AN EVALUATION OF

Information
& Communication Technology
IN POST-PRIMARY SCHOOLS
2006

CONTENTS

PART ONE

1.   INTRODUCTION

1.1   The report summarises the findings of an inspection of the use of information and communication technology (ICT) 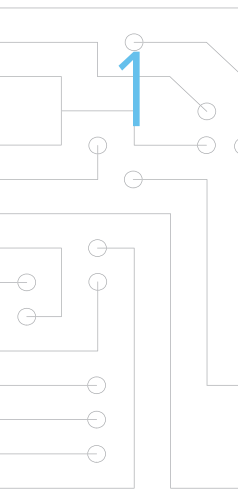in supporting and enhancing teaching and learning in post-primary schools in Northern Ireland (NI). The inspection was undertaken by the Education and Training Inspectorate (Inspectorate) during the 2005/2006 academic year. The objectives of the inspection were to evaluate:

   i.   the quality of teaching and learning using ICT;

   ii. the quality of planning, and the management arrangements for the development of ICT across the school;

   iii. the impact of ICT on the standards of the pupils' work; and

   iv. the range and quality of ICT resources, including the impact of the Classroom 2000 (C2k) managed service.

1.2   The findings from this survey are based on evidence from the inspection of 21 post-primary schools (Appendix 1); the majority (15) of these schools were part of the normal schedule of standard and follow-up inspections. The inspectors visited approximately 380 lessons across key stage (KS) 3, KS4 and post-16. Discussions were held with principals, members of the school management teams, 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. Most of the schools provided the inspectors with a written self-evaluation of their ICT provision and current stage of development.

1.3   In addition to evidence from the school visits, in June 2006, the senior managers of all post-primary schools were asked to complete an online self-evaluation questionnaire in order to provide important background information on ICT infrastructure, and an overview of ICT in post-primary schools. The Inspectorate appreciates the high return rate (71%) from schools, which contributed significantly to the evidence base upon which the inspection was able to draw.

1.4   This evaluation is a follow-up to the baseline survey, which was undertaken by the Inspectorate during the 2001/2002 academic year.
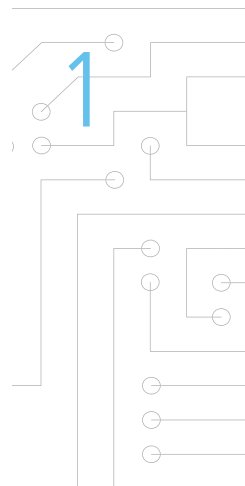
1.5   A number of quantitative terms are used in the report when commenting on aspects of provision for ICT. These terms should be interpreted as follows:

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%

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

Grade

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

2.   EMERGING ISSUES

2.1   Although the use of ICT as a tool for whole-class teaching and the pupils' independent learning has increased, there remains wide variation in the extent to which ICT has become embedded in the work of schools. When compared with the baseline survey of 2002, there is clear evidence to show, based upon an analysis of inspection grades, that the majority of schools have made slower than anticipated progress in the further embedding of ICT. The integration and embedding of ICT into the curriculum continue to be a major challenge for most post-primary schools in NI.

2.2   It is clear that ICT is still not a sufficiently routine or integral part of the teaching and learning process in the majority of post-primary schools, and the key reasons for this include:

- the inadequate emphasis on, and under-investment in, a systematic programme for the continuing professional development (CPD) of teachers, focusing on the necessary pedagogic skills to deliver effective learning and teaching with and through ICT, and building further on the foundations of the New Opportunities Fund (NOF) training initiative;

- the fact that ICT is not sufficiently integral to the school development planning process; most schools are struggling to translate strategies and policies for ICT into effective action plans, which have stated and measurable success criteria that are monitored, evaluated and reviewed;

- the lack of innovation in curriculum planning for ICT which has yet to become a driver for whole-school improvement in most schools;

- the relatively disjointed rhythm of the school day in most post-primary schools;

- the decline in the amount of curriculum and in-service support for ICT developments, along with the confusion across the schools as to which organisation should take the lead in relation to supporting schools and developing the teachers' pedagogic competence;

- the continuing lack of flexible access by teachers to appropriate ICT resources;

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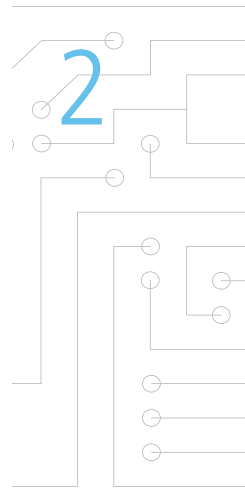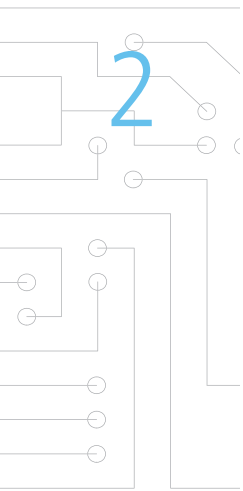
- the lack of awareness, expertise and experience among staff to implement learning platforms such as an intranet or a virtual learning environment (VLE); and

- the insufficient focus on the development of strategic ICT leadership skills for school leaders and senior managers.

2.3   The key features of the minority (14%) of schools where ICT is well embedded and its use is integral to the pupils' learning across many aspects of the school curriculum are:

- an accurate, up-to-date and agreed baseline of provision has been established;

- a focus on good quality teaching and learning, and high standards of achievement underpin the improvement agenda in the school;

- a clear strategic vision for the development of ICT exists and is a key theme in school development planning and the associated monitoring and evaluation processes;

- the C2k managed service is complemented by significant, sustainable investment in ICT, often in new technologies such as electronic interactive whiteboards, wireless-connected portable computers along with the full integration of legacy computers;

- the teachers have good access to ICT resources and there are effective support staff, with clearly defined ICT support and development roles;

- the well-informed, supportive and effective leadership and management of ICT, often through a shared approach by a dynamic ICT development group;

- the high levels of staff awareness and enthusiasm about the use of technology for teaching and learning, underpinned by the effective, targeted, and properly funded, continuing professional development of staff;

- the technology is used well to support and inform the management and monitoring of the work of school; and

- ICT is embedded successfully and assessed across a good range of subject areas, and complements the ongoing work to enhance the pupils' literacy, numeracy and broader skills.
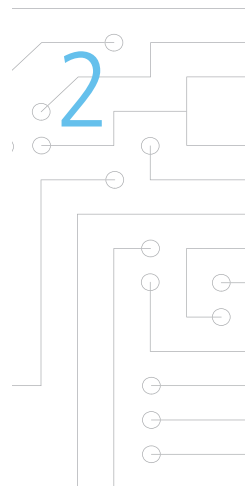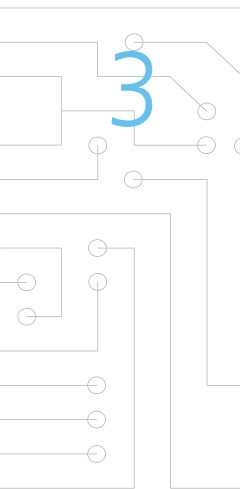
3. POLICY BACKGROUND

3.1 In September 1997, a comprehensive Strategy for Education Technology in NI was launched by the Department of Education (DE). This initiative resulted in significant investment in ICT in schools. The central themes of the strategy were to provide the infrastructure and connectivity to equip young people with the ICT competences they need for the emerging knowledge-based society and to ensure that teachers undertook professional development in the appropriate use of ICT to support and strengthen teaching and learning.

3.2 One of the critical achievements of the strategy was the creation of Classroom 2000, now known as C2k, which was tasked with the procurement and delivery of an integrated broadband ICT managed service for all schools in NI. C2k has worked successfully with a wide range of private and public sector partners to deliver a stable, reliable and technically well-supported service, which has been installed in all schools. As well as common local area and wide area network platforms, the schools have also benefited from a range of other key services such as connectivity and security, management information and administration, and local and online curriculum content.

3.3 An important aspect of the work of C2k has been the development of a regional educational network, at a cost of around £69 million. This wide area network encompasses all schools in NI and includes communications links and a data centre. A critical part of this network is the online learning platform, Learning NI (LNI), which was first deployed in 2004. The LNI on-line environment facilitates the development of teaching communities that can be used to collaborate in a variety ways, including the sharing of resources. It provides access to learning resources both inside and outside the school environment, streaming video, and conferencing and enables schools, libraries, local communities and other organisations to collaborate on developing and sharing joint learning programmes.

3.4 A number of schools have expressed concerns over the availability and current functionality of the LNI environment, and a few of them have begun to use alternative VLE solutions. There is a clear risk that the potential of LNI, offering a common VLE across all schools and components of the education system, will not be realised fully if a significant number of schools invest in alternative platforms.

3.5   In 2002, an extensive review of the strategy for education technology indicated that around 85% of the targets for change in schools had been met. By April 2003, around 94% of serving teachers and school librarians had completed the NOF ICT training programme. There is clear evidence that many teachers derived significant benefits from the NOF training, 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. Teachers are central to sustainable progress. A key factor in the lack of progress in embedding the use of ICT in learning and teaching in schools is that the sound foundations in staff development and the associated culture change in schools, established through the NOF training initiative, were not adequately built upon or enhanced in a strategic manner.

3.6   In 2004, the DE launched a new way forward known as 'emPowering Schools in Northern Ireland: A Strategy for Transforming Learning, Teaching and Leadership through Education and Technology Change'. Its aim was to build on the progress over the previous five years, and to provide a route-map with important milestones to be achieved by 2008. Most school leaders are aware of the emPowering Schools strategy, although only a minority of them report significant progress in implementing successfully the range of challenging milestones outlined therein. Around 60% of the schools report moderate progress in the implementation of the strategic milestones, with 24% reporting little or no progress. The implementation of emPowering Schools has not been adequately resourced by DE.

3.7   This is a critical time for the development of ICT. The Government continues to invest considerable funds to maintain the ICT infrastructure and resources in schools. Over £49 million, for example, was spent on the C2k managed service during the 2005/2006 financial year. However, progress in the implementation of the various strategies remains uneven, and important gaps remain.

3.8   In all schools, mostly through the implementation of C2k, there has been good progress in the provision of equipment, curriculum software and content, management information system and effective technical support. The absence of a parallel, and equally effective, strategy for the continuing professional development of, and support for, subject teachers has contributed greatly to the lack of adequate progress in the embedding of ICT in the post-primary sector.

3.9   The proposed statutory assessment of ICT as part of the revised NI curriculum, along with the centrality of ICT in meeting key aspects of the agenda for 'Entitled to

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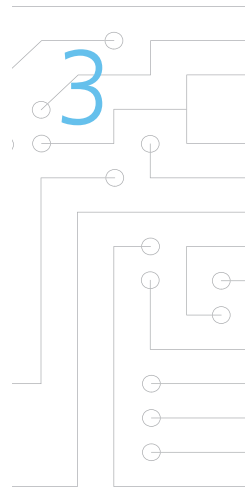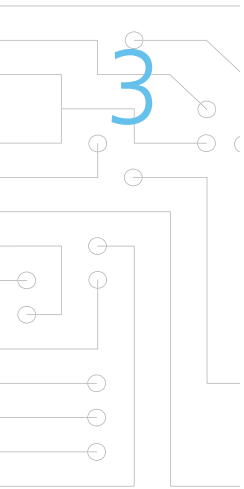
Succeed', have raised high level expectations and aspirations of what schools can achieve through ICT. More needs to be done to determine how best to deliver learning and assessment with and through ICT and how, as an enabling technology, it will underpin the range of Government strategies and initiatives for a modern curriculum in the post-primary school sector.

3.10   There continues to be significant commitment with regard to ICT developments by schools and other key organisations. A considerable number of schools, along with key organisations such as the Education and Library Boards (ELBs) and the Regional Training Unit (RTU), have participated in the broad range of pilot projects, courses and events to support and inform the respective strategies for education technology and empowering schools. These projects have been important in raising awareness of the strategic aims and milestones, improving understanding of the potential of ICT, and in broadening the capacity, expertise and experience of those involved. In most schools, however, the impact on capacity-building and the systemic embedding of ICT remains at an early stage.

4. SUMMARY OF MAIN FINDINGS

Provision for ICT

- The quality of provision for ICT varies widely. There are significant strengths in the quality of provision for ICT in only 14% of the schools inspected; strengths outweighed weaknesses in 33% of the schools. In contrast, weaknesses in the provision for ICT outweigh strengths in 48% of the schools and there are significant weaknesses in 5%. (Appendix 2)

- There is significant inconsistency in the range, challenge and frequency of the opportunities provided for pupils to learn and apply ICT skills. ICT is embedded strongly and sustainably in only a minority of schools, and the potential of technology to extend learning remains relatively under-exploited.

Planning for Learning and Assessment of ICT

- There are weaknesses in the quality of the teachers' planning for ICT in just under 60% of the schools inspected.

- Most post-primary schools fail to build upon the prior skills and knowledge of the pupils, even when their ICT skills have been accredited at the end of primary school education.

- In the majority of the schools, there is an urgent need to review, and strengthen significantly, the assessment and recording of ICT achievements within and across subjects.

- Around 79% of post-primary schools are registered for the CCEA Information Technology (IT) Accreditation Scheme at KS3; this is a significant achievement and a good foundation for these schools to build a flexible, progressive framework for the assessment of ICT across the curriculum.

- An increasing number of pupils are taking specialist ICT courses at KS4 and post-16 level.

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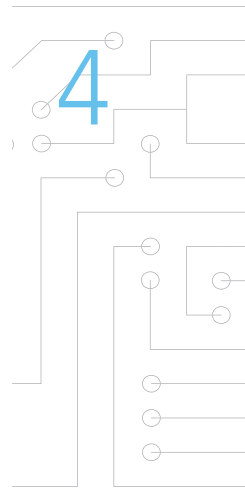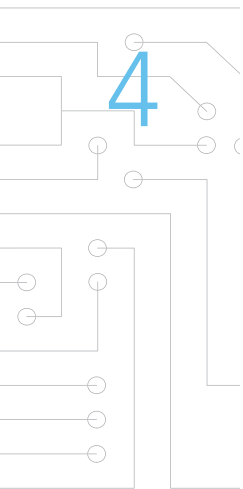
Teaching and Learning and the Pupils' Experiences

- The quality of teaching using ICT is improving gradually.

- The pupils' engagement in and attitudes to learning are mostly good in lessons which involve ICT-related activities.

- Where ICT is used effectively and regularly, it improves the pupils' motivation, their levels of attention, concentration and participation, and leads to higher quality work.

- There are clear indications that the ICT competence and capabilities of most pupils are developing year-on-year.

- In a majority of schools, the range and scope of the pupils' ICT experiences are narrow and, within school, have not kept pace with changes in technology.

- The use of the Internet by pupils is increasing.

- Too few schools take a systematic approach to the development of the pupils' information literacy skills.

- ICT is used rarely by pupils in their subject work to collaborate with pupils from other schools or colleges, participate in online courses or to submit work electronically to teachers.

- Inadequate use is made of ICT to facilitate collaborative links with key partners, such as other schools or further education colleges.

- A few schools have piloted successfully alternative curriculum models to support the further embedding of ICT and these enable the pupils to learn and apply ICT and other transferable skills in relevant subject contexts.

- An increasing number of schools are dealing on a more regular basis with issues around the misuse of new technology by pupils.

Management and Leadership

- There are clear weaknesses in the quality of management and leadership of ICT in almost one-half of the schools.

- The investment in infrastructure and ICT resources has not been accompanied by the development of adequate strategic ICT leadership skills for the senior managers and principals who have had responsibility for the implementation of the various milestones of the strategies for embedding new technologies.

- In a majority of schools, ICT is used well to support whole-school management and administration, mainly through the management information system (SIMS) modules.

- An increasing number of schools use ICT innovatively to inform and improve management of performance through effective target-setting and the analysis of data to monitor the progress of individual and groups of pupils.

- While a majority of schools have integrated ICT fully into the school development plan, often the associated action plans and targets remain incomplete, with success criteria which lack sharpness.
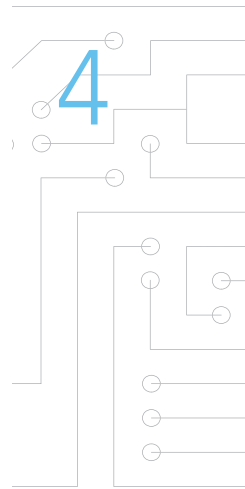
Staff Development

- In just over one-half of the schools inspected, weaknesses outweighed strengths or there were significant weaknesses in the provision of continuous professional development for teachers in ICT.

- There continue to be 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 (ELBs).

- A significant minority of teachers are not confident in their use of ICT and struggle to embed it into routine classroom practice.

- The potential use of ICT resources and online services to support the continuing professional development of teachers is under-developed.

Accommodation and Resources

- Almost all schools are satisfied (68%) or very satisfied (23%) with the C2k managed service solution.

- The quality, range and distribution of the ICT infrastructure in schools have improved significantly in recent years.
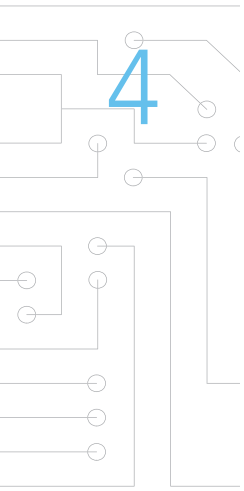
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- Since 2002, the average ratio of pupils to computers has improved significantly from 6:1 to around 4:1.

- The availability and use of whole-class presentational technologies such as digital projectors and electronic interactive whiteboards have become more widespread.

- In most schools, there has been inadequate investment in portable technology which can be deployed flexibly.

- Less than 25% of the schools facilitate access to ICT equipment by the local community.

PART TWO

5. PLANNING FOR LEARNING WITH ICT

5.1   Improved planning is required for pupils to develop and apply their ICT skills in relevant contexts across the curriculum subjects. The quality of teachers' planning for ICT is good to excellent in only 14% of the schools and satisfactory in 29%. There are weaknesses in the quality of planning for ICT in 57% of the schools.

5.2   The common strengths of the minority of schools that plan well for ICT include:

- the effective and optimal integration of ICT into the planning and delivery of subject work, and the planned alignment of ICT activities to underpin the subject learning outcomes;

- the sound embedding of ICT into the school development planning process, including systematic, effective arrangements for monitoring and review at department, and whole-school levels;

- a clear linkage between whole-school development planning for ICT and associated staff development needs;

- an enthusiastic, proactive and well-informed steering group shares the co-ordination of ICT and facilitates effective sharing of good practice;

- the thorough audit of staff and pupil skills, leading to a clear progression in the development of the pupils' ICT skills, across a sufficiently broad and challenging range of ICT applications and subjects; and

- an increasingly effective use of the school intranet to communicate with staff, share resources and ideas and to make learning resources and links to relevant external websites, available to pupils outside of classtime.

5.3   Few schools are aware fully of the range and level of their pupils' ICT skills, particularly on entry to the school at year 8. Post-primary schools need to build further upon the prior attainments and competences of the pupils, including their experiences of contemporary communication and leisure technologies outside of school.

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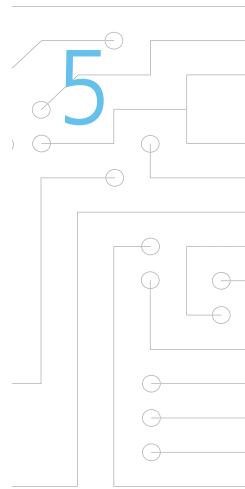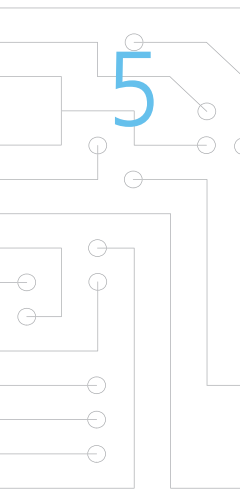
5.4 The variation in the pupils' ICT knowledge and competence on entry to the post-primary sector poses a major challenge for planning an appropriate and challenging curriculum, and can lead to a limited range of ICT experiences for pupils at KS3. In most schools, insufficient account is taken of the pupils' prior level of achievement in ICT, even when this is accredited. The planning does not adequately reflect the range of abilities and levels of ICT competence, there is insufficient challenge and purpose in much of the work involving ICT, and ineffective assessment or monitoring of the pupils' progress. In the minority of schools which exploit the pupils' existing ICT skills, they are encouraged to be more independent in their use of ICT and more creative in the ways in which they apply ICT to support learning.

5.5 The main indicators of less effective practice in planning for integrating ICT into teaching and learning include:

- an inadequate commitment to the use of ICT in the school development planning process leading to a lack of focus on ICT in departmental planning;

- departmental plans and schemes of work which are contrived or vague, and fail to identify clearly, or realise, the opportunities for using ICT to consolidate or extend subject learning;

- an over-focus on the ICT as a learning event in itself, resulting in task-driven activities which are often not matched well to the subject learning outcomes, the range of abilities in the class or the opportunities for the pupils to be more autonomous and creative in their application of ICT to subject work;

- little or no account taken of the assessment of the ICT related to the work;

- a lack of awareness of the content of the discrete ICT curriculum provision, resulting in considerable overlap and duplication of work and skills application; and

- insufficient planning for progression in the pupils' ICT skills, resulting in a lack of balance for the pupils in terms of exposure to an appropriate range of applications of ICT and challenge in the work.

5.6 It is noteworthy that many teachers have included the further use and embedding of ICT into subject teaching and learning as an objective of the Performance Review and Staff Development (PRSD) scheme. This has enhanced the profile of ICT in the teachers' planning, is improving teachers' awareness of the potential of ICT to

improve learning and, in some schools, is resulting in improved arrangements for monitoring and evaluation, and better opportunities for the sharing of good practice.

5.7 The majority of teachers continue to make effective use of ICT to improve lesson planning and preparation. They use ICT to improve and enhance the production, refining and presentation of resources to support pupils' learning. Increasingly, teachers are creating repositories of subject-based learning materials on centralised learning resource areas or school intranets for access by pupils and other teachers. Around 50% of the schools make regular use of either the C2k learning resources area or the public network drives as a repository for learning materials. Only a small number of schools, around 10%, have developed an effective school intranet to deliver and support learning. While the C2k managed service includes a remote or home-access capability for pupils to their school-based files, the use of this facility remains at an early stage in most schools.

5.8 An ever-increasing number of teachers, particularly those with good access to whole-class presentation technologies such as electronic whiteboards, make good use of Internet-sourced materials which are modified appropriately to meet the needs of the pupils. Nevertheless, most teachers would benefit from an improved knowledge and experience of using a VLE to support learning, the authoring and publishing of interactive learning materials, and the tools and practices of subject-focused collaborative online learning experiences and communities.
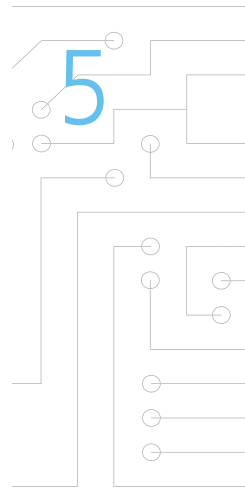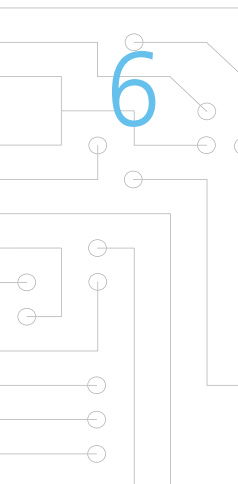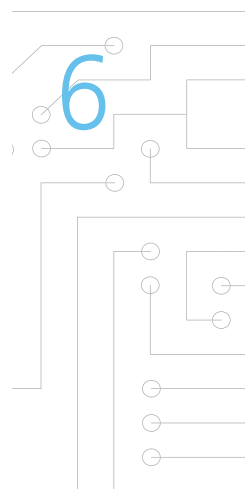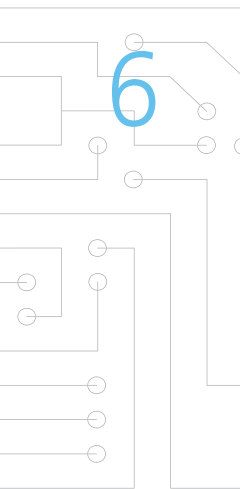
6. ASSESSMENT OF ICT

6.1 The assessment of the pupils' achievements and competence in ICT is good to excellent in 10% of the schools, with strengths outweighing weaknesses in a further 19% of them. In contrast, in 57% of the schools, the weaknesses in assessment outweigh the strengths, with poor assessment of ICT in 14% of the schools.

6.2 In the majority of schools, insufficient account is taken of the pupils' prior learning and competence in ICT on entry to the school, and as they progress from year to year. As a result, these schools are undertaking planning which is not sufficiently well informed, leading to a lack of coherence, challenge and breadth in the range of experiences of ICT provided for the pupils. In addition, they lack accurate information on the pupils' progression and achievements in ICT.

6.3 Around 79% of post-primary schools are registered in the CCEA Information Technology (IT) Accreditation Scheme at KS3; just under 19,000 pupils received certificates of ICT competence in 2006. This is a significant achievement and the scheme has been used to good effect in the majority of schools to highlight, broaden and strengthen the development of ICT within and across subjects. A major strength of the CCEA scheme is the emphasis on cross-curricular ICT and the application by pupils of their ICT skills in subject-focused assessment tasks. In 2006, almost three-quarters of the pupils entered for the scheme achieved level 6 or above, with around one-third of them achieving at level 7 in ICT. The scheme reflects closely the proposed statutory ICT assessment framework for the revised curriculum.

6.4 The majority of schools have not built upon the good foundations laid through participation in the CCEA scheme, and they continue to use tasks which are dated, insufficiently integrated into ongoing subject work, and often lacking in challenge and creativity for the more able pupils. These schools are over-reliant on CCEA to develop and provide the ICT assessment activities. In many of the schools participating in the scheme, the ICT assessment work is carried out by too few subject departments, is level-driven, and quite often takes place in the final few weeks of year 10. As a result, the focus is on the assessment outcomes as opposed to the planned ongoing development and associated monitoring of the pupils' ICT skills and their application to enhance subject work. In a minority of the participating schools, large cohorts of pupils are all achieving at the same level, which is not reflective of the range of abilities. In a few schools, it is inappropriate that all of the assessment of ICT takes place within the narrow confines of the ICT department.

6.5   An increasing number of schools are using school-generated tasks (SGTs) as part of the CCEA scheme of assessment. In these schools, the ICT tasks are better aligned to subject schemes of work and often incorporate relevant, interesting and challenging software applications such as digital video and other contemporary applications. More work needs to be done, however, as these schools remain a minority; only 12% of all post-primary schools indicated that they have devised four or more school-generated assessment tasks, with almost one-half of the schools reporting that have not designed any of their own subject-based ICT assessment tasks. Where schools are not offering the CCEA scheme of accreditation, insufficient information is available on the pupils' ICT competence and achievements at KS3.

6.6   The key features of those schools where the assessment of ICT is good include:

- the effective arrangements to baseline rigorously the ICT competence of the pupils on entry to the school;

- the opportunities for the pupils to develop, apply and have accredited, their ICT skills across a sufficiently broad range of curriculum subjects;

- the good arrangements for monitoring, recording and reporting the pupils' progress in using ICT;

- the assessment of the content and quality of the subject work along with the ICT, and the provision of constructive evaluative feedback to the pupils on how to improve their work, including the ICT aspects of the work;

- the exemplars of pupils' ICT work within and across subjects which are collated and often shared and celebrated; and

- the effective use of assessment information to inform planning, and provide appropriate levels of challenge to all of the pupils.

6.7   It is clear that many teachers are not adequately trained or skilled to develop further the pupils' ICT capabilities. In addition, many schools continue to have a low level of knowledge and understanding of the range and extent of their pupils' ICT skills, including the progress, if any, they are making, and what they have achieved. Only a small number of schools have effective arrangements for the monitoring and evaluation or self-evaluation of ICT provision.

6

6.8   The main indicators of less effective practice in the assessment of ICT, in the majority of schools, include:

•   the weak arrangements for the initial assessment of the pupils' ICT skills on entry from primary school;

•   the weak or inconsistent integration of ICT into subject teachers' planning;

•   a lack of understanding and confidence by many subject teachers in the assessment of ICT within subjects;

•   the over-emphasis on the presentation of work, as opposed to the relevance and quality of the content;

•   a lack of feedback from teachers on how well the pupils apply ICT skills and how they might improve these skills and their application;

•   inadequate focus on the monitoring and evaluation of the range and extent of the pupils' experiences in ICT; and

•   inadequate arrangements to monitor more systematically the range and quality of the work stored electronically by the pupils.

6.9   Assessing ICT remains an area of major concern. In too many schools, teachers do not evaluate adequately how well pupils use their ICT skills across the curriculum.

7. TEACHING AND LEARNING

7.1 The quality of teaching using ICT is good or better in 14% of schools and satisfactory in around 67%. In the remaining schools, the weaknesses in teaching using ICT outweigh the strengths. Since 2002, the quality of teaching using ICT has improved and the number of lessons where the use of ICT was good or better increased from one-quarter to just under 30%; in addition, the number of lessons with clearly identified weaknesses decreased from one-fifth of all lessons observed, to around one-sixth.

7.2 There are considerable differences among and within schools in the quality of teaching where ICT is used. In almost all schools, there are instances of innovative and effective use of ICT, although in the majority these lack coherence or consistency for the pupils. In addition, the good practice is not shared well within schools, or between schools. Overall, most schools fail to provide pupils with sufficiently good levels of access to ICT across the curriculum, or to provide a progressive experience for them through the key stages and beyond.

7.3 Although the majority of teachers have a generally good level of personal competence in the use of ICT, only a minority use ICT routinely to enhance learning in subject work. Where ICT is used effectively and regularly, it improves the pupils' motivation, their levels of attention, concentration and participation, and leads to higher quality work.

7.4 In the most effective lessons, the main enabling factors in the effective use of ICT in teaching and learning are:

- the teachers plan well for the integration of ICT, there is a focus on how ICT can enhance the quality of teaching and extend the pupils' subject learning;

- the suitably high expectations from teachers, the lessons are conducted at a brisk pace and achieve an appropriate balance between the use of ICT and activities away from the computers;

- a clear purpose to using ICT, which enriches the lesson outcomes and captures the interest and attention of the pupils;

- the good opportunities for pupils to talk about how they apply ICT and to explain its limitations;
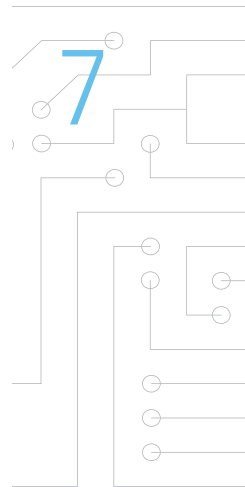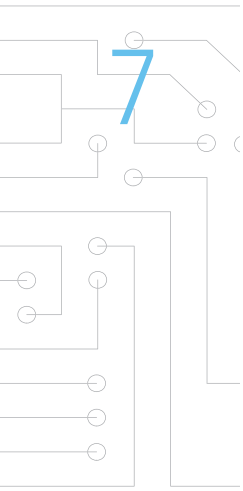
- the skilful questioning and well-focused intervention by the teacher, which are used to check understanding and extend the pupils' thinking;

- the encouragement for the pupils to show independence, autonomy and creativity;

- the ease of access to good quality ICT resources, in particular subject clusters; and

- the challenging tasks which are matched closely to the pupils' interests, experiences and abilities, and provide good opportunities for them to develop and apply a range of wider skills, including working collaboratively, solving problems and the application of thinking skills.

7.5   In the best practice observed, a whole-school focus on good quality teaching and learning exists. In addition, the teachers apply effectively a range of teaching and learning methods, and are encouraged to experiment with different styles of learning; thought is given to blended learning and there is an appropriate mix of ICT and other learning activities and ICT is used well to stimulate and promote discussion, extend subject work and pupils' understanding, and to facilitate well-focused independent study.

7.6   There are weaknesses in teaching using ICT in around 16% of the lessons. These lessons are not well planned or organised, often comprise whole-class rote activities and do not sufficiently challenge the pupils. The main indicators of poor practice in the use of ICT in teaching and learning include:

- the work, activities or lesson content which do not sufficiently capture the enthusiasm, interest and hence the attention of the pupils;

- the ICT activities that are unrelated to the subject learning outcomes;

- the undemanding activities, often caused by extensive duplication of the opportunities to apply ICT skills, involving a narrow range of software applications;

- the narrow range of teaching approaches, a lack of stimuli or variety, and too many missed opportunities for the imaginative use of ICT;

- an over-focus on trivial Internet research activities;

- work which is not sufficiently tailored to the ability levels of the pupils;

- a lack of purpose, relevance or context to the ICT activities, for example, creating multimedia presentations with little awareness of the potential audience and too few opportunities for the pupils to present their work as an outcome; and

- the insufficient account taken of the pupils' experiences and access to technology outside school.

7.7   Many schools have invested in the provision of whole-class presentation technologies, in particular interactive whiteboards. An increasing number of good examples of the use of ICT to enhance whole-class teaching were noted. This was particularly evident in those schools where the investment in new technology was underpinned by appropriate staff development, the teachers were provided with ample opportunities to familiarise themselves with the technology and operating software, and they were also exposed to good practice in the effective application of the electronic whiteboard to support whole-class teaching and learning.

7.8   There is clear evidence that, when used appropriately, interactive whiteboards, and to a lesser extent digital projectors, improve pupils' motivation and engagement, and increase the pace of the lesson. In the better practice, involving the use of whole-class presentation technology, the following features were present:

- the teachers prepare useful learning materials, which are often visually attractive and stimulating to the pupils;

- the technology is used to good effect to reinforce quickly, and at times demonstrate, previous learning underpinned by effective and inclusive questioning strategies;

- the teachers give clear presentations and demonstrations, often including the display of digital images, video-clips, diagrams or animation;

- the pupils' literacy skills are enhanced because they are more focused on the lesson content, are responsive to the use of visual images, most interact well with the teacher and peers, and the use of the technology provides appropriate scope for them to use their communication skills;

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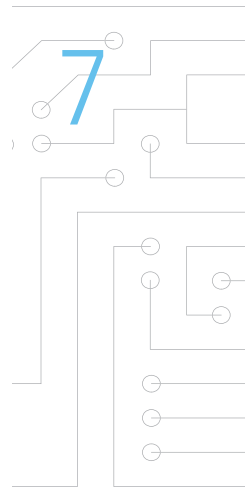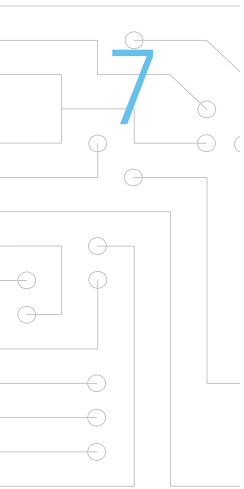
- where there is good questioning from the teacher and extended responses from the pupils, the use of this technology contributes effectively to the learning outcomes; and

- effective sharing of materials, resources and good practice with other staff; this leads to improved consistency and experiences for the pupils.

7.9   In around one-half of the schools, the functionality of the new technology is not exploited adequately, expectations from senior management are too low and many opportunities to enliven and extend subject learning are lost. In these schools, only limited use is made of the electronic whiteboards; they are employed in much the same way as digital projectors, and the teachers lack the technical expertise and confidence to integrate sufficiently the more advanced functionality of the technology as an effective teaching and learning tool. There is a need, in these schools, for a well-planned and coherent programme of training for the teachers in the use of the electronic whiteboard operating software, and for more opportunities for them to observe good practice in their own and other subjects, and other schools.

7.10   The most effective curriculum provision for ICT in schools happens when there is an appropriate balance between timetabled discrete lessons in ICT and its planned application across subjects. Typically, the discrete lessons are taught by specialists from the ICT or business studies departments and the pupils, for the most part, develop a sound range of skills in the traditional software applications, mainly word-processing, spreadsheet modelling and multimedia presentation software. In the best practice observed, in the discrete ICT provision:

- the work is aligned well with ongoing curriculum work and the pupils undertake problem-solving activities in appropriate contexts; these are well planned and provide a challenge for the more able pupils;

- the pupils acquire sound knowledge management and information literacy skills and they become discriminating users of ICT; they are able to research safely and to an advanced level, interpret, rework, evaluate and use appropriately web-sourced assets; and

- the pupils are provided with good opportunities to develop and apply ICT skills in an appropriate range of ICT software applications, including desktop publishing, web authoring, recording and editing digital video clips and the creation and manipulation of complex digital images, including animation.

7.11   There are weaknesses in the teaching of timetabled discrete lessons in around one-half of the schools, and the main indicators of the less effective practice are:

- over-directed styles of teaching, with too few opportunities for the pupils to work collaboratively, creatively or with autonomy;

- insufficient pace and challenge for the more able or more ICT-competent pupils, with many pupils merely consolidating existing skills;

- insufficient allocation of curriculum time, for example, a weekly 30-minute lesson, leading to slow progression in acquisition or application of skills by the pupils; and

- low level tasks and activities, often with meaningless outcomes.
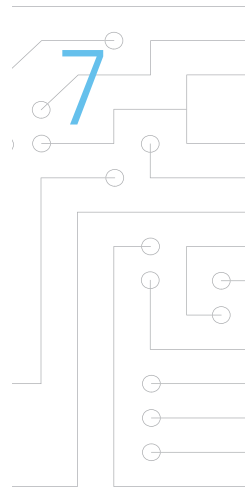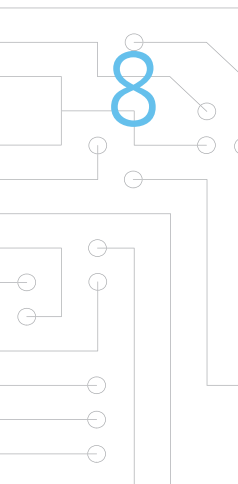
8. THE PUPILS' EXPERIENCES

8.1 In too many schools the range and scope of the pupils' ICT experiences are constricted and, within school, have not kept pace sufficiently with changes in technology. The range and quality of the pupils' experiences using ICT are good to excellent in 14% of the schools and satisfactory in a further 38% of them. There are weaknesses in the range and quality of the pupils' experiences in 48% of the schools.

8.2 There are clear indications that the ICT competence and capabilities of most pupils are developing year-on-year. Most are developing sound ICT skills and they use technology confidently and with enthusiasm. They understand the value of ICT, are increasingly reliant on using ICT to support their work, and many of them have clear ideas on how ICT can improve the quality and presentation of their work. There is growing, and increasingly sophisticated, use of ICT by pupils outside school and these skills and associated enjoyment need to be better integrated to complement and reinforce the learning process in school.

8.3 In too many schools, the pupils' experiences are narrow, mostly comprising the development and application of sound, research and presentation skills involving word processing, web-browsing and multimedia presentation software. Too few opportunities are provided for them to engage in more challenging, creative and stimulating applications such as digital video, electronic conferencing, music composition and editing, animation, web design, graphical manipulation and desktop publishing. In addition, pupils would benefit from better opportunities to share and exchange work and ideas electronically, and to publish their work in digital environments such as a school intranet, VLE or website. Since 2002, with the exception of a significant increase in the use of software for music composition, there has been little change in the software used regularly by pupils. (Figure 1)

Figure 1

Software Applications Used by Pupils
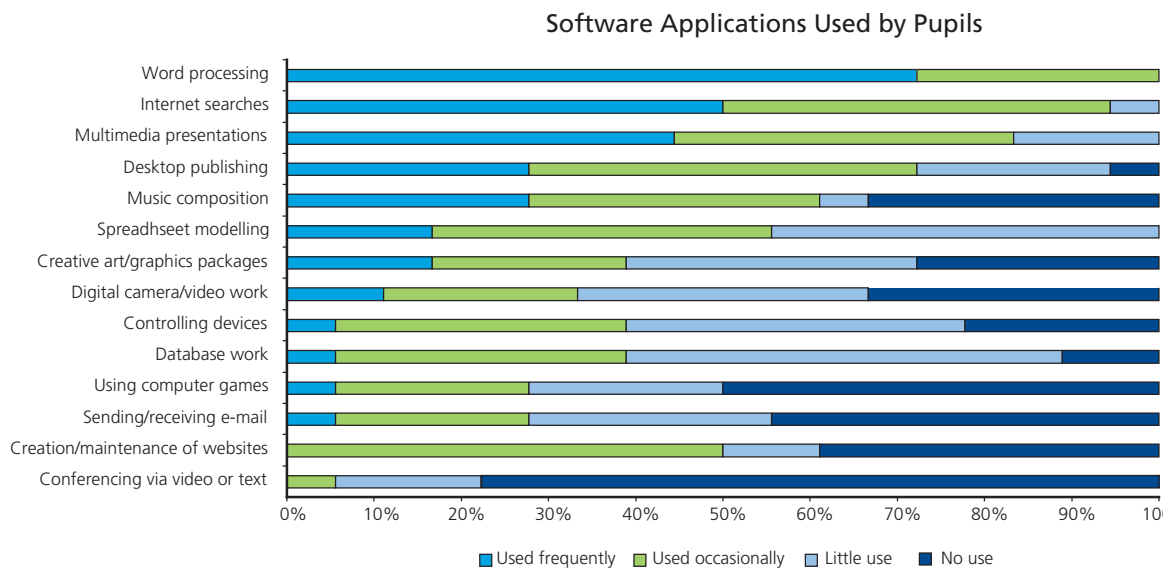
8.4   The pupils' engagement in, and attitudes to, learning are mostly good in lessons which involve ICT-related activities. When teachers integrate electronic whiteboard, digital projection or digital video equipment into lessons, the pupils respond in a positive way. Where ICT is well integrated into teaching and learning, and opportunities are provided for the pupils to develop and apply their skills across a sufficiently broad range of curriculum subjects, there is evidence that the pupils are well-motivated, they work well independently and in small groups, they acquire good problem-solving skills and can base decisions on well-researched and presented evidence. Where the range and quality of experiences are good or better, the pupils:

• apply ICT with imagination and creativity to support their learning in a range of subjects;

• regularly use a broad range of generic and specialist ICT applications and equipment, often to an advanced level;

• use ICT to underpin and develop further other important and transferable skills such as communication, team-working, managing information and problem-solving skills;
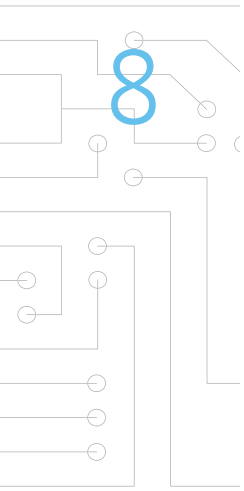
- enhance the presentation, and more importantly, the scope and quality of subject work;

- make sound and independent choices about the software and equipment necessary to best tackle particular problems and situations, and understand the limitations; and

- have clear expectations of the potential of ICT and can make decisions on how and when to learn.

8.5 There is, however, scope for improvement in the majority of subject departments to extend and broaden the range of opportunities provided for the pupils to develop and apply ICT skills and knowledge. Many opportunities to enliven lessons and to enrich subject work through the use of ICT are missed. In the significant minority of schools, where the range of ICT experiences of the pupils are too narrow, the key issues are:

- low expectations at all levels of the potential of ICT to enhance teaching and learning;

- an over-focus on a narrow range of software packages, mainly word-processing, multimedia presentation and web-browsing;

- the pupils' access to ICT within subjects is inconsistent, and often lacking in challenge or context;

- insufficient overview, evaluation or understanding (by senior management) of the pupils' ICT skills as they progress through the school, resulting in significant duplication of experiences and software and a lack of coherence, breadth or progression in the development of their ICT skills; and

- too few activities that provide the pupils with opportunities to investigate and solve problems or be creative.

8.6 The use of the Internet by pupils is ever-increasing. The pupils report that they use the Internet most to undertake research for school-based activities and coursework, communicate via 'chat-rooms' and social websites, play games, and to download and share music files. 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. Almost all pupils are competent in

8

the basic use of search engines to find information and they can download relevant materials which they generally use well to improve subject work, in particular, coursework.

8.7 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, many pupils struggle to cope with the huge and largely unorganised nature of the information available. Only a few schools take a systematic approach to developing the information literacy skills of the pupils, to equip them with effective strategies to carry out refined searches, determining authenticity of source, and for interpreting, evaluating, manipulating and using appropriately the information located, and for staying safe while online. Only a few pupils use to full effect the advanced features of search engines.

8.8 At KS3, the majority of schools provide a mixture of discrete ICT skills lessons, complemented by the provision of a range of opportunities for the pupils to develop and apply their ICT skills in subjects across the curriculum. The balance between teaching ICT skills discretely and their application across subjects varies across schools, with the discrete lessons being gradually replaced by more cross-curricular delivery as the pupils progress from year 8 to 10.

8.9 A few schools have piloted successfully alternative curriculum models to support the further embedding of ICT. These include reallocation of the time for discrete lessons to a core subject with a proven track record of embedding ICT to extend subject work, or more often, the use of non-timetabled days where a class or year group work together on a project or theme, underpinned by the application of ICT and other skills. In both of these situations, the pupils learn and apply ICT and other transferable skills in relevant subject contexts and the planning for ICT is better aligned with subject planning.

8.10 An increasing number of pupils are taking specialist ICT courses at General Certificate of Secondary Education (GCSE) and post-16 level. Since 2002, the numbers taking GCSE ICT has more than doubled; over the same period, enrolments for General Certificate of Education (GCE) AS and A2 ICT courses have almost quadrupled. At KS4, the most popular specialist course in ICT is the GCSE course, with over 70% of schools delivering this; around one-fifth of the schools enter more than one-half of all KS4 pupils for the GCSE ICT course. Around 40% of the schools enter pupils for the business and communications systems course, also at GCSE level. The schools
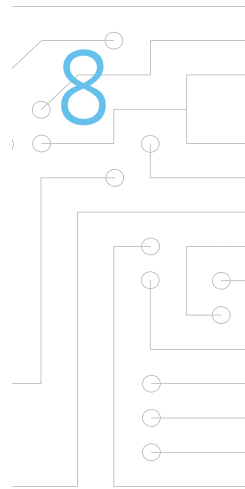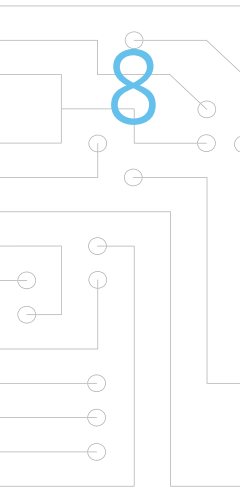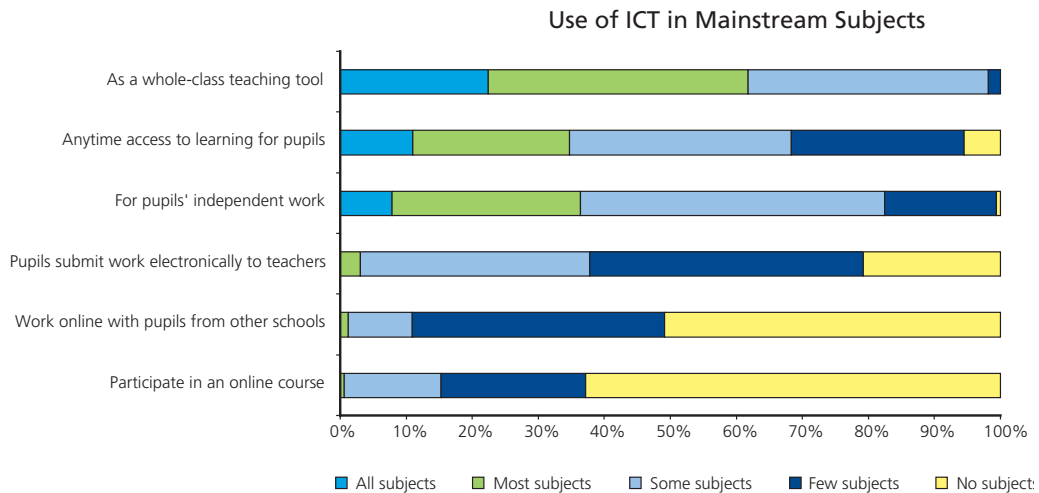
also provide the pupils with access to a range of other ICT-related courses, including applied GCSE (5%), Clait (16%), ECDL (6%), occupational studies digital technology option (8%), ICT key skill (10%) and text processing (8%).
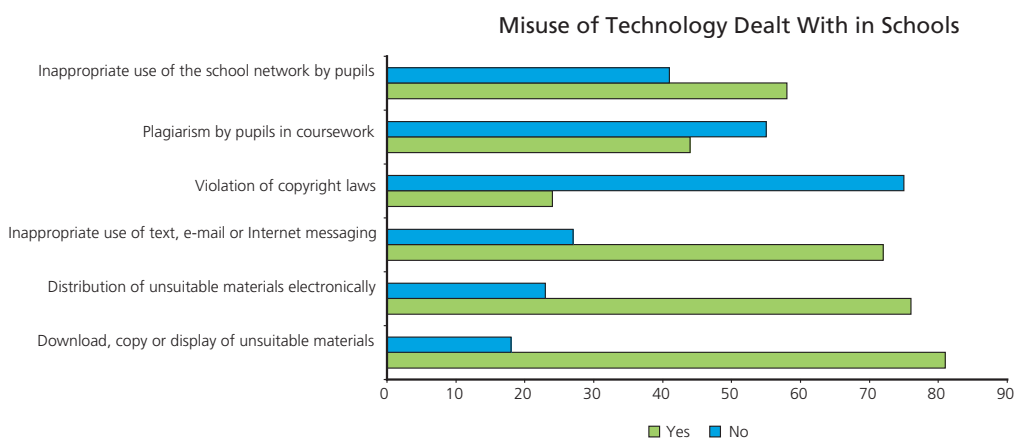
8.11   The pupils taking the GCSE ICT course develop a wide range of ICT skills at an appropriate level. They exploit the more advanced features of software application packages to design web pages and multimedia presentations, produce booklets and newsletters, create databases, and solve realistic problems 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 quality of the coursework for the GCSE in ICT is of a particularly high standard in some schools and often complements well the coursework being completed for other subjects. A small number of schools continue to provide pupils with the opportunity to achieve the ICT key skill, mostly at levels 2 and 3. In a few of the schools offering the key skill course, a strong emphasis is placed on the systematic development of the pupils' ICT skills using a range of appropriate contexts and the portfolio assessment mostly comprises work completed for other subjects, for example, GCSE coursework.

8.12   The schools report that the predominant use of ICT in mainstream subjects is as a tool to support whole-class teaching (Figure 2). Increasingly, the pupils are accessing subject learning materials to support independent study or revision outside classtime, normally through a school intranet, learning resource area or public network drive. It is a concern that ICT is used least by the pupils in their subject work to collaborate with pupils from other schools, participate in online courses or to submit work electronically to teachers.
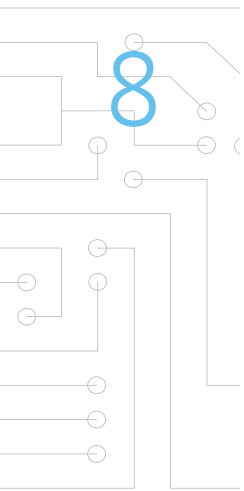
Figure 2

Use of ICT in Mainstream Subjects

- As a whole-class teaching tool
- Anytime access to learning for pupils
- For pupils' independent work
- Pupils submit work electronically to teachers
- Work online with pupils from other schools
- Participate in an online course

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

■ All subjects ■ Most subjects ■ Some subjects ■ Few subjects □ No subjects

8.13   There is growing concern in many schools over the risks posed by the escalating opportunities for the misuse of digital technology. In recent years, an increasing number of schools are dealing on a more regular basis with issues around the misuse of new technology by pupils, including various forms of bullying, downloading and sharing of unsuitable materials and the design and maintenance by pupils of networked personal web pages with inappropriate school-related content. (Figure 3)

Figure 3

Misuse of Technology Dealt With in Schools

- Inappropriate use of the school network by pupils
- Plagiarism by pupils in coursework
- Violation of copyright laws
- Inappropriate use of text, e-mail or Internet messaging
- Distribution of unsuitable materials electronically
- Download, copy or display of unsuitable materials

0   10   20   30   40   50   60   70   80   90

■ Yes ■ No

8.14   Young people have enhanced access to advanced mobile communication equipment with many features, including various forms of digital communication and messaging, storage space, wireless connectivity to other devices and the ability to record still and moving images. Outside school, many pupils access popular Internet chat-rooms and online social networking sites. Around 43% of the schools report that the inappropriate use of digital communications is extremely rare, 38% of the schools report having to deal with this on an annual basis with just under 20% dealing with problems on a termly basis.

8.15   Most schools are well-informed about the problems posed by new technology, with 86% of them reporting that they have reviewed pastoral care and child protection policies to account for them. Around 96% of the schools report that they provide advice and guidance to pupils on the appropriate use of the Internet and the importance of staying safe while online, with 86% of them indicating that staff are provided with advice and guidance on dealing with issues around the misuse of new technology by pupils. Virtually all schools have a written policy governing the use of the Internet, which is issued to staff, pupils and parents.

8.16   There is a need, in all schools, for regular and on-going staff development associated with the clearly identified links between rapidly advancing technology, and the potential threat this poses for child protection. There is an urgent need for further guidance from DE, which is updated on a regular basis and is responsive to changes in technology. In addition, schools need to ensure that there are appropriate arrangements in place to educate pupils on safe and appropriate behaviour while online, and to revise continually their policies and procedures for child protection, and indeed staff protection, in light of the changes in technology.

9. MANAGEMENT AND LEADERSHIP

9.1 The quality of the management and leadership of ICT is good or better in 14% of the schools and satisfactory in a further 38% of them. Weaknesses in the quality of management and leadership of ICT outweighed the strengths in 38% of the schools inspected, and there were significant weaknesses in the remaining 10%.

9.2 The investment in ICT infrastructure, mainly through the C2k managed service, has resulted in NI schools having advanced facilities and resources, including secure broadband Internet connectivity and access to software and content. While this opened up a wide range of learning and teaching possibilities and opportunities through ICT, it has not been accompanied by the development of adequate strategic ICT leadership skills for the senior managers and principals who have had responsibility for the implementation of the various milestones of the strategies for embedding the new technologies.

9.3 Information and communication technology is used well to support whole-school management and administration, mainly through the SIMS modules, in a majority of schools. A significant minority of schools are making effective use of e-mail as a means of communication with all staff, on a daily basis. An increasing number of schools are using ICT innovatively to inform and improve management of pupil performance, through effective target-setting and the analysis of data, to monitor the progress of individuals and groups of pupils. However, the potential of ICT to become a focal point for whole-school improvement and to influence and raise pupil achievement and standards in most schools, has not been realised. This requires a change in culture to a leadership which focuses more on the learner. A majority of schools have integrated ICT fully into the school development plan, but often the associated action plans and targets remain incomplete; important success criteria are either absent or lacking in sharpness and the intended improvements in learning, teaching and standards are not quantified adequately.

9.4 Most schools have an ICT strategy or development group but there are variations in their effectiveness. Pupils' access to ICT, for example, is monitored closely by senior management in only a minority of schools and the pupils' ICT experiences, along with the extent of their progression, are not monitored and evaluated sufficiently in a majority of schools. In addition, subject departments in a majority of schools have not integrated effectively ICT into their planning for teaching and learning. In too many schools, the ICT development groups focus too much on technical issues

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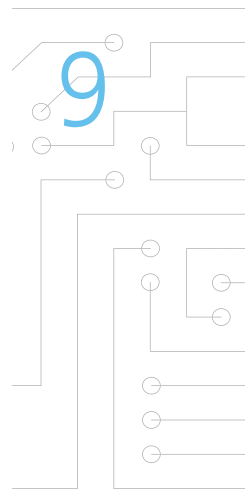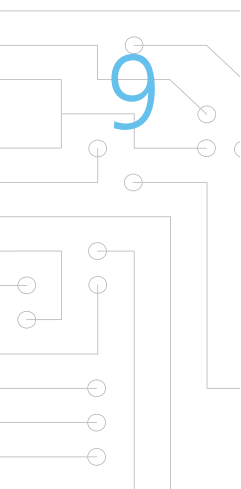
around the implementation of C2k and deployment of resources. In those schools where the ICT development groups addressed the use made of ICT by pupils and staff, and undertook a quality assurance role in relation to the embedding of ICT across the school, they were more effective in the cross-curricular embedding of ICT and ensuring a more coherent and progressive development of the pupils' ICT capabilities.

9.5   Good quality leadership at all levels is a critical factor in determining that pupils have worthwhile and challenging experiences in ICT. In the schools where leadership of ICT is successful, evidence from inspection indicates that:

- development work is supported strongly by the Principal;

- there is an ambitious but realistic vision for ICT, which is outlined explicitly in the school development plan and associated departmental planning;

- roles and responsibilities for the leaders of ICT are clear and underpinned by the allocation of adequate time to undertake effectively the complex management, co-ordination and evaluative functions;

- there is a strong emphasis on collaboration and clustering with other schools and colleges, to ensure that staff benefit from the best possible continuous professional development in order to transform their practice; and

- the schools engage in a robust self-evaluation process which leads to an accurate audit and consequent action planning for the successful integration of ICT into learning and teaching across the whole school.

9.6   A significant minority of teachers appear unwilling, resistant or reluctant to engage meaningfully with ICT and to integrate it into their teaching methodologies; in these instances, firm leadership from senior managers is lacking and a change of culture is required if confidence and competence are to be fostered. The teachers in many schools have not yet embraced fully enough the potential of the new technologies to transform their practice in the interests of their pupils.

9.7   In almost one-half of the schools, there is limited vision displayed by both senior and middle management, who perceive ICT as a narrow, event-driven activity, and not as a tool for use by the whole school, or one which could drive whole-school improvement. The characteristics of the less effective practice in the leadership and management of ICT in schools include:

9

- ICT development planning which is not sufficiently integral to the school development planning process;

- the weak arrangements to support the monitoring and evaluation of ICT provision on a whole-school basis, leading to a lack of awareness and understanding of the range and level of the pupils' ICT skills, or the contributions of subject departments to the pupils' attainments in ICT;

- the lack of commitment, involvement or representation of subject departments in extending the pupils' learning using ICT;

- the success in ICT measured in terms of technology provision or access, rather than outcomes in teaching practices and pupils' learning;

- centralised ICT resources;

- limited opportunities for the sharing of best ICT practice; and

- a superficial approach to staff development for ICT.

9.8　　The senior managers in the majority of schools recognise the need to introduce a more systematic and consistent approach to implementing and monitoring the cross-curricular provision of ICT. This requires the establishment of a clear and accurate baseline of current provision, which can be built upon. A few of the more progressive schools are planning, and setting targets for, the implementation of the Becta Self-Review Framework (SRF), which enables them to undertake a structured evaluation of their progress in embedding ICT across the key areas of provision; this approach has much to recommend it.
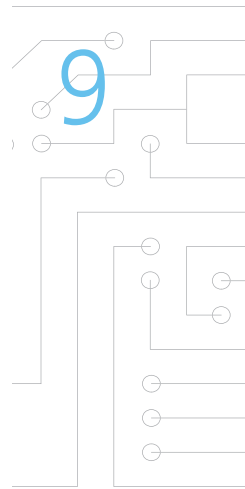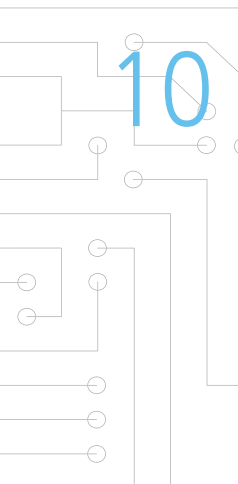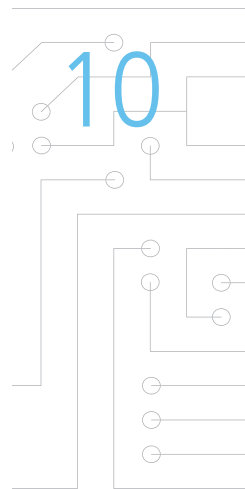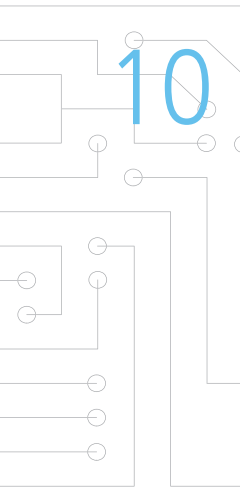
10. STAFF DEVELOPMENT

10.1 The lack of adequate ICT staff development opportunities remains one of the weaker areas of ICT provision in schools. The quality of staff development for ICT is good or better in only 14% of the schools and satisfactory in a further 33% of them. In just over one-half of the schools inspected, weaknesses outweighed strengths or there were significant weaknesses in the provision for the continuous professional development (CPD) of teachers in ICT.

10.2 Although teachers are pivotal to future progress, they have not benefited from adequate levels of post-NOF training and support, or sufficient guidance on the innovative use of generic software and new technology in the subject classroom, workshop or laboratory. The majority of schools report that some staff have benefited from post-NOF ICT training and support. The teachers in over one-third of the schools, however, have had little or no professional development in ICT since their initial NOF-sponsored ICT training. Staff in many schools have been left to their own devices, and have been obliged to rely on expertise within their own schools in order to organise ICT training of a self-help nature. The schools report that the main source of ICT-related professional advice and guidance has come mostly from colleagues and technical support staff within their own school.

10.3 There continue to be inconsistencies across subject departments in the level of support provided by the CASS Services of the ELBs. While the various strategies for the development of ICT, including the C2k managed service, have been devised and implemented on a regional scale, the underpinning support structure is delivered at a local level through the ELBs; this has led to variation in support and guidance for schools. The CASS officers have been stretched by the need to implement and support other regional initiatives such as the strategies for literacy and numeracy and the revised curriculum.

10.4 Support from CASS has positively influenced classroom practice across subjects in a significant minority of schools. In the majority of schools, however, it has had little or no impact on subject development. Only a small number staff, in less than one-half of the post-primary schools, have undertaken significant ICT-related in-service training (INSET) in their subject areas over the past two years. Due to the lack of subject specific ICT training, including appropriate familiarity and use of the software titles and content available, a significant minority of teachers are not confident in their use of ICT and do not use ICT routinely in their classrooms.

10.5   Schools report that they are often unclear regarding which organisation should take the lead in relation to the in-service training of teachers in ICT. As a consequence, in many schools the ICT experiences of the pupils and the CPD needs of the teachers are not given sufficient attention. The current divisions in responsibility between organisations are in urgent need of review and revision. In the absence of an effective and coherent framework for support and guidance in ICT matters, it is likely that many schools will continue to struggle to make effective progress in learning and teaching using ICT.

10.6   There needs to be a stronger focus by DE on the implementation of the emPowering Schools strategy and on the further embedding of the milestones within school and department development plans. The potential use of ICT resources and online services to support the CPD of teachers is under-exploited. More needs to be done to ensure that teachers have personal experiences of learning enhanced by ICT so that they better understand the pedagogy. A recent project, 'School Empowerment through ICT', supported by the ELBs and the RTU, involving 22 post-primary schools, demonstrated some of the potential but indicated also that this practice is in its infancy. Other useful projects, such as the Dissolving Boundaries project, which links schools north and south for joint project work through video conferencing, are providing teachers with opportunities for shared professional development, and there is scope also to adopt the methods employed more widely.

10.7   It is noteworthy that several of the schools inspected were highly supportive of the work of the creative learning centres established to encourage and support the use of digital technology in education, in particular, the Armagh Multi Media Access (AmmA) centre. As a result of effective INSET and other work undertaken here by teachers, the pupils in their schools have benefited from access to a broader range of software applications to support creative work, and improved opportunities to incorporate ICT and develop, extend and apply creative skills, mainly in subjects such as art, music and moving image.

10.8   In most schools, the personal ICT competence of staff continues to increase, although more so in the use of various software applications than in making effective use of the range of ICT resources to improve learning and teaching. In a significant minority of schools, a high priority is afforded to the CPD of staff, resulting in consistently high levels of personal competence and confidence in the use of ICT to enhance teaching and learning. In these schools, there is good evidence of staff sharing practice and resources, and the teachers are supported well by school

10

management. There is often good use of ICT to support communication between management and staff and between and among staff themselves.

10.9   The key strengths of those schools where staff development in ICT is successful include:

- the CPD is an on-going school priority, and staff are prepared to innovate and experiment;

- a culture of openness exists and staff are encouraged and facilitated to collaborate and share learning resources, expertise and good practice, often with staff from other schools;

- the heads of department are pivotal in the identification of the learning and training needs of staff, and in the monitoring and dissemination of the outcomes of staff development programmes;

- senior managers recognise the need to implement a systematic and coherent programme of continuing professional development that is aligned closely to their school's vision for ICT and linked appropriately to the objectives and targets in the SDP;

- the acquisition of new technology such as electronic whiteboards is matched by good opportunities for staff development, including an experience of effective subject practice in other schools;

- good use is made of appropriate external agencies; and

- the teachers are provided with personal experiences of learning enhanced by ICT and they understand better the pedagogy and how they can apply it for the benefit of pupils.

10.10   A particular feature noted in a few schools that are committed strongly to the promotion of staff development was their close collaboration with 'ICT expert' teachers from recognised ICT-rich schools. This inter-school training model focused mainly and appropriately on the use of the new technology in the classroom, and not on the functionality or 'gimmickery' of the technology itself. These collaborative models are successful and the inter-school dimension allows for the greater sharing of good practice, with teachers benefiting from visits to observe ICT work in other schools and institutions; this approach should be adopted by more schools.

10.11   The less effective practice in the CPD of teachers, evident in the majority of schools, includes:

- a lack of strategic direction for, or adequate investment in, ICT CPD opportunities for staff;

- inadequate thought given to building on the foundations laid by the NOF training initiative;

- CPD which takes place in an informal or 'ad hoc' manner, not sufficiently linked to the school's development priorities, with inadequate arrangements for monitoring and evaluating the impact on learning and teaching;

- an insufficient focus on the sharing and disseminating of the existing good practice; and

- lack of awareness of staff training needs.

10.12   In most schools, there is a need for senior management to consider strategies by which the many areas of good classroom practice using ICT can be shared across departments. The dissemination of good practice needs to be developed further in the majority of schools to help improve learning strategies across all departments. In many schools, there is a need for the pockets of good practice which exist to be disseminated more effectively.
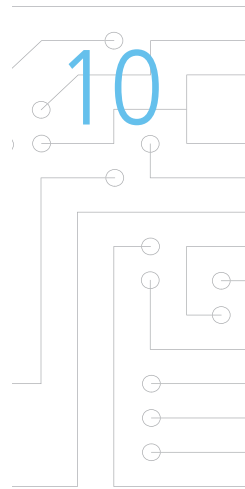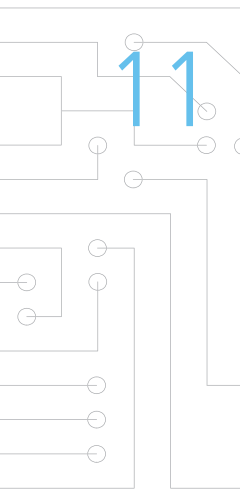
11. ACCOMMODATION AND RESOURCES

11.1   The accommodation and resources for ICT are good or better in 19% of schools and satisfactory in around 62%.   In the remaining schools, the weaknesses in accommodation and resources outweigh the strengths, with poor accommodation and ICT resources in 11% of them.   The quality, range and distribution of ICT infrastructure in schools have improved significantly in recent years, and most schools are resourced adequately.

11.2   In all schools, mostly through the implementation of C2k, there has been good progress in the provision of equipment, curriculum software and content, management information system and effective technical support.   All schools have benefited from a secure, reliable network infrastructure, which is widely available throughout the school, and well supported.

11.3   There is clear evidence, from the school visits and questionnaire returns, that the schools are positive about many aspects of the C2k managed service, including:

- the quality and reliability of the equipment and network infrastructure;

- the support and advice from the managed service partner providers;

- the very useful SIMS modules underpinning school administration and measurement of performance; and

- improved access by teachers and pupils to ICT resources and electronic materials, in particular the ease with which materials can be shared.

11.4   While almost all schools are satisfied (68%) or very satisfied (23%) with the C2k managed service solution, they did raise some areas of discontent, which include:

- the range, quality and modern currency of some of the software and content;

- the perceived limited functionality of LNI, including provision of access to community users and the inability to access some file types;

- the stringent security measures, which restrict the pupils' and teachers' access to many websites, resulting in significant frustration;

- the expensive catalogue prices and the cost of integrating legacy equipment; and

- the need for an increased allocation of storage space for teachers' and pupils' files.

11.5 Since 2002, the average ratio of pupils to computers has improved significantly from 6:1 to around 4:1. The ratio of pupils to computers in the schools ranges from 1:1 to 7:1. Just over 60% of the computers used in the schools were provided by the C2k managed service. The majority of schools are operating a legacy network in parallel with the C2k network. Only 20% of the legacy computers have been fully integrated to the C2k managed service. The operation of dual networks is a challenge for the schools and they report several key issues, including:

- the sustainability of the legacy networks and equipment, many of which are more than three years old;

- the resourcing of technical support; and

- the lack of coherence for the pupils and teachers, with dual log-ins and the inconvenience around the transfer of data files between the systems.

11.6 The sustainability of legacy equipment is a major issue for many schools. While there is broad awareness among school leaders and senior managers of sustainability issues, this is rarely translated into effective resource planning, including the need for increased debate, around the clear advantages of the integration of legacy systems to the C2k managed service.

11.7 It is noteworthy that the majority of principals from the schools which integrated legacy networks fully into the C2K managed service used this as an opportunity to review and restructure the management arrangements for ICT across the school. The deployment of teachers as network managers, for example, was no longer necessary and many of the schools were able to broaden the role of ICT technical staff to include more support and training for teachers. In these schools, the principals report that a more open and collegial approach to ICT has evolved and there is an improved sense of ownership of ICT resources throughout the school.

11.8 Approximately 40% of all C2k computers have been distributed to classrooms, and the majority of classrooms now have a computer. While the availability of whole-class presentational technologies such as digital projectors and electronic
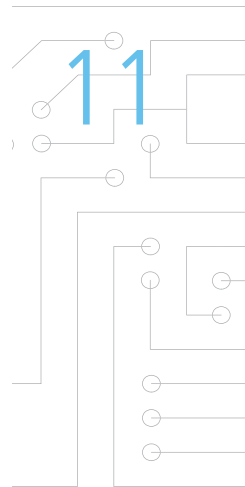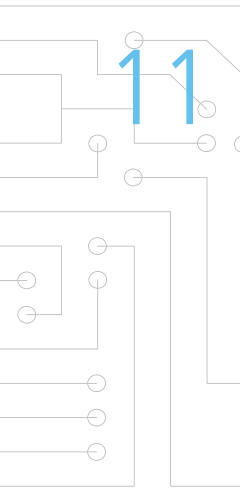
whiteboards has become more widespread, in most cases, the classroom computers are not connected to presentation equipment, and they are used mainly for administration purposes by the teacher. At present, around one in every four classroom-based computers is connected to a digital projector or electronic whiteboard, which is inadequate. As a result, the many opportunities to enliven lessons and motivate pupils through the full use of the range of multimedia effects and stimuli are not realised sufficiently, and the potential of the classroom-based computers is not being exploited as fully as possible. The ratio of digital projectors to pupils ranges widely from 1:13 to 1:256, with an average of one digital projector for every 47 pupils. (Figure 4)

11.9   Around 44% of all computers are centralised in computer suites. In addition, most school libraries have a resource centre equipped with a cluster of computers. 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, lighting and trunking for electrical and data cables. The teachers and pupils would benefit, however, from improved layout of computer suites.

Figure 4

Number of Digital Projectors

Number of digital projectors
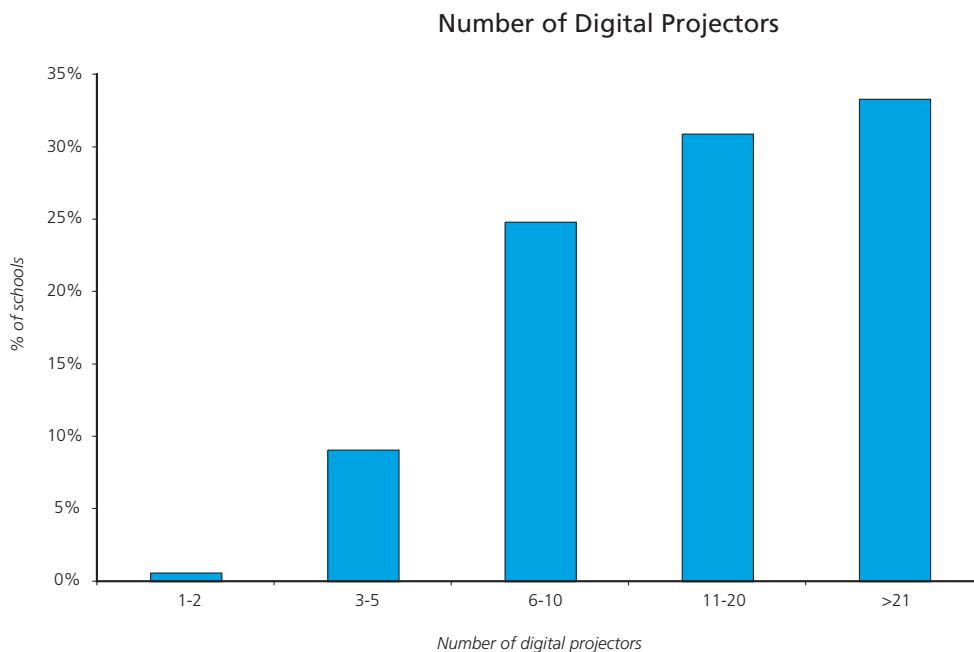
11.10   In a significant minority of computer suites, the teachers have inadequate room to circulate easily and often, insufficient access to all of the pupils' workstations. In the majority of computer suites, there is insufficient space for the pupils to undertake paper-based planning, design or small group work away from the computers. Over 42% of all computers are over three years old; as a result, in a minority of schools, the pupils and teachers are constrained by outdated hardware and software. In addition, in many schools the computer suites are equipped with too many computers and are often cramped and poorly ventilated.

11.11   In around one-half of the schools visited, the computers were over-centralised in computer suites; examination classes had priority of access. In a significant minority of the schools, there is a lack of subject clusters of computers, which constrains significantly the development and embedding of ICT across the curriculum. In the best practice, in around one-third of the schools, the staff had achieved an appropriate balance between the deployment of computers in suites for whole-class access and examination work, and a significant number of subject-based clusters. The clusters facilitate the ready and often spontaneous access to computers for pupils, working individually or in small groups, to undertake a broad range of ICT-related activities to support and extend subject work. The use of ICT is a much more routine part of teaching and learning in rooms which are equipped with, or close to, a subject cluster. (Figure 5)
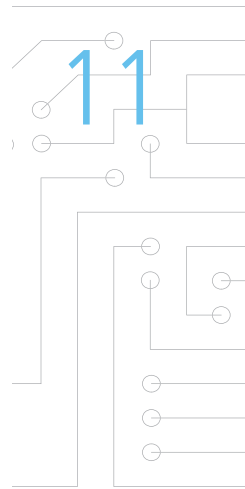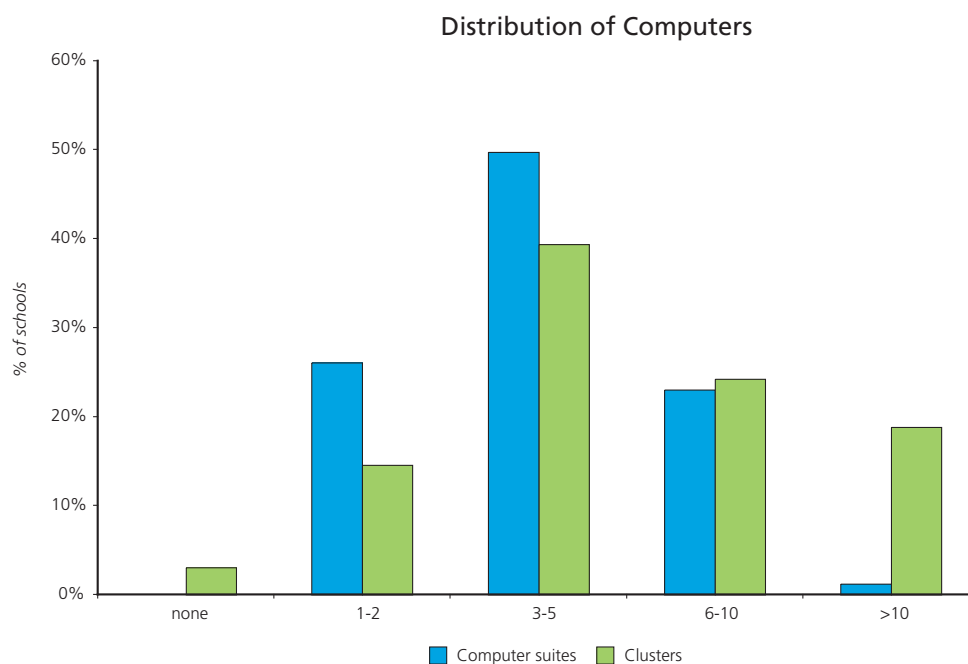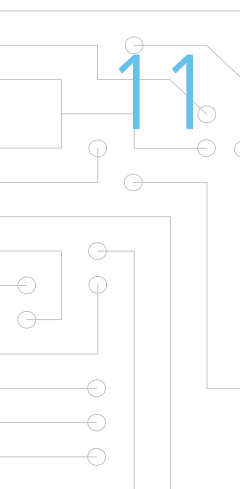
Figure 5

Distribution of Computers

11.12   All schools have broadband access to the Internet, currently running at 2Mbps.   A significant minority of the schools report slow access speeds at peak times, or when large groups undertake research activities at the same time. As yet, the pupils in only a small number of schools are using applications which require significant bandwidth availability. There is a need for C2k to increase the bandwidth provided to schools, particularly as the use of LNI becomes more widespread.

11.13   Around two-thirds have a school website, and 97% of them have an acceptable use policy for the Internet as a safeguard against inappropriate use. The teachers in a significant minority of the schools expressed frustrations at the filtering procedures employed by C2k, and report that pupils were often excluded from important and useful websites.

11.14   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, and this is becoming more of a challenge as the number of pupils undertaking specialist ICT courses at KS4 and post-16 continues to expand. Subject teachers in over one-half of the schools find access to computer suites and other ICT resources difficult and rarely flexible; this undermines their enthusiasm to embed ICT into planning and teaching.

11.15   The majority of the schools provide good access for pupils to computers and the Internet, through using the school library or through other open access arrangements. In these schools, access to computers is flexible and widely available outside school hours. The potential of the school library, or other ICT open access areas, as a central ICT resource area is under-exploited. Less than 3% of all computers in post-primary schools are located in the school library or ICT open access area. Only 2% of computers are located in sixth-form areas.

11.16   In most schools, there has been inadequate investment in portable technology for the flexible deployment of computers. Fewer than 15% of all computers are portable, and around 62% of these are more than five years old and virtually obsolete. Only 7% of the schools make use of wireless enabled tablet PCs to support ICT activities. A few schools make good use of mobile sets of laptop computers, connected to the school network by wireless technology, to provide more flexible access for pupils and teachers to ICT. For the most part, these work well and the pupils adapt quickly to using a portable computer.

11.17   Since 2002, there has been a decline in the access for teachers to laptop computers. Although just over two-thirds of teachers have access to a laptop computer, the majority of these were distributed through the Connecting Teachers initiative as part of the early work of C2k, and are now obsolete. Many of the teachers report that this has hindered the further development of their personal ICT competence, reduced the use and impact of the C2k curriculum software bundle, and also had a restrictive effect on the embedding of ICT across the subject departments.

11.18   A small number of schools have provided notebook or laptop computers for teachers. The ready access to high specification notebook computers can enhance the confidence and motivation of teachers to use ICT. They are more aware of the potential of ICT to enhance teaching and learning and many of them prepare electronic teaching materials and resources of a high quality; these can be shared across a school intranet or virtual learning environment.

11.19   Around 18% of the schools have access to videoconferencing facilities. With the exception of work related to the Dissolving Boundaries project which links schools north and south for shared project work through videoconferencing, these facilities are largely underused.   Instances of new technology being used to facilitate collaborative links between schools and other schools or institutions are rare, and in almost all schools, under-exploited.

11.20   Just less than 25% of the schools facilitate access to ICT equipment by the local community, with school leaders expressing concerns over security, staff costs and child protection issues. At present, only a few schools lend computer equipment for pupils' use at home. In the design or refurbishment of post-primary schools, consideration needs to be given to the provision of a spacious, flexible open access area, resourced with high specification equipment and which has adequate facilities to support use by pupils and the local community.
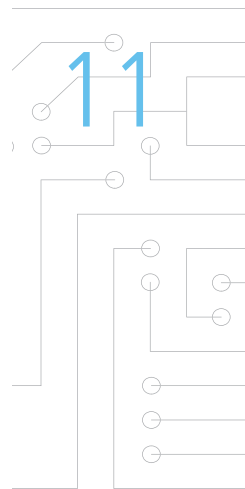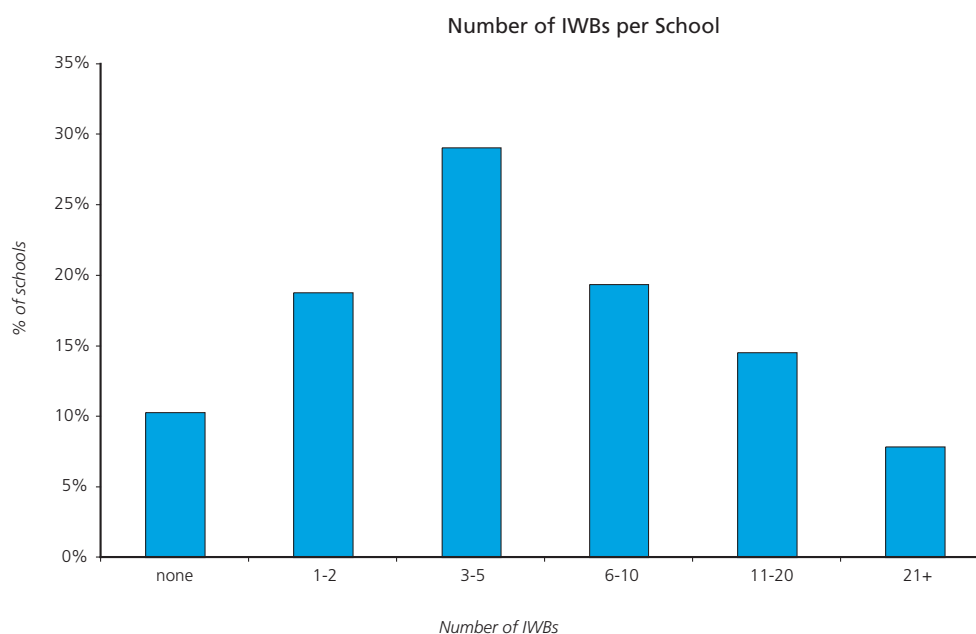
Figure 6

Number of IWBs per School

Number of IWBs

11.21   Since 2001, there has been a noticeable increase in the number of digital projectors and interactive electronic whiteboards in schools, and to a lesser extent, facilities and equipment for recording and editing digital video. Over 90% of schools have invested in at least one interactive whiteboard, with around 26% of them reporting provision of ten or more. (Figure 6)

11.22   While most schools report that they have a school intranet or some other method of storing and sharing electronic materials in place, many of these are poorly organised and under-developed; they are used effectively to support learning in only a minority of schools (Figure 7). It is clear that schools are at an early stage with developing whole-school intranets, providing remote access to files and learning materials for pupils, and integrating a VLE into the teaching and learning process.

Figure 7
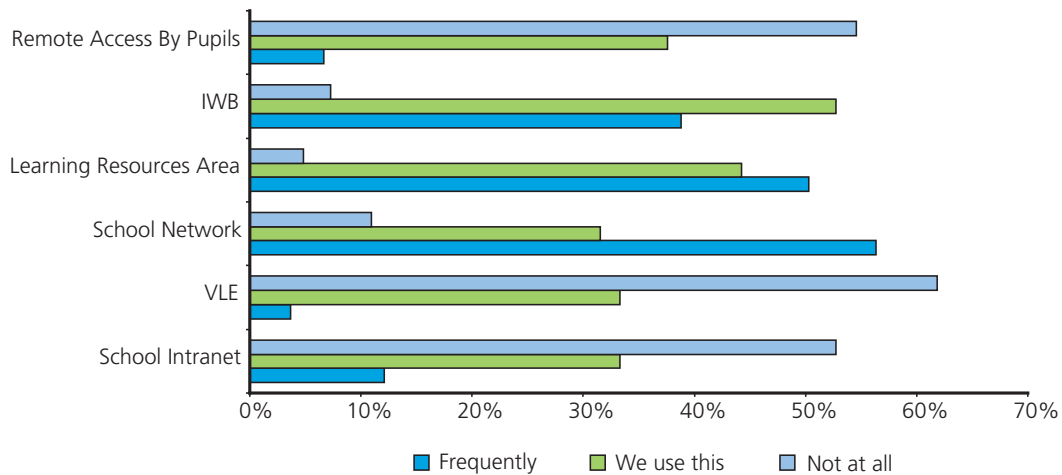
11.23   The better intranets or shared areas inspected, provide pupils with flexible access to school noticeboards, subject learning materials, teacher notes and multimedia presentations, coursework guidance, subject extension activities, materials to support revision and links to relevant websites. In most of these schools, the pupils value the opportunities they have to access the intranet outside of class time or remotely. In the better practice, the school leaders use the intranet effectively with staff, to disseminate good practice, show examples of pupils' work, and publish whole-school and subject planning documents. Important school and pupil performance data is shared effectively with the staff. In most schools, the level of technical support for teachers to develop and refine on-line learning materials, suitable for placement in an electronic repository, is inadequate.

11.24   Most schools employ a specialist ICT technician on a full-time basis; the quality of technical support is mostly good or better. In around one-third of the schools, the classroom teachers benefit from good technician support, particularly when they bring large groups of pupils to the computer suite. 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.
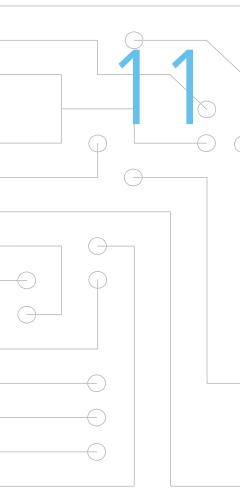
11.25   A few schools, in particular those which have integrated legacy computers fully to the C2k managed service, have reviewed the role of the technician and revisited their duties to good effect. In these schools, the technicians are developing the school intranet and website, supporting classroom teachers and often providing a range of staff development activities such as designing interactive learning materials and multimedia presentations.

12. SCHOOL EVALUATIONS OF ICT PROVISION

12.1   The development of a culture of review and rigorous self-evaluation of the effectiveness of the provision for ICT continues to be an important area for development for almost all schools.

12.2   In the online questionnaire sent to the schools, members of senior management were asked to evaluate ICT provision within the school, including their evaluation of the C2k managed service solution. The findings of the self-evaluations completed by the schools are below:

C2k Managed Service

- Almost all schools are satisfied (68%) or very satisfied (23%) with the C2k managed service solution;

- most schools are satisfied (76%) or very satisfied (11%) with the impact of the C2k managed service solution on teaching and learning;

- just over 52% of schools report that staff have little awareness of the functionality and potential of LNI to enhance pupils' learning; 41% report staff are quite aware with 5% reporting they are fully aware of the functionality and potential of LNI;

- the schools report good or better levels of satisfaction with the quality of C2k equipment (93%) and the reliability of the equipment (95%);

- the schools are positive in their responses on the SIMS modules to support administration (92%);

- around 94% of the schools rate the support from Northgate to be good, with 85% responding positively about the managed service helpdesk; (Figure 8)
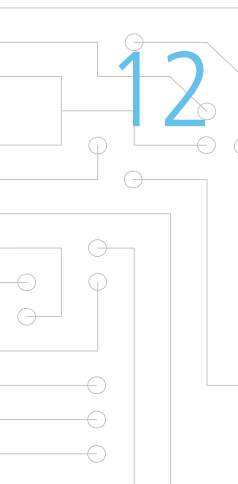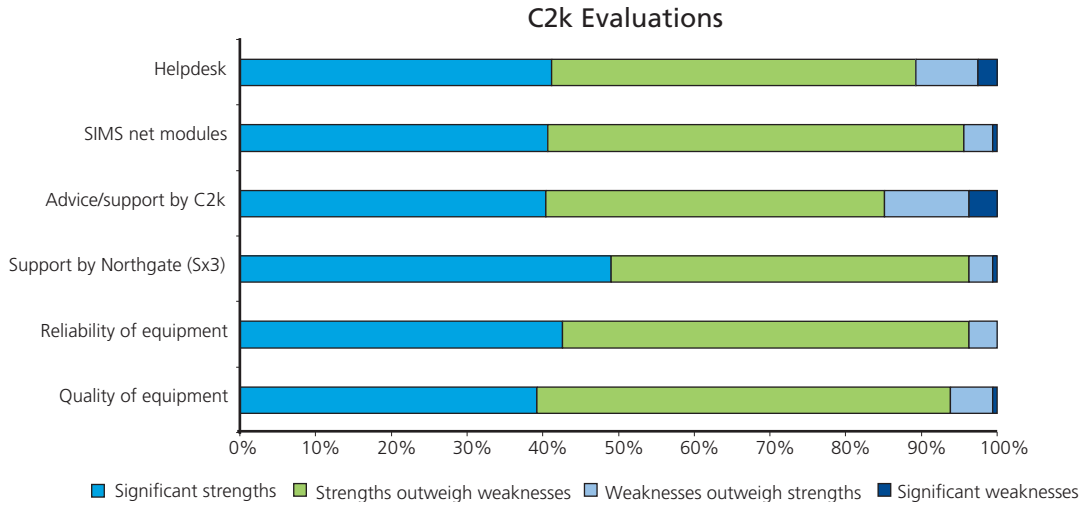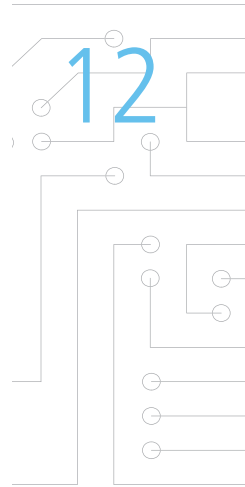
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Figure 8

C2k Evaluations
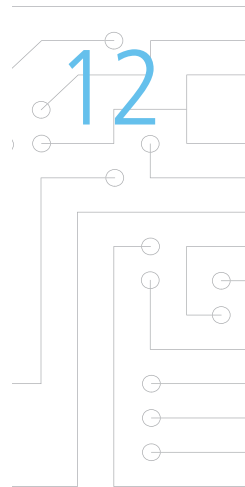
- almost two-thirds of the schools are dissatisfied with the catalogue prices of the managed service; (Figure 9)

- around 42% of the schools reported concerns with the range and quality of the curriculum software supplied with the managed service; and

- over one-half of the schools indicated dissatisfaction with the amount of storage space allocated to the staff and pupils.

Figure 9

C2k Evaluations
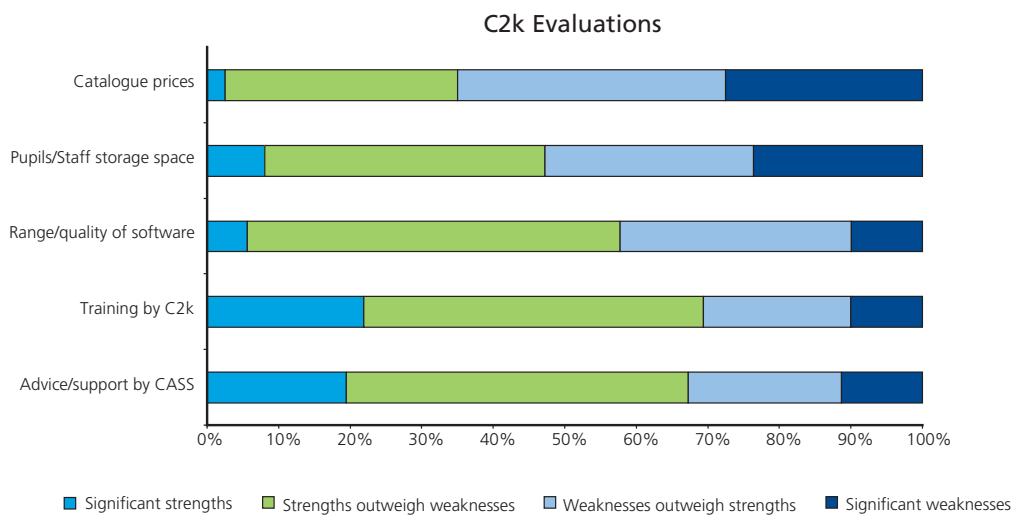
Schools

- the integration of ICT into the school development plan is well-developed, with 65% indicating strong integration of ICT;

- subject departments in 33% of the schools have integrated ICT fully into planning for teaching and learning, with the majority of them (62%) indicating some integration of ICT into subject planning;

- around 30% of the schools indicate they take little account of pupils' existing ICT competences on entry to year 8. A further 52% take some account with only 18% taking significant account of pupils' prior experiences and achievements;

- ICT is used well to support pupils with special educational needs in 32% of the schools;

- only 18% of the schools indicate that good use is made of ICT to support work in literacy and numeracy;

- almost 77% of the schools report that the pupils have good or excellent access to ICT resources outside of school hours;

- only 12% of the schools report that the pupils' ICT experiences are closely monitored by senior management;

- the senior managers in 67% of the schools make good use of the SIMS.net modules to support and inform the management of the school;

- around 12% of the schools make significant use of CASS to support ICT developments, a further 38% report some use of CASS to support work in ICT. In contrast, 50% of the schools report little or no use of CASS to support ICT work; and

- since 2002, the schools have indicated an improved picture of the integration of ICT into subjects at KS3. There remains, however, considerable variation in the integration of ICT into subject work at KS3 (Figure 10), with substantial integration reported in discrete ICT lessons, technology and design and business studies; in contrast, the integration of ICT is reported by schools to be weakest in physical education, religious education, music and modern languages.
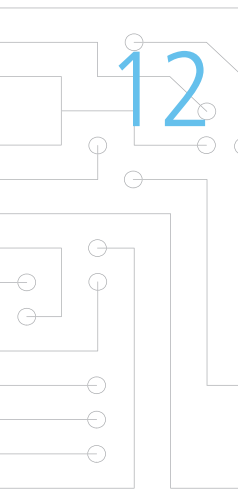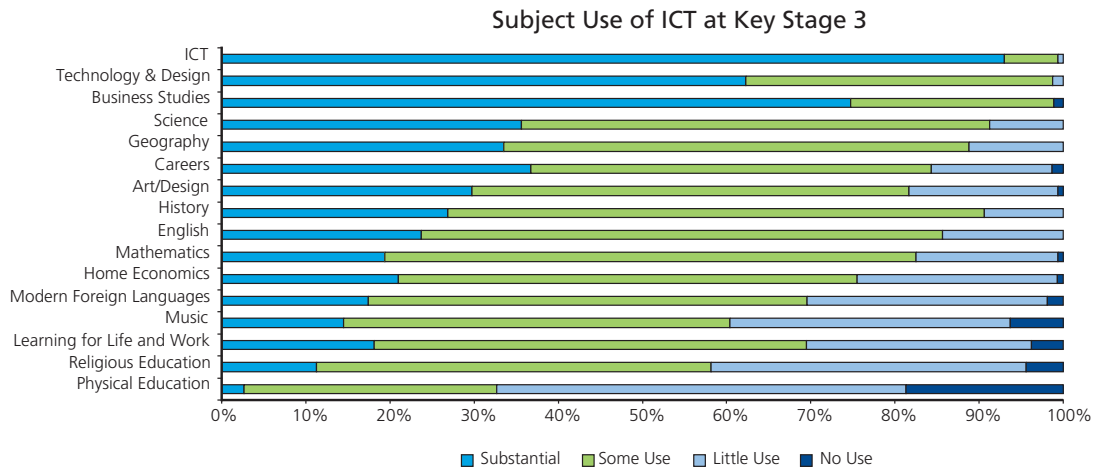
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Figure 10

Subject Use of ICT at Key Stage 3

Legend: Substantial · Some Use · Little Use · No Use

Categories (top to bottom): ICT, Technology & Design, Business Studies, Science, Geography, Careers, Art/Design, History, English, Mathematics, Home Economics, Modern Foreign Languages, Music, Learning for Life and Work, Religious Education, Physical Education

13.   CONCLUSION

13.1   Almost all schools recognise the importance of ICT as an essential tool for learning, and its potential to enhance and enrich the way young people learn. Significant funds have been invested by the Government in the development of ICT in schools and the positive impact of the continued investment is most noticeable in the good quality ICT infrastructure across the schools.

13.2   There is clear evidence that the ICT competence of young people is increasing and that effective embedding of ICT can and does lead to higher levels of participation in lessons and improved quality of work. The quality of teaching using ICT continues to improve gradually. Nevertheless, the most recent inspection findings reveal emphatically that only a minority of the post-primary schools have embedded ICT effectively to enhance and extend pupils' learning, across a sufficiently wide range of curriculum areas, and the potential of the new technologies remains under-exploited.

13.3   The pace of the impact on teaching and learning of the large scale investment in the technological infrastructure has been too slow, and there has been a strategic deficit in providing the necessary continuing professional development of staff in the effective use of ICT in the classroom. In 2002, an ETI report on ICT in post-primary schools identified some key areas for improvement in order to strengthen the quality of ICT provision and to raise the pupils' standards of achievement. A number of the recommendations of the previous report have not yet been addressed adequately. In most schools, ICT is not yet integrated routinely into teaching and learning and its impact as a driver for school improvement and raised standards is not adequately exploited.

13.4   The entire education system in NI, at all levels, is undergoing a process of very significant change. The review of the NI curriculum has focused much attention on the need for our young people to develop many essential skills and capabilities. ICT has a key role to play in developing and supporting young people as self-assured and independent learners, who can understand and apply new technology with confidence. There is an onus on DE, in collaboration with the range of key stakeholders, to revisit the various strands of the strategy for the development of ICT, and to refocus on a more consistent and effective approach across the schools in ensuring that pupils access and use ICT as an important aspect of their learning. It is also essential that the learning needs of teachers in this regard are given a much higher priority.
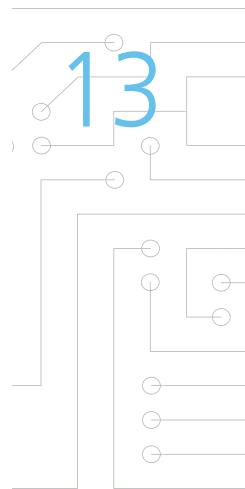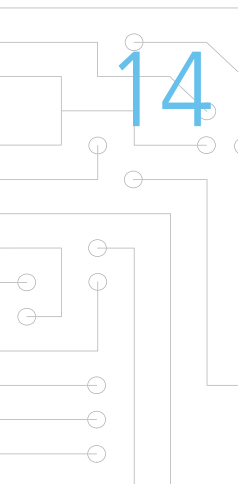
14. RECOMMENDATIONS

Schools

In order further to embed ICT, school principals and senior managers need to:

- set clear expectations, and provide well-informed and firm leadership, for a systematic and robust process of self-evaluation of the work of the school, including ICT;

- develop and promote a clear and realistic vision for the use of ICT across the curriculum;

- undertake a baseline audit of the current stage of development of ICT across the curriculum, involving pupils, staff and parents;

- develop a collegial approach to the further embedding of ICT, based on a sharing and dissemination of existing good practice within and outside of school, and an investment in time for teachers to explore, experiment with, and reflect on the necessary pedagogy;

- monitor, review and evaluate the progress that pupils make in applying ICT and the impact of it on the standards of their work;

- establish realistic targets for subject department contributions to a coherent and progressive development of the pupils' ICT skills;

- provide better access for staff to ICT resources, with particular consideration given to the flexible deployment of wireless-connected portable devices;

- make more effective use of the ICT infrastructure and resources provided; and

- provide pupils with better opportunities to develop and apply progressive ICT skills, be creative and to take responsibility for their own learning.

Department of Education

For further progress at a strategic level, there is a need:

- for clarification of the roles and responsibilities of the various educational organisations involved, in relation to the promotion and implementation of a

firm, coherent ICT strategy, with consistent support for schools and teachers across NI;

- to revisit the emPowering Schools strategy in order to focus more strongly on the continuing professional development needs of teachers;

- to encourage schools further to adopt and apply the Becta SRF for ICT;

- to extend the criteria for the selection of specialist schools to include effective embedding of ICT as a required outcome;

- to give serious consideration to the provision of high-specification wireless laptops to teachers; and

- to develop further the strategic ICT leadership skills of the principals and senior staff with responsibility for ICT.

C2k

There is a need:

- for improved communication with schools and other important stakeholders regarding the potential of LNI, and urgent action to remedy any lack of functionality in key aspects of its use by teachers;

- for updated software and subject content, along with significantly improved bandwidth; and

- to encourage and promote the use of LNI to underpin the implementation of the revised curriculum and associated staff development, and other major strategic initiatives.
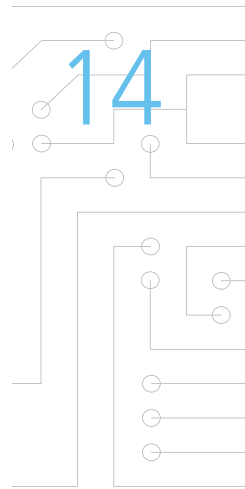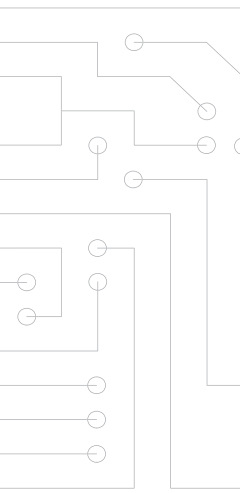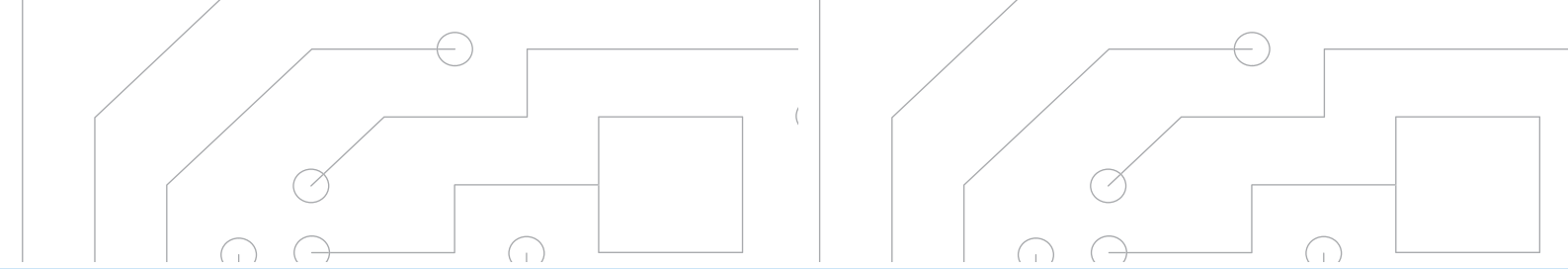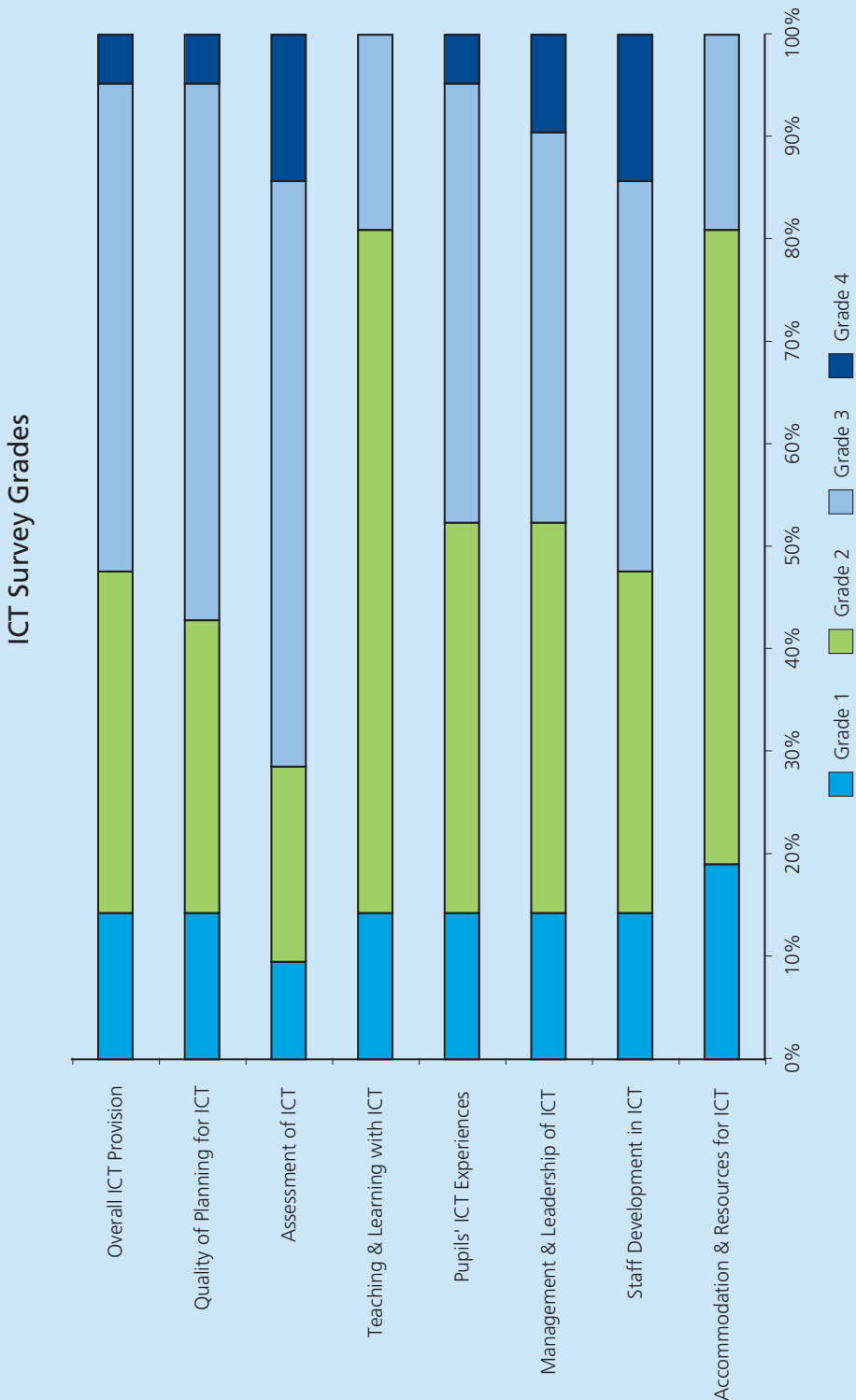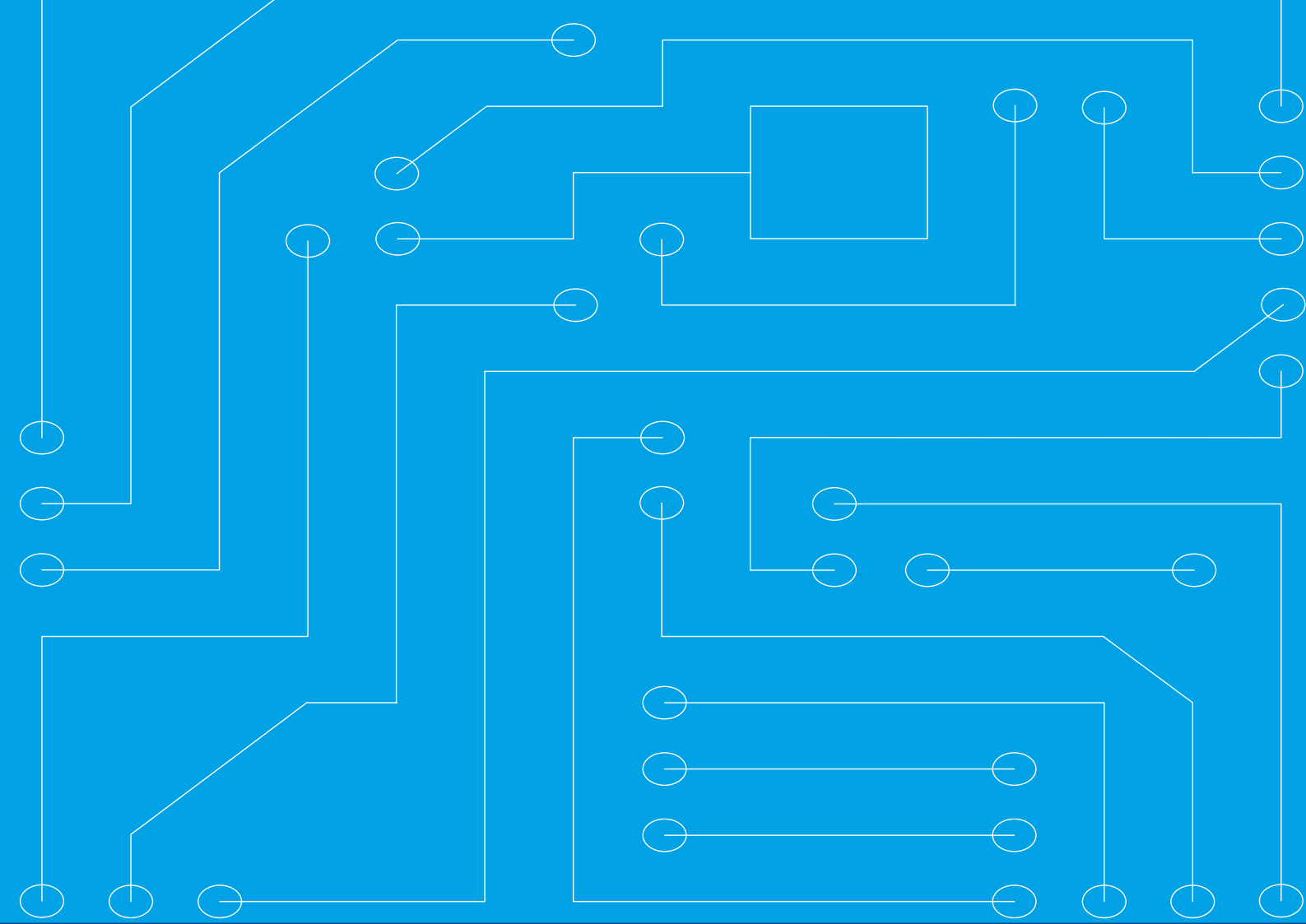
SCHOOLS INVOLVED IN THE INSPECTION

Belfast Boys' Model School

Bloomfield Collegiate, Belfast

Clounagh Junior High School, Portadown

Dalriada School, Ballymoney

Fivemiletown High School

Fort Hill College, Lisburn

Friends' School, Lisburn

Garvagh High School

Glengormley High School

Loreto Grammar, Omagh

Oakgrove Integrated College, Londonderry

Our Lady's Grammar School, Newry

St Brigid's College, Londonderry

St Colmcille's High School, Crossgar

St Joseph's College, Coleraine

St Malachy's High School, Castlewellan

St Patrick's Academy, Dungannon

St Patrick's College, Maghera

St Patrick's Grammar, Armagh

St Pius X High School, Magherafelt

The Royal School, Dungannon

Inspection Grades

ICT Survey Grades

Grade 1 Grade 2 Grade 3 Grade 4

Overall ICT Provision
Quality of Planning for ICT
Assessment of ICT
Teaching & Learning with ICT
Pupils' ICT Experiences
Management & Leadership of ICT
Staff Development in ICT
Accommodation & Resources for ICT

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%