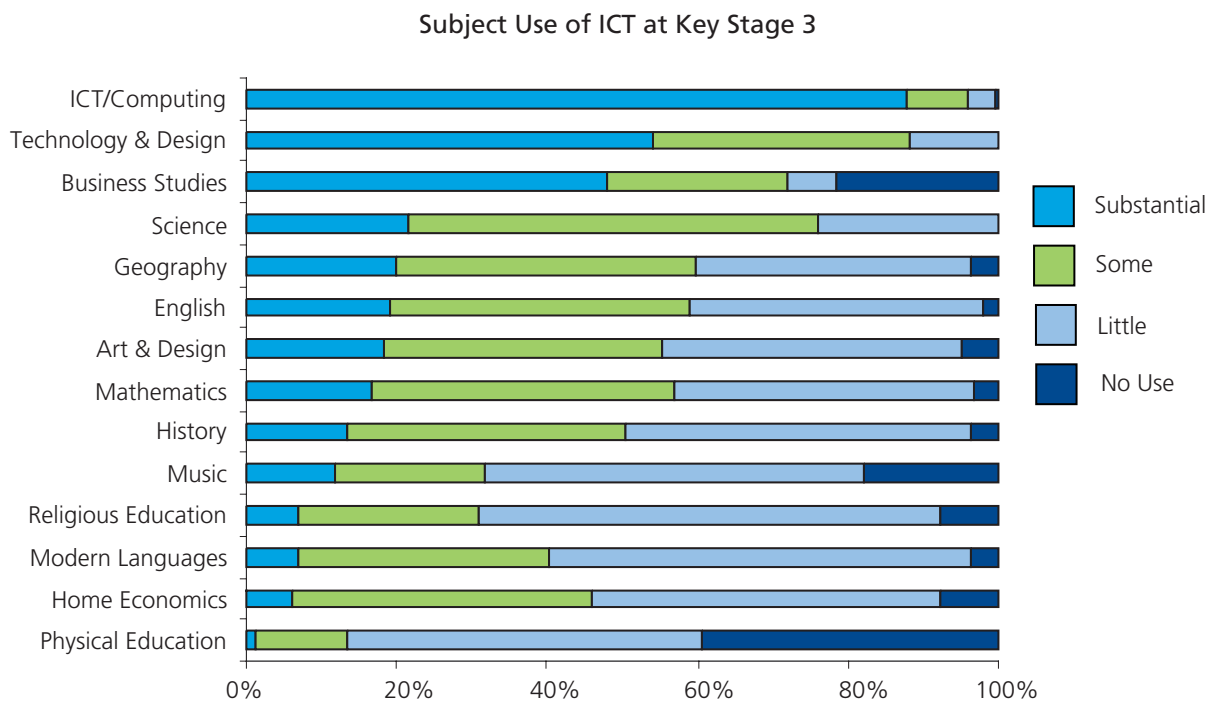
- the integration of ICT into the school development plan is well-developed, with over 80% indicating full or strong integration of ICT;
- subject departments in only 7% of the schools have integrated ICT fully into planning for teaching and learning; the majority of them (62%), however, indicate some integration of ICT into subject planning; in contrast, a minority (29%) of schools report little or no integration of ICT into subject planning;
- almost 40% of the schools take no account of pupils' ICT competences on entry to year 8. A further 36% take little account and only 4% take full account of pupils' prior ICT experiences;
- ICT is used well used to support pupils with special educational needs in only 20% of the schools;
- little or no use of is made of ICT to support the development of pupils' literacy and numeracy skills in just over 50% of the schools; only 10% of them indicate good use of ICT to support work in literacy and numeracy;
- there is little or no assessment and recording of the pupils' achievements in ICT in 33% of the schools;
- subject teachers have excellent access to ICT resources in 20% of the schools; in contrast, little or no access to ICT resources is reported in 26%;
- the pupils have satisfactory or good access to the schools' ICT resources outside timetabled time in 70% of the schools;
- there is little or no monitoring and evaluation of pupils' access to ICT by members of senior management teams in 40% of the schools; in contrast, 17% of schools report that pupils' access to ICT is monitored closely by staff at senior management level;
- senior management teams are well aware of the ICT competence of the teachers in 90% of the schools;





- ICT is used well to support management in 67% of the schools; only 4% of them report little use of ICT in school management;
- around 25% of the schools make significant use of CASS to support ICT developments; a further 46% report some use of CASS to support work in ICT.
- of the schools where teachers have undertaken NOF ICT training, 24% report that the training made a highly significant contribution to the development of ICT in the school; a further 43% of the schools report that the NOF training has had a significant influence, while 27% report little or no influence of the training;
- there is considerable variation in the integration of ICT into subject work at KS 3 (Figure 2), with substantial integration reported in technology and design and discrete ICT lessons; in contrast, integration of ICT is reported by schools to be weak in modern languages, music, physical education and religious education.

Figure 2



8.2 As part of the inspection, the schools' self-evaluation findings were compared with the evidence from inspection. This report confirms that the school self-evaluations were mostly undertaken effectively, and that the findings from the self-evaluations match closely the findings of the Inspectorate.

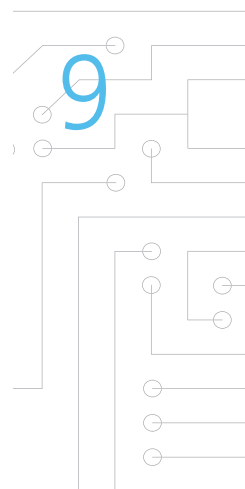
9. CONCLUSION

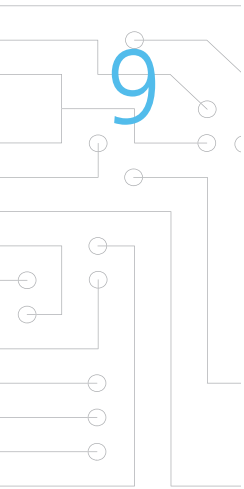
9.1 ICT as an educational tool offers much potential to enhance and enrich the way young people learn. Pupils are motivated by, and enjoy using, ICT. In almost all schools, the use of ICT to enhance subject work is improving gradually. There are many important strengths in the ICT provision in post-primary schools in NI. These include:

- the high priority given to the development of ICT in most schools;
- the good ICT leadership in the majority of schools;
- the satisfactory or good quality of teaching using ICT in a majority of lessons;
- the increasing and effective use of ICT to support whole-class teaching;
- the sound ICT skills developed by the majority of pupils;
- the good basic ICT skills developed by many teachers and an increased willingness among post-primary teachers to enhance teaching and learning through ICT;
- the external accreditation of the pupils' ICT competence at the end of KS3 in the majority of schools;
- the considerable investment in ICT resources by a significant minority of schools, placing them in a strong position to benefit from the implementation of the C2k managed service.

9.2 The report indicates that while there has been real progress in the development of ICT in post-primary schools, much remains to be done in the context of using ICT to enhance classroom practice within and across subjects. The inspection has identified a number of areas for improvement, and in order to strengthen the quality of ICT provision and to raise the learners' standards of achievement, there is a need for:

- better integration of ICT into teaching and learning in all subject areas;
- more effective deployment of resources to provide subject teachers with better access to ICT, and for schools to consider further the real benefit of clusters of computers located close to subject departments;
- clear progression in the development of the pupils' ICT skills, including building more effectively on their previous experiences;
- improved assessment and recording of pupils' achievements in ICT within and across subjects;





- the preparation of coherent and integrated strategies to support the use of ICT in the development of the pupils' literacy and numeracy skills, and to enhance the use of ICT to support special educational needs;
- more regular monitoring and evaluation by senior managers of the contribution of subject departments to the pupils' achievements in ICT;
- more even implementation of the various strands of the Strategy for Education Technology, in particular a better match between provision of NOF training and access for teachers to appropriate ICT resources.

9.3 This report confirms that many teachers have demonstrated high levels of commitment to improving their competence and confidence in ICT; in addition, they have worked hard to incorporate ICT into their teaching in order to enhance the pupils' experiences across the curriculum. There is a growing pool of teacher expertise in the effective and innovative use of ICT, and a wider range of suitable resources for ICT is becoming available. A firm foundation for future work in ICT has been established and much has been achieved to ensure that young people leaving post-primary schools in NI will have the necessary ICT skills and understanding for life and work in an information-based society.



APPENDIX 1

SCHOOLS INVOLVED IN THE INSPECTION

- City of Armagh High School, Armagh*
- Clounagh Junior High School, Portadown
- Cross and Passion College, Ballycastle
- Dalriada School, Ballymoney
- Dominican College, Portstewart
- Down High School, Downpatrick*
- Grosvenor Grammar School, Belfast
- Hazelwood College, Belfast
- Lagan College, Belfast
- Loreto College, Coleraine
- Loreto Grammar School, Omagh
- Malone Integrated College, Belfast
- St Aidan's High School, Derrylin
- St Breacan's High School, Londonderry
- St Colm's High School, Belfast
- St Columban's College, Kilkeel
- St Mary's High School, Downpatrick
- Ulidia Integrated College, Carrickfergus

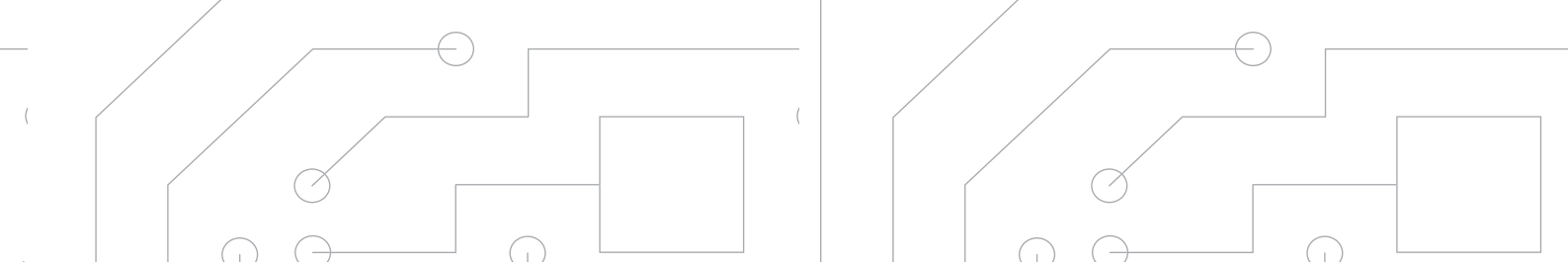
*** These schools were involved in inspection activity during the 2001/02 academic year which included the inspection of ICT.**



APPENDIX 2

GLOSSARY OF TERMS

Broadband	Describes the speed of network connectivity and services. Connection speed is measured in Kbps (kilobits per second) and Mbps (megabits per second). For example, all post-primary schools in NI have a broadband 2 Mbps connection to Internet services. At the moment, connection speeds above 384 Kbps are regarded as broadband. Connection speeds below this are called narrowband.
C2k	An ICT managed service, providing infrastructure, wide area network integration, curriculum content and user support to all primary, post-primary and special schools in NI.
Data projector	Allows an image that would normally be displayed on the computer screen to be projected onto a larger screen, for example, for presentation to a whole class.
Desktop publishing	The process of creating publications and documents using software with good graphics capability. Desktop publishing software allows images to be included with text and to be moved around in blocks, placed into columns and so on. The software is often used by pupils to create leaflets, newspapers, brochures and to present coursework.
E-mail	Involves the sending and receiving of messages electronically normally using the Internet.
Internet	A worldwide 'network of networks' connecting millions of computers using telephone and cable communication links.
Internet Acceptable Use Policy	Every school must create an acceptable use policy document outlining the ways in which the computers and the Internet can or cannot be used. Pupils and their parents or guardians are required to sign this document.
Interactive (electronic) whiteboard	An interactive screen linked to a computer, based on the design of a standard whiteboard. The computer image is projected onto the screen, normally using a standard data projector and has touch-screen control. Teachers and pupils have control over the computer by touching a pointer to the screen and can interact with a presentation or website in front of the whole class.
Intranet	A school intranet is a method of sharing information and resources in the form of a website, restricted to approved users within the school. The information is held locally on the school network and the users access the intranet through a web browser. Most intranets enable users to connect to the Internet.



IT in the Northern
Ireland Curriculum

There are four strands of IT competence in the Northern Ireland Curriculum. These are:

Communication;
Information Handling;
Modelling; and
Measurement and Control.

Pupils are assessed against eight level descriptions for each of the four strands of IT competence. The level descriptions describe the types and range of performance that pupils working at each level should demonstrate.

Managed service

A service which will supply networked computers, software content, connectivity to the Internet, e-mail and links to range of other wide area services. The service is supplied, installed and maintained by a service provider from the private sector. The managed service in NI schools is being procured through C2k.

Network

A network connects computers together and enables the sharing of software and peripheral devices such as printers and access to the Internet. Computers within the same school are normally connected to a Local Area Network (LAN), and the networks from different schools could be connected to become a Wide Area Network (WAN).

PC

Personal computer.

Search engine

An Internet tool that helps the user to find web pages using a keyword search.

Software

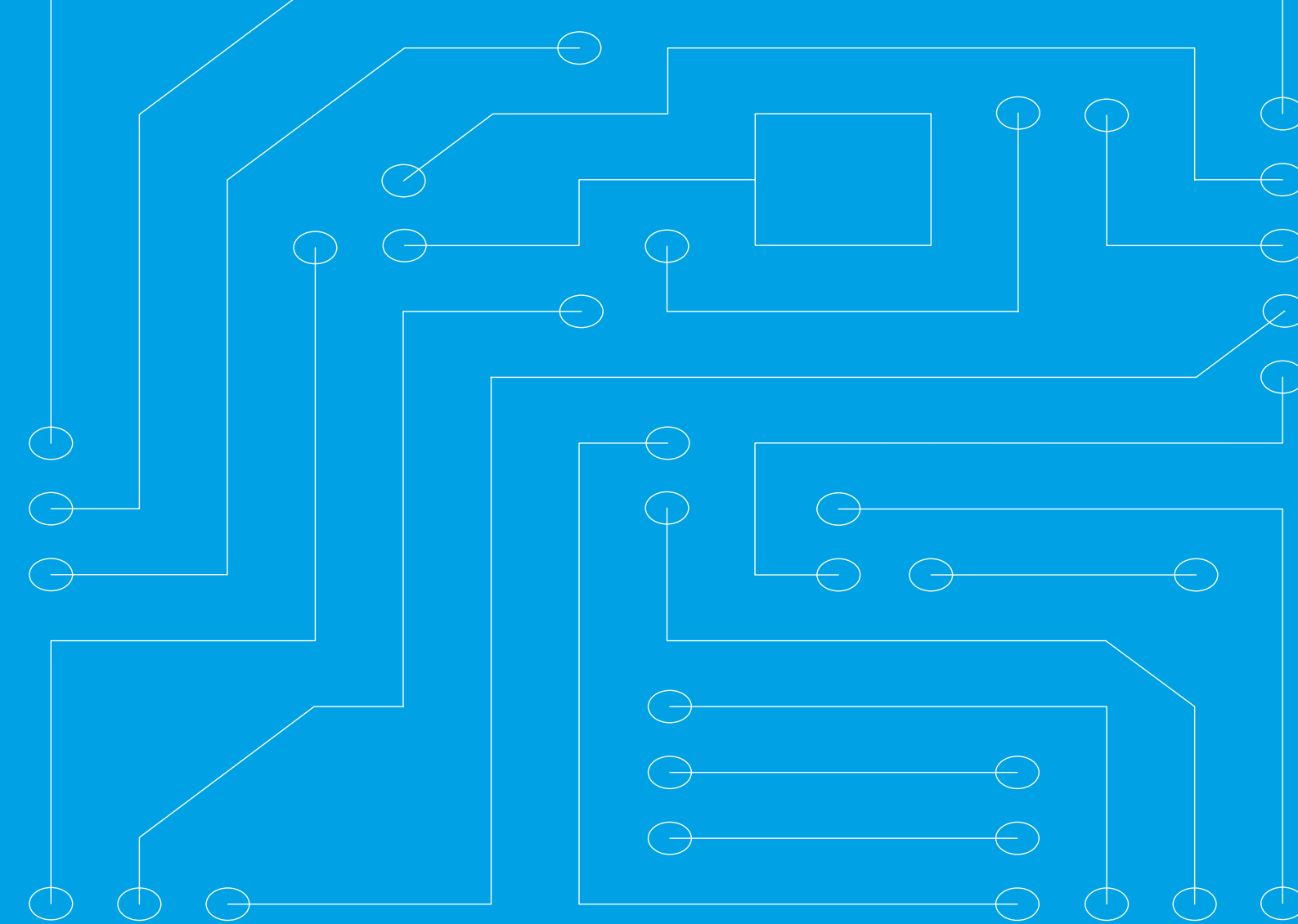
The applications (or programs) which run on computers, for example, databases, spreadsheets and word-processors.

Videoconferencing

A form of electronic communication that enables groups of pupils, situated at different locations, to communicate. They are able to see and talk with one another.

Web browser

A software application that locates and displays web pages. The two most popular browsers are Microsoft Internet Explorer and Netscape Navigator.



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