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Secondary Subject Reports 2000/01:

Information and communication technology

HMI 382

A report from Her Majesty's Chief Inspector of Schools in England

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Main findings

- Pupils' achievement in information and communication technology (ICT) continues to improve. The provision of discrete courses at Key Stage 3 and of examination courses at Key Stage 4 has had a significant impact on achievement, while improved levels of resources have also been an important factor. Even so, ICT lags behind other subjects, and achievement is unsatisfactory in one in four schools in Key Stage 3 and nearly one in three at Key Stage 4.

- ICT is the fastest growing subject at GCSE, with an increase in entries in 2001 that was five times the overall increase. Over half of pupils entered attained higher grades, but with a six percentage point difference between girls and boys.*

- The proportion of students gaining grades A and B in GCE A-level Computer Studies was 22.8 per cent, little changed from previous years. However the overall entry was 15 per cent higher than the previous year.

- The teaching of ICT is the most improved of all subjects, especially in relation to teachers' knowledge and understanding, lesson planning and the teaching methods used; teaching is at least satisfactory in all but a few schools.

- Teachers' assessment of pupils' performance at the end of Key Stage 3 is inconsistent. There is insufficient moderation within and between schools and the range of assessment techniques used is too narrow.

- Pupils are generally motivated by ICT and many acquire, or are able to reinforce, skills, knowledge and understanding through its use at home, or at school outside timetabled lessons.

- Despite improvements since last year, three schools in ten at Key Stage 3 and nearly half at Key Stage 4 do not meet statutory requirements for the subject.

- The application of ICT in other subjects is making slow progress, often because teachers find it hard to gain access to ICT resources when they need them.

- Although there is clear and growing commitment to improve, there are continuing weaknesses in leadership and management of ICT at whole-school level. In particular, more detailed planning is needed in order to ensure that the intended use of ICT in other subjects is facilitated by appropriate and timely access to resources.

Unconfirmed data. The changes of Curriculum 2000 and in particular the introduction of Advanced Subsidiary courses make direct comparison with previous years impossible. Details of this year's provisional data can be found on DfES Statistical First Release SFR45/2001, at www.dfes.gov.uk/statistics/DB/SFR/

Information and communication technology overview and trends, 2000/01

Standards in ICT continue to improve. Many pupils in Key Stage 3 are becoming independent and confident users of ICT, with their skills often reinforced through constructive use of ICT at home. The most confident are willing to experiment with new software and can transfer their knowledge of one software package to another. They are able to use the Internet for a variety of purposes, including research and enhancing the appearance of their work. Pupils are also increasingly taking on the role of web publisher. In one school, for example, Year 8 pupils designed their own web pages for the school intranet and linked them to other pages. In others, teachers and pupils are working together on the development of website pages.

By the end of Year 9, most pupils can create and amend text effectively. Higher attainers create sophisticated printed products and screen-based presentations for different purposes and audiences. For example, Year 8 pupils designing a weather report using PowerPoint were greatly motivated by the opportunity to demonstrate their finished presentations. The ability to use presentation software in this way is often developed in other subjects such as English, where proper consideration of audience and visual impact is given. Pupils learn to set up and carry out searches of data files, of varying complexity, although access to large files in order to appreciate the power of databases is limited. Less frequently, they plan and edit programs of instructions for controlling events and discuss effectively the impact of ICT on society and the individual.

However, there remain some important areas of weakness:

- while many pupils are able to search the Internet competently, they are less skilled at narrowing down searches for the information they seek and at adapting what they retrieve for their own purposes;

- in ICT lessons, there is often too little consideration of the overall design of products, and some pupils make design decisions without thinking them through sufficiently;

- in the use of word processing, opportunities for sustained text creation on screen are often limited, with software used simply to type up hand-written notes;

- opportunities to use computers to control events and to log data in science experiments are often limited or non-existent and these are the weakest areas of pupils' achievements;

- some pupils, particularly lower attainers, have difficulty in working independently. In one Year 9 class, for example, pupils were using computers to construct pie charts from a set of data provided by the teacher in the form of a spreadsheet. Although the lesson was well planned and supported by a high quality handout, most pupils had to be very closely directed in order to make satisfactory progress with the tasks set.

Pupils who follow **examination courses in Key Stage 4** are more likely to attain high standards, for example in designing, implementing and evaluating systems for others to use. They can select and use appropriate software for particular purposes, giving clear and logical explanations for their choice. They become used to making decisions about how to solve problems. Pupils take care over the presentation of their work and provide detailed annotations to show how it has developed and to demonstrate their understanding. This practice ensures that they make progress when aspects are revisited and helps them to revise more effectively for examinations.

GNVQ courses have contributed significantly to pupils' IT capability. Pupils often show good evidence of research skills, the ability to select and combine information from various sources and good evaluation skills. They build on the skills gained during Key Stage 3 and many produce a wide range of work, much of it well researched. For example, one group set up a database of school library books, which they were able to search fluently. There has also been some growth in the use of Key Skills courses in Key Stage 4. Pupils following such programmes generally make at least adequate progress in building on what they learnt in Key Stage 3.

Where pupils do not follow discrete ICT courses in Key Stage 4, they usually make unsatisfactory progress. Principally this is because experiences are inadequately planned and pupils tend only to use their existing skills, knowledge and understanding, rather than build upon them.

Effective teachers establish a learning culture where pupils are expected to **work autonomously and independently,** by being mutually supportive and readily sharing their skills and knowledge. In one school, for example, pupils needing specific technical help were required to seek this from another pupil before asking the teacher. This freed the teacher to concentrate on helping pupils with their work on the design of web pages. In another school this support was planned into lessons:

> *The department operates a 'buddy' system. Boys and girls are seated alternately and, wherever possible, higher and lower attainers are together. This means they are able to ask their partners if they have a problem, reducing demands on the teachers and, again, aiding progress.*

It is a matter of particular difficulty for teachers of ICT that the computer, not the teacher, is the focal point of pupils' attention, and that much teaching is dispersed to give support to individuals or pairs of pupils. Good ICT teachers know the place of **whole class teaching** and how to manage a class of pupils easily distracted by the proximity of the keyboard. This includes good **demonstrations**, which show pupils what is expected of them, explanation of the **technical language of the subject** and encouragement of pupils to use it correctly. The use of digital projectors is growing rapidly and has greatly enhanced the quality of teachers' demonstrations, for example in introducing the uses of new software or pointing out important design features of a website. A whole class plenary session at the end of the lesson is also important, especially where new skills are being learned or where pupils can review each other's work.

Well-produced task sheets and guides often reinforce clear instructions by the teacher. In some schools, course booklets are devised so that pupils can work out for themselves the next steps, but also allowing higher-attaining pupils to be creative in using their own strategies. Where explanations of how to use software tools are also consigned to supporting materials, this allows the questioning of pupils to focus on the task in hand, for example the design and structure of a spreadsheet.

Close **monitoring** of work during the lessons is another feature of the best teaching, with teachers using well-targeted questions to check and extend understanding. Such teacher – pupil interaction is important.

> *Pupils are challenged in lessons, and they work in an environment of high expectations. Success is always rewarded, and failure is used to make individual suggestions that act as learning targets. Question and answer sessions are used to reinforce previous learning, assess pupils' understanding and extend thinking about the implications of what they are learning.*

Where pupils work in small groups, this can encourage greater **experimentation** and exploration of the software. One very good Year 7 lesson, for example, involved pupils in gathering the information required to produce a newspaper article. Pupils in smaller groups discussed the intended audience and what they would be interested in reading. Representatives of each of the groups fed back their findings to the rest of the class.

The teaching of pupils with **SEN** is generally a weakness and more thought is needed to provide differentiated tasks and more easily understood supporting materials. The best teaching occurs where the pupils are set appropriate work based upon good awareness of their individual needs, and with the sensitive use of extra support. Where this happens, pupils gain confidence through success and are inspired to further effort by the high quality presentation that can be achieved using a computer.

> *Pupils with special educational needs are considered fully in the planning of work. Those who have statements of special need receive very good support from classroom assistants. These pupils are enabled to be as independent as possible; teachers and helpers ensure that they can study and contribute their own ideas.*

The use of **homework** to extend and enrich pupils' learning is improving. This is most effective where it is regularly set, constructively marked and related to the lesson topic. Homework may require the use of ICT where the pupils can gain easy access to resources out of lessons. Often it relates to the place of technology in society and incorporates extension work for higher attainers. Where pupils do not have access to a computer at home, schools are increasingly making their ICT resources available out of school hours. Many pupils make good use of this opportunity to complete homework or coursework projects, or to work on extra assignments such as the school website or newspaper. Such activities invariably contribute to improved achievement.

The OFSTED Subject Report 1999/2000 raised the following issues that some schools should continue to address:

- resolving problems arising from ICT development;
- varying teaching styles and materials;
- learning from information sources.

Issues in secondary Information and Communications Technology 2000/01

Improved development planning

Schools generally demonstrate a clear commitment to raising standards in ICT and the ICT development plans written to obtain National Grid for Learning funding generally cover the important areas of curriculum, resources and staff development. These plans are usually clear and focus on raising attainment. However, they often lack a sufficiently strategic approach, a vision of what intended developments mean for pupils, and the necessary level of detail required to ensure that intentions are realised.

Good plans go beyond outlining course provision and provide a flavour of what pupils' ICT experiences will be like in a few years' time. One school, for example, outlined a day in the life of a Year 10 pupil in 2004 and her use of ICT in different lessons. This provided a concise picture of what the school was striving to achieve. Another feature of good planning is coherence between the different elements of the plan. For example, where there is provision of ICT training for teachers in subjects across the curriculum, this needs to be linked to ensuring they have access to ICT resources, in order to consolidate the training by the use of ICT in lessons.

The deployment of resources is critical, and senior management teams need to give more consideration to the relationship between this and the ICT curriculum. For example, many schools are supplementing their computer rooms with clusters of machines strategically sited around the school, increasingly using sets of laptops with wireless links to the school network to provide greater flexibility. Open access in learning resource centres and around the school is increasingly important as pupils exercise their independence and use ICT to complete assignments and homework in a range of subjects:

> *The development of the syllabus has gone hand in hand with the development of the resources and both are good; they enable all the subjects to have access to good quality tools to enhance teaching and learning across the curriculum. The Key Stage 3 ICT lessons ensure that the National Curriculum programmes of study are covered, as well as providing the expertise of specialist teachers*

and skilled technicians. The open access and placement of computer workstations around the school and in the learning resource centre enables students to explore the Internet, complete assignments or do their homework. The English, science, history and design and technology departments all make particularly good use of ICT.

Planning for application of ICT across the curriculum

Where ICT is taught through discrete courses there has generally been an improvement in ICT teaching and learning. However, where schools continue to develop the application of ICT only through other subjects, pupils' progress is generally much slower. In the relatively small number of schools that have succeeded in making adequate or better provision through cross-curricular use of ICT, there is an unusually high level of staff competence across departments, together with detailed planning and effective monitoring. For example, one school made successful provision at Key Stage 4 through the subjects that were compulsory for all of its pupils: English, mathematics science and design and technology. The ICT components of these subjects were carefully monitored to ensure that pupils were receiving their ICT entitlement. More often, the purely cross-curricular approach to ICT provision fails to work effectively. This is often because of inadequate curriculum planning at whole school level, linked to less than optimum use of the computer rooms available in the school.

Demand for ICT resources is growing and generally outstrips supply, even with the rapid expansion in recent years. However, many schools continue to find it difficult to ensure a consistent approach to the use of ICT within a particular subject, mainly owing to a lack of adequate training for all of the staff concerned. Furthermore, as the new curriculum requirements for ICT are often not being met in other subjects, it is unlikely that they could also discharge a responsibility for developing pupils' ICT capability.

The ICT strand of the Key Stage 3 strategy will, from 2002, require discrete provision for ICT and schools will need to make decisions about the place of ICT in the curriculum. A balance needs to be achieved between the effective teaching of ICT in its own right, and the application of skills, knowledge and understanding across subjects. This is an important aspect of ICT capability, but one which should add value to teaching and learning.

Monitoring and assessment of pupils' performance

Schools need to address several important issues:

- the range of assessment techniques is restricted; pupils are insufficiently involved in their own assessment and often have too little understanding of what it is they are trying to achieve;
- there is insufficient ongoing assessment of their ICT capability;
- teacher assessment at the end of Key Stage 3 is often unmoderated.

In the minority of schools where the quality and use of assessment are good, just over one school in three, these problems have been successfully addressed. Teachers make a point of explaining lesson objectives to pupils and, where appropriate, the implications of level descriptors. This process is then complemented by marking and assessment that enable the students to know how well they are doing. Some schools have enhanced their assessment practice by requiring pupils to carry out guided self-assessment on their performance in each of the ICT activities that they undertake. Annotating their printouts helps pupils to focus on how they have used ICT to improve their work and the teacher to assess how much they have understood. At the end of the key stage, there is careful internal moderation, and at best schools have paired themselves with a neighbouring school to standardise their assessments.

> *Pupils' portfolios are full and well organised. Their annotations and explanations are extremely detailed, and show that they understand what they are doing. This practice ensures that they make progress when aspects are revisited and helps them to revise more effectively for examinations.*

A particular problem for the assessment of ICT in many schools is that the level of resources and accommodation causes pupils to have to work in pairs on computer tasks. While this may allow them to exercise and develop their ability to work with others, too often individual pupils take a passive role and do not develop sufficient independence. Some schools, however, adapt well to limited resources through effective lesson planning. For example, in one lesson half the class worked on a data protection exercise while the other half worked on computers, searching a hotel database for 'bad' customers. Planning of this kind enables teachers to assess more accurately pupils' ICT capability.