Information communication technology

Effective teaching develops pupils' information and communication technology (ICT) skills and helps them to apply these for specific purposes and improve the quality of their work. As a result pupils are involved in their own assessment and can articulate how they use ICT to improve their work. Good practical lessons achieve a balance between the use of ICT resources and work away from computers in order to plan, reflect and evaluate. They include plenaries, which enable the pupils to consider the progress they have made, and possibly to demonstrate to others what they have achieved. Where ICT or computing is taught as an examination subject, good teaching builds on pupils' existing experience of using computers and relates this to theoretical understanding and to the use of ICT in the world beyond school. Examination requirements are communicated to pupils in the context of specific tasks and coursework.

Good teachers of ICT are able to use their **subject knowledge** to provide clear explanations to pupils, providing good coverage of the underlying concepts and applying the correct technical vocabulary.

> *A Year 11 short course GCSE lesson involved a control system case study linked to examination requirements. The teacher provided a clear exposition of the purpose of the lesson and ensured a high level of engagement with the pupils through searching questioning. His high expectations were made explicit at the start of the lesson. The teacher used his good subject knowledge to give a strong emphasis on detail to enhance the pupils' knowledge and understanding. For example, his description of closed/open systems and flowcharts was detailed and pertinent. He identified relevant websites and pupils made effective use of these to gain information of the topic. Pupils quickly settled to work on ICT and were confident users, with well-developed skills evident in drawing flowcharts and diagrams. They had good knowledge of control applications and of the concepts of input, process, output and feedback. They used and understood the correct technical terms.*

Teachers' good subject knowledge also enables them to ensure that their **questioning of pupils**, both as a whole class and individually or in groups, elicits pupils' understanding (or reveals their misunderstanding), and provides a clear focus for the development of their work.

> *Year 8 pupils were extending their use of features of a computer graphics package. Pupils worked independently, showing good levels of concentration. They were keen to learn, to reinforce skills and explore new learning. They drafted their designs directly to screen, which were appropriate to the greeting card topic. Good intervention by the teacher enabled her to question pupils' design decisions, encouraging them to evaluate the quality of their own work. A plenary session at the end of the lesson enabled all pupils to look at and evaluate each other's designs and the teacher to draw out skilfully the criteria for such evaluation.*

In a Year 12 Advanced Vocational Certificate in Education course on advanced spreadsheet design, the teacher's questioning was thorough and probing. For example, rather than just accepting the students' first answers, he asked secondary questions which extended their thinking. This provoked a more developed discussion and helped develop the students' analytical skills.

Appropriate intervention by teachers is particularly important where pupils use on-line materials, such as those now being widely used for the General National Vocational Qualification (GNVQ) in ICT. Teachers need both to check pupils' understanding and ensure that they encounter a range of methodologies.

Year 10 GNVQ pupils made good use of on-line materials, working methodically through an exercise on the use of spreadsheets to present information in columns and tables and to employ formulae. Their progress, however, depended crucially on the teacher's effective monitoring of their progress and appropriate interventions to ensure they were developing their skills securely. The pupils clearly enjoyed this way of working and maintained very positive attitudes.

In another Year 10 lesson, using the same on-line resources, pupils explored a currency converter program as a spreadsheet application, answering questions about modelling. The teacher's intervention was again important – she used an interactive whiteboard to recap the work learnt, complementing the on-line work with good direct teaching.

In **well-planned lessons**, teachers ensure that pupils make good use of the time available, and are well occupied and absorbed in the task in hand. Pupils know at the outset what is being taught, what they have to do and how to finish. Lessons are pacy and have identifiable beginnings, middles and ends. The tasks set are challenging and interesting to pupils. Particularly successful tasks, such as the design of web pages, enable pupils to show flair and inventiveness.

In a good Year 7 lesson, pupils worked in small groups to develop pages for the school's website, based on work they had undertaken on a field trip. They searched the Internet for relevant images and used a variety of software with confidence. At the end of the lesson, each group spent a few minutes using the digital projector to demonstrate to the rest of the class what they had produced during the lesson.

Good ICT teaching achieves a balance between the **pupils' evaluation of outcomes and their understanding of the scope and nature of the application being learnt**. Pupils are provided with sufficient opportunities to reflect on and evaluate the quality of their work and to discuss evaluation criteria with others. Well-designed computer rooms aid good lesson planning in this respect, by providing space for work away from the computers.

A Year 11 GCSE class were set an effective desk-based practical task as part of a lesson on verification and validation, in which they identified the source of data errors and their consequences. They then worked through a practical task on buying gifts and completing an order form designed for computer entry. This was relevant to the pupils' experience. The teacher led a good discussion on double entry verification systems and had good subject knowledge.

Good **direct teaching** to the whole class is an effective teaching strategy for preparing pupils to develop their own skills. The timing of this approach is critical as teachers need to convey sufficient information without speaking for too long. The growing use of digital projectors and interactive whiteboards is improving the general quality of teachers' presentations and provides an opportunity for the teacher to act as a good role model in terms of quality. Pupils are generally well motivated by work with ICT and keen to try things for themselves, especially when the task demonstrates the power of the technology.

The teacher of a Year 10 ICT GCSE short course provided a very clear explanation of mail-merge, using an interactive whiteboard, and quickly identified the skills needed with the whole class before allowing them to prepare their own mail-merge. All pupils made improvements in their ability to use this application. They were then able to create business letters and personalise these for clients.

Pupils in Year 7 class were excited when they were shown how hundreds of letters could be created from one using a mail-merge facility. The teacher demonstrated this and the pupils tried for themselves. They reinforced the skill by producing their own mail-merge manual to help them remember how to do this.

The **ability to steadily refine and improve work** is central to ICT: due emphasis on the quality of outcomes, combined with the teaching of ICT skills, are often important features of good ICT teaching. Good teachers not only need to teach technical skills, knowledge and understanding, but also to enable pupils to reflect on and evaluate the outcomes of their work.

In a GCSE lesson on storyboarding Year 10 pupils prepared their multi-media presentation using pen and paper to create links and series between different sets of information on screen. Pupils evaluated their storyboards, first creating the evaluation criteria. Objectives for the lesson were made clear to the pupils. The teacher made very good use of pupils' four-block storyboards to look at what constituted good quality multi-media presentations. He provided a clear summary of this. Pupils made clear progress in understanding what makes good multi-media material, for example the use of "links" and "hot spots", as well as the importance of text, graphics and sound.

Teaching pupils to develop their work for a **particular audience and purpose** is particularly important and links between ICT and other subjects can be productive in this respect.

Year 7 pupils were taught how to use the features of presentation software in ICT lessons, but, when they applied this in English poetry work, they were able to develop their understanding of how best to use this medium as an effective means of communication.

It is important that teachers in other subjects provide appropriate opportunities for pupils to consolidate and extend their skills and understanding of ICT.

A Year 7 English lesson on the characters in a novel was taught in an ICT room. The teacher asked the pupils to think about how an author conveys to the reader what a character is like. The pupils then worked on the computers to write notes on their characters. The English content of the lesson stressed the development of ideas, while the ICT focus was on text editing. The teacher reminded the pupils how to move highlighted text and the pupils organised their notes into a logical order. This helpfully reinforced specific skills in a fresh context.

Good ICT teaching often includes some reflection on issues of **ICT in society** and the workplace, for example using the industrial and commercial experiences of ICT staff to ensure the relevance of tasks in Key Stage 4 to the world of work.

Year 11 GCSE pupils were revising the effects of ICT on society in preparation for their examination. Well-structured questions were designed to extend pupils' responses and demonstrate how to produce reasoned answers. Pupils debated a good range of moral and legal issues with conviction. They were well informed about techniques for the protection of data, for example passwords, and encryption. Frequent feedback to pupils, based on their responses to examination questions, extended their ideas and increased the complexity of possible answers through discussion.