Office for Standards in Education

Developing new vocational pathways

Final report on the introduction of new GCSEs

HMI 2051

Office for Standards in Education

Developing new vocational pathways

Final report on the introduction of new GCSEs

HMI 2051

July 2004

Document reference number: HMI 2051

To obtain an additional copy, contact:
Ofsted Publications Centre
Telephone: 07002 637833
Fax: 07002 693274
E-mail: freepublications@ofsted.gov.uk
Website: www.ofsted.gov.uk

Contents

Introduction

1. In September 2002, eight new General Certificate of Secondary Education (GCSE) courses in vocational subjects were introduced. The subjects are: applied art and design; applied business; engineering; health and social care; applied information and communication technology (ICT); leisure and tourism; manufacturing; and applied science. Some of these courses have been designed to cover the programmes of study of some subjects of the National Curriculum, though using different content to do so.

2. These new GCSEs were developed to capture the interest shown by many Key Stage 4 pupils in the world of work. They are intended to advance their knowledge, understanding and capability in specific yet broad vocational areas, together with their investigative, creative and business skills. Designed to have the same rigour and standards as other GCSE subjects, they encourage practical and work-related rather than theoretical types of learning. They are designated as 'double-award' courses and are worth the equivalent of two established GCSEs. This reflects the time required for pupils to learn actively within vocational settings; carry out research; undertake practical projects and case studies; and engage in role play, simulations and mini-enterprise activities. It is expected that pupils who complete the courses successfully will be able to progress onto higher level general or vocational courses in schools and colleges, or to modern apprenticeships.

3. In August 2003, Ofsted published its interim report on these new courses, *Developing new vocational pathways: interim report on the introduction of new GCSEs* (HMI 1630). This report identified some strengths but also important aspects that required attention. These included:

   - the provision of further training for teachers in assessment
   - the need to establish greater parity of esteem by making the new GCSEs available to a wider range of pupils
   - a stronger vocational dimension through links with employers
   - developing new GCSEs as part of a coherent vocational programme for pupils.

4. This report covers the introduction of these courses in schools during the period from September 2002 to April 2004. Her Majesty's Inspectors (HMI) and additional inspectors appointed by Ofsted visited 133 secondary schools. During these visits: discussions were held with key members of staff responsible for developing and teaching the new GCSEs; 195 lessons were observed – an average of just over 24 per subject; and discussions

were held with several pupils in Year 10 and Year 11 in each school following scrutiny of their work and progress. The inspectors also observed training sessions for teachers run by the three awarding bodies to help schools develop the new courses.

5. The government's Increased Flexibility Programme for Key Stage 4 was inspected by Ofsted at the same time as the inspection of the new GCSE courses. Data and information from this inspection are drawn upon in this report, especially where the partnerships between schools and colleges supported the development of the new GCSEs.

Main findings

6. The new GCSE courses have got off to a satisfactory start, with some high points and some low points. They are supporting the government's intentions to diversify the curriculum at Key Stage 4 and make it more vocationally relevant to pupils. There are grounds for optimism about the future of these courses providing that the issues highlighted in this report are dealt with effectively.

Pupils' achievement

- Pupils' achievement is satisfactory or better in three quarters of lessons and good or better in a third. It is, however, unsatisfactory in a quarter. This compares unfavourably with the average for all GCSE subjects at Key Stage 4.

- Although there are examples of high achievement in all subjects, there are considerable overall differences among them. Pupils' achievement is often good in engineering, and sometimes good in applied business. In applied science, achievement is higher than in the traditional double-award courses when the prior attainment of pupils is taken into account. In some schools where the target group for the new courses is mainly lower-attaining pupils, achievement is often unsatisfactory, especially in leisure and tourism.

- In most schools and subjects, the level of difficulty of the new GCSEs is similar to other more established GCSE courses of study. However, in a large minority of schools, the volume of work pupils do and the breadth and depth of their studies do not always add up to the weight of a double-award GCSE, especially (but not exclusively) in those schools where insufficient teaching time is allocated.

The quality of teaching

- The quality of teaching is satisfactory or better in nearly nine tenths of lessons, good or better in nearly a half, but unsatisfactory in a tenth. Again, these figures compare unfavourably with those for other GCSE subjects in Key Stage 4. They often reflect the unfamiliarity of many teachers with the new courses, and too frequently, the deployment of teachers to teach them without adequate or relevant preparation or qualifications.

- Teachers are coping well with the administration of assessment. Most, however, are unclear about important assessment requirements and lack confidence in being able to judge pupils' attainment against the criteria set by the awarding bodies. The course specifications are, in the main, clear, although some difficulties with particular courses are associated with a lack of clarity in the specifications.

Pupils' attitudes, behaviour and motivation

- Pupils' attitudes, behaviour and motivation are good or better in three fifths and satisfactory in nearly nine-tenths of lessons. In most schools, teachers rightly believe that the new GCSEs have improved pupils' behaviour in schools, including that of formerly difficult pupils. They often attribute this improvement in part to the relevance, practical activities, and the adult atmosphere in some courses taught jointly with colleges and industrial training centres.

- The new courses are highly regarded by the majority of pupils taking them and their parents. However, in a significant minority of schools, where the courses are largely restricted to low-attaining pupils, the courses do not have parity of esteem with other GCSEs.

The curriculum, management and resources

- Most schools allocate adequate time to teach the new double-award courses effectively. However, a significant minority timetable the courses as for single awards. Invariably, this lack of teaching time on such courses restricts the development of the necessary vocational dimension of the courses and depresses standards, especially for lower-attaining pupils.

- Most schools attempt to provide pupils on the new courses with relevant experience of industry, but the gap between the most and least effective is very wide indeed. Few schools are adequately organised for the efficient use of business links in the courses and many small and medium-sized businesses do not have the time or personnel to meet the demand from schools. Too few schools make enough use of visiting speakers or relevant case studies to bring to life the vocational nature of the courses. Schools which have good links with industry to support their teaching of the new GCSEs are in a minority. The links between pupils' work experience and their vocational GCSE courses are weak.

- Although most aspects of advice about Key Stage 4 options given in Year 9 are at least satisfactory, many pupils and their teachers are unclear about post-16 routes of progression from these new GCSE courses.

- The successful introduction of the new courses in schools has depended considerably on the effectiveness of senior management support. Many senior managers in schools relatively new to vocational teaching lack audit tools to enable them to accurately judge their schools' readiness to develop new vocational courses.

- Accommodation for the new courses varies widely. Some courses, run jointly with further education (FE) colleges or training centres, provide very good vocationally oriented accommodation, but there is a limit to the extent to which schools can make use of this. In the main, school accommodation was designed for different purposes and has not been adapted to improve its suitability for the teaching of these vocational courses.

- Resources for teaching and learning are gradually being developed. This is helped, for example in engineering, by staff of the sector skills council producing new materials.[1] Resourcing is limited, however, compared with that available for more established GCSEs.

1 Sector skills councils have been set up, for each major occupational sector, to ensure that the skills and training interests of employers are served. They work in partnership with various organisations in their respective occupational sectors.

Key issues

Action required at national level

a) Improve the clarity of course specifications to ensure teachers cover the content of the courses, provide a relevant vocational focus and assess pupils' competencies more confidently and accurately.

b) Give clear guidance to schools on the vocational experiences that they should provide for pupils which distinguish the new courses from general courses.

c) Develop a coherent national infrastructure using existing support organisations such as Education Business Partnerships, Education Business Link Organisations and the Science, Engineering, Technology and Mathematics Network as appropriate, to enable schools and businesses to form productive partnerships that:

- encourage employers to provide pupils with realistic industrial experience which support course objectives
- support the development of audio-visual and written materials and case studies to improve schools' capacities to teach realistically about industry
- advise schools on practical ways of setting up and administering links with industry in these new courses and setting them within the wider context of work-related learning.

d) Provide sufficient teachers with appropriate vocational qualifications and experience to teach these courses effectively by:

- defining minimum standards of competence for the teaching of each course
- training new teachers who are qualified and experienced in vocational subjects
- providing resources for existing teachers to update their knowledge, including through work placements as appropriate.

e) Develop guidance for the design of specialist accommodation in schools for the teaching of vocational GCSE courses, taking into account the views of teachers, FE lecturers, employers and school architects.

Action required at local or school levels

f) Senior managers should ensure that:

- ancillary and learning support staff are trained on the nature objectives of the course
- due regard is paid to the vocational contexts of the courses and that pupils learn to benefit from work with, and visits to, industry
- the courses are planned to relate to work experience and a work-related curriculum
- adequate time is made available for these double-award courses and that timetables are constructed to enable classes to make visits to industry
- administrative support for teachers is appropriate for any partnership work with external organisations
- when introducing new courses, they carry out a rigorous audit of course requirements against the school's capability to meet them, and take action accordingly
- courses recruit from, and cater for, the full range of ability
- appropriate challenge is provided to pupils of the full ability range taking the course.

g) Ensure that teachers deployed to teach these courses are competent to do so by giving them adequate opportunity and time to plan, update themselves on the assessment procedures required and to become familiar with current practice in the relevant vocational areas.

h) Improve careers advice so that pupils are clear about the progression routes from these courses to careers and further study post-16.

i) Ensure that sufficient and adequately specialised accommodation and resources are available to promote the teaching of these courses in vocational contexts.

Achievement and teaching

7. Standards of achievement overall are satisfactory or better in three quarters of lessons, good or better in a third, but are unsatisfactory in a quarter. These figures compare unfavourably with figures for all lessons in Key Stage 4 in 2003/04 which were 91%, 55% and 9% respectively. The quality of teaching is satisfactory or better in nearly nine tenths of lessons, good or better in a half, but unsatisfactory in a tenth. This also compares unfavourably with the national figures for all subjects at Key Stage 4 in 2003/04 which were 97%, 71% and 3% respectively. The lessons seen revealed:

   - considerable variations in achievement and the quality of teaching between subjects
   - the varying readiness of schools and teachers to teach them
   - that achievement and the quality of teaching have to be improved further in each subject to reach the levels seen in the more established subjects. However, such development was clearly taking place during the second year of the survey.

Applied art and design

8. This course is made available to pupils of all abilities in half of the schools visited, and is restricted to less able pupils in all but one of the rest. Pupils' achievement was good in a quarter of the lessons seen, satisfactory in a half and unsatisfactory in the remaining quarter. This compares unfavourably with the national picture in Key Stage 4 art and design where, in 2003/04, pupils' achievement was good, very good or excellent in over seven tenths of lessons. In this double-award course, little very good or excellent, but also little very poor, achievement was seen.

9. Higher achievement is found in schools with an effective tradition of teaching vocational courses. Here the teachers are well informed about the nature of vocational education and have good up-to-date knowledge of the application of art and design in industry. This is strengthened when pupils have direct access to visiting artists and designers and can study for part of their time in FE colleges.

10. The importance of links to real contexts and practices is demonstrated in this example:

    Pupils designed with a clear sense of purpose. All of the main tasks were set as design briefs with sharp deadlines reflecting commercial practice. Pupils understood well the stages in designing. They were familiar with many aspects of art, craft and design and had become so through regular access to critical, contextual and historic aspects of study. Visits to galleries, museums and

studios were frequent and enabled pupils to see their own work in the light of that carried out in the world of commerce. This understanding of, and skill in, designing had been improved significantly by extensive contact with practising artists, craftworkers and designers, including some of their teachers in school. By Year 11, pupils were good at selecting and manipulating materials to meet their intentions. They were increasingly aware of the financial opportunities and constraints associated with commercial designing and making.

11. In such situations, teachers make good use of the double amount of time devoted to this subject. The additional time, when well used, encourages pupils towards a:

- greater depth of investigation and evaluation
- more creative response to visual and tactile stimuli
- more rigorous and purposeful development of ideas
- more precise quality of making than might otherwise be expected in a single-award course.

12. The importance of good planning, drawing on vocational experience, is illustrated by this example:

The teaching team collectively had very good subject knowledge: two-dimensional and three-dimensional art and design work, ICT, and understanding of the vocational sector. Pupils benefited from the mix of FE and school tutors – the former, in particular, providing a vocational understanding and experience of teaching similar courses to older pupils. The short- and long-term planning was very good indeed. Each unit was documented on a side of A4, with references to learning objectives, activities, skills and techniques, media, tools and equipment, formal art elements, contact with artists, primary sources, vocational experiences, key skills, and the methods to be used to assess pupils and evaluate the unit. A lesson observed had a detailed, well-structured plan, which had been produced jointly by the tutors concerned. Pupils were taught skills incrementally, with good use made of study sheets to focus them on the skills, techniques or concepts being taught. Teachers provided authoritative demonstrations of particular techniques, for example blending colours. Pupils then applied their skills, for example designing a special edition of stamps, and were encouraged to work independently. Evaluation of ongoing work was an integral part of sessions, involving pupils in peer and self-assessment, using appropriate technical vocabulary. In the lesson observed, all the pupils were able to work productively on their own.

13. In another school, a climate of critical analysis, detailed teacher feedback to pupils on their work and the regular use of short-term targets had ensured that brisk pace and impetus in pupils' work were maintained.

14. As yet, however, such good practice is uncommon. In many departments little value has been added by the extra time available, and teachers' weak planning and a shallow understanding of the contemporary vocational context of art and design constrain pupils' achievement. At its worst, teachers' lack of vocational understanding leads them to fall back on their personal backgrounds in fine art and where this happens, the vocational course is little different in content from a traditional single-award course. As a consequence, nearly a fifth of teaching is unsatisfactory, as in this example:

> *Achievement was modest. Drawing was often perceptually immature and stilted, and craftwork relied too heavily on the teachers' worksheets and prompts. Evidence of pupils thinking independently was thin. Links with vocational contexts were tenuous. The teachers had a limited knowledge of the vocational contexts and contemporary art and design. This was reflected in the pupils' work, which was oriented towards fine art. There was little to differentiate what they were doing from a conventional GCSE course.*

15. Key skills teaching is rarely planned or executed and pupils' work is insufficiently enriched by the effective use of ICT.

Applied business

16. The course is made available to the full ability range of pupils in nearly all of the schools visited. It is generally seen as having equal status to other subjects and it usually attracts the full range of ability, particularly when it is timetabled as a single option. Some higher-attaining pupils do not opt for the course when it is offered as a double award because it then restricts their other option choices.

17. Pupils' achievement is satisfactory in all lessons seen. However, there is little good work, in contrast with traditional GCSE courses in business studies where in 2002/03 achievement was good in over half of lessons. Pupils have a satisfactory understanding of business vocabulary, different types of business and their functional areas. However, the analysis and evaluation of business issues are weaker especially in failing to challenge higher-attaining pupils who, in particular, are underachieving.

18. Much of the coursework seen in Unit 1 (Investigating Business) is descriptive and lacks analysis and evaluation. Pupils in Year 10 often resort to making evaluative statements unsupported by evidence. This is partly due to the nature of the specifications (see assessment, below) and partly

due to pupils' lack of overall business understanding at this stage of the course. Some schools have revisited this unit in Year 11 and there is some evidence of greater depth of analysis and better evaluation as a consequence.

19. Pupils' work in Unit 2 (People in Business) is often of better quality, including more evidence of analysis and evaluation, as in this example of an effective use of links with business:

> *Pupils had studied methods of recruitment, selection and training as part of their Unit 2 work using a variety of different examples drawn from textbooks and real businesses. Pre-arranged interviews were held with a range of different staff working at a major underground railway station. Before carrying out the interviews, pupils worked in groups to develop appropriate questions which were discussed in class. Pupils used the interviews to obtain information about an underground railway company's procedures and also to identify possible issues. The best pupils were able to compare the systems used by the company with those they had already studied. They also suggested possible solutions to the issues raised by staff using their background knowledge of other systems. These ideas were tested out with staff and their reactions recorded.*

20. Unit 3 (Finance) is assessed by external examination. During the survey, results had only recently been made available for pupils who sat the examination in January. Schools reported that pupils generally performed well in relation to their past attainment, but this needs to be confirmed.

21. Teaching of the academic course content is good or better in three fifths of the schools and satisfactory in the remainder. This is a similar pattern to Key Stage 4 single-award business studies courses overall. However, due to lack of time and links with business, the teaching about the vocational context is rarely good.

22. Nearly all teachers involved in the course have specialised business education qualifications and many have substantial experience of teaching on vocational courses. Teachers mainly have good subject knowledge. A substantial proportion, particularly of more recently appointed teachers, have business experience which is well used in developing the applied aspects of the course. In some schools, however, this experience is underused.

23. In some schools which have not provided the course as a double GCSE option, there is a more restricted range of teaching methods with lessons dominated by the need to deliver the factual content of the course or to complete coursework. There is little time for simulations, problem-solving activities or direct contact with businesses, yet it is applied and vocational elements which should distinguish the courses from conventional single-award business studies.

24. A few schools make sophisticated use of ICT to support learning, as in this example:

> *Good use was made of the interactive whiteboard in lessons to provide up-to-date examples of business practice, drawn from the internet. The department was developing a good range of in-house computer-based resources, including 'mini case studies' based on local businesses. Resources were also provided to pupils for home use through a CD and the department was seeking to develop a virtual learning environment for the course.*

25. There are weaknesses in the assessment of coursework. Incorrect or ambiguous statements often go unchallenged and teachers sometimes reward evidence which appears to meet the specifications but which demonstrates misunderstandings or fails to probe deeply enough.

Engineering

26. The attainment levels of pupils studying this course vary between schools. In the sample visited most schools ran the course for pupils of all levels of attainment, either in an open option or as part of a compulsory vocational GCSE option. In these schools, most pupils studying engineering are of average or slightly above attainment, having been assessed at levels 3–6 in National Curriculum tests at Key Stage 3. The lowest attainers tend not to study the subject because of the perceived difficulty of some of the course content. In a minority of schools, the course is reserved for lesser attaining pupils, including some who are disaffected. In one school, it is offered only to pupils in the top third of the attainment range at Key Stage 3.

27. Pupils' achievement is good or better in three fifths of lessons, which is slightly better than the national picture in design and technology (D&T) in 2002/03. However, achievement is unsatisfactory in one lesson in seven, twice as many as in D&T as a whole.

28. Pupils' capability in graphics and designing, including the use of computer-aided designing, is sound to good, similar to that in D&T in most schools except that fewer pupils achieved very high levels. Reflecting the nature of this course, pupils are developing their skills better in the more technical aspects of engineering drawing than in the more aesthetic aspects of graphics. Pupils' designing is less well developed where its teaching has been separated into a series of tasks in Unit 1 (Design and Graphical Communication) carried out separately from the making of products in Unit 2 (Engineered Products). In such cases, pupils have too little scope to evaluate the effectiveness of their designing by making the products they have designed and then testing them to gauge how well they perform in reality.

29. In most schools, pupils' capability in making products, as well as their understanding of materials, tools and processes is strengthened by this course. This is particularly so when schools work with FE colleges or training companies to provide well-managed collaborative courses. Thus, in one school:

> *Pupils in Year 10 were making a model compressed-air driven 'steam engine' in a large, well-organised and resourced mechanical engineering workshop in an FE college. The project was well established at the college, having a number of variations tailored to the capabilities of different groups including first year apprentices. This Year 10 class consisted of average and less able pupils who worked to tolerances of plus or minus a quarter of a millimetre, whereas older apprentices worked to finer tolerances. The pupils were seen milling slots in mild steel bar; facing off and reducing diameters of round aluminium bar; using a vernier height gauge for precision marking out; drilling and tapping internal screw threads; and general bench fitting. They were absorbed by the work, and said they were very content with the industrial ambience of the workshop. The clear expertise of the college lecturer and technician and their decisive, firm and well-organised management of this workshop, promoted the safe, efficient and accurate metalworking carried out by the pupils. The upshot was that this difficult group which contained a number of boys who had previously been excluded from school for disruptive behaviour saw great value in the work, were willing to accept the necessarily tight structure and firm leadership, and achieved high standards in relation to their Key Stage 3 test results.*

30. Higher-attaining pupils in some courses taught jointly with post-16 providers, however, are often not adequately stretched by the craft teaching. This is clear from the evidence of the practical work carried out by pupils in some FE colleges which are traditionally geared up to teaching pupils of average or lower attainment. Also, in one training centre, the staff were too disorganised or unwilling to provide firm enough leadership to be able to teach pupils from a local comprehensive school effectively.

31. Pupils' knowledge and understanding of, for example, the properties of materials or the functions of mechanisms or electrical components, as assessed in Unit 3, are sound to good. This reflects the focused teaching seen on most courses. Pupils' vocational understanding is also sharpened by the teaching of industrial practices such as 'just-in-time' production. Most schools arrange visits to industry to reinforce this teaching. However, the value of these visits is reduced when they are undertaken without detailed briefing and debriefing of the pupils.

32. The more modern and 'hi-tech' aspects of engineering – for example designing and making products which carry out precise, operating functions,

the application of mathematics and science in designing and manufacturing or the quantitative testing of materials or structures – are less well developed than the more craft-oriented approaches adopted by most schools.

33. The quality of teaching is generally at least sound and is often high where teachers have good and recent experience of the engineering industry. This is particularly noticeable in well-managed courses taught jointly with FE colleges and vocational training centres, where the subject expertise of staff is often very good. In one training centre, high-quality craft tuition was based on very clear objectives, a well-resourced and organised workshop, and good one-to-one and small-group coaching. In contrast, in a minority of schools the teaching is limited, out of date or simply not sufficiently oriented towards industry.

34. Some teachers who were trained in craft engineering and had struggled to adapt to National Curriculum D&T have had their teaching revitalised and confidence restored in teaching this new course. Others, however, lack up-to-date awareness of modern industrial practices. A few newly appointed teachers with engineering degrees, and sometimes D&T postgraduate certificate in education (PGCE) qualifications, are making a substantial contribution to the teaching of those aspects of the subject, such as technical designing or the application of mathematics and science, which are often not the strength of those whose main expertise is in craft. However, in some schools, teachers with engineering degrees are teaching mathematics and science subjects only. Their expertise is not being deployed in the engineering course.

35. The introduction of the courses has encouraged teachers to plan their lessons soundly, but in some schools it has yet to influence medium- and long-term planning generally. As a result, the use of visits to industry, external lectures and work experience, for example, are often seen as additional extras to mainstream teaching. They need to be more carefully integrated into course planning if they are to have optimum impact on pupils' understanding of industry.

36. Great care is taken in the teaching of practical work to ensure the health and safety of pupils and staff.

Health and social care

37. In most schools this course has been made available as an option to all pupils in Year 10 and Year 11. However, the great majority of pupils taking the subject are of average attainment or below, having been assessed at levels 3 to 5 at Key Stage 3. In just under a quarter of schools visited it is seen as a course only for low-attaining pupils.

38. Achievement is satisfactory in all schools visited and good in about one third. Most pupils are making sound progress and some lower-attaining pupils are working above predicted levels. In all schools visited pupils are gaining a clear understanding of health and social care topics. This includes health issues, health risks and knowledge about families and relationships. Pupils are able to apply this knowledge to their own lives and to their personal relationships.

39. In many instances the assignments that pupils undertake insufficiently reflect work-related learning, with little opportunity to develop the application of theoretical concepts to care practice. However, group work provides scope for pupils to develop social skills. In most schools, pupils have the opportunity to develop study skills and learn independently.

40. The quality of teaching is not as good as that in Key Stage 4 in all subjects. It ranges from very good to unsatisfactory, with just under two thirds of lessons observed being good or better. The following example demonstrates some of the characteristics of better lessons:

> *The course had been well planned and schemes of work covered the whole two years of the programme. Teachers had exceptionally good knowledge of appropriate methods of teaching to match the needs of the pupils. Teachers had high expectations of pupils and lessons developed at a good pace. They encouraged the development of independent learning skills and pupils were observed returning from carrying out a series of interviews with healthcare professionals. Pupils had set up the interviews and had been well supported by teachers to formulate a series of appropriate questions. They worked in small groups to present their findings orally to the whole class. The teachers encouraged pupils to evaluate the work of other groups in a constructive manner. This enabled pupils to carry out meaningful evaluation of their own work.*

41. The less effective lessons lack vocational application and teachers have weak subject knowledge. Although half of the teachers seen have backgrounds in health and social care, the other half do not. The latter find it difficult to give pupils an up-to-date insight into vocational practice and, for example, some teachers provide inaccurate explanations of the legal aspects of health and social care provision. Too few schools enhance the pupils' vocational learning with visits to care settings or by using visiting speakers. In nearly all schools, pupils are not given sufficient opportunity to observe care professionals working with clients. Links between work experience and the content of the course are weak.

42. Pupils are taught about social issues but they do not learn enough about the application of care skills and care values. They are taught about the

theoretical basis of human development but are provided with few opportunities to observe aspects of development in practice. In a small number of schools, the school nurse teaches some lessons but has varying success in bringing to life the vocational aspects of the course.

43. In a minority of schools the course is taught in conjunction with FE college teachers. This often improves pupils' experiences and allows them to engage in enrichment activities such as first aid alongside their GCSE studies. In one school visited:

> *The FE college teachers provided good up-to-date vocational knowledge; the school provided good learning support and time for independent study. Pupils benefited from the wider range of teaching methods and resources, the development of independent learning and the opportunities to experience additional enrichment activities related to health and care which the school was unable to offer. The school felt that the pupils had matured more quickly and become more independent as a result of their college experience.*

44. On occasions, however, the lack of stability in college staffing disrupts pupils' learning.

Applied information and communication technology

45. In all but one of the schools visited, this course is offered to, and taken up by, pupils of all levels of attainment. At best, pupils' achievement in this course is comparable with that of high-achieving pupils in other ICT courses. However, there is a wide gap between this and the low achievement of some pupils on the course. In particular, the coursework of some pupils is narrow and vocational elements are underdeveloped; they struggle with aspects of the course such as understanding how business and industry settings are organised and how data flows within organisations.

46. Pupils benefit where they experience such vocational aspects in practice before designing systems for themselves. The keys to effective vocational coverage in this subject are actual contexts and real users of ICT. Without an understanding of how firms and organisations function, and the ways in which data flows occur within them, pupils find themselves in difficulty, as in this example from a Year 10 class:

> *Pupils were designing systems, mostly chosen from a list of fictional contexts, for example a video shop. Two had chosen real contexts from their parents' work – a tiling company and a car dealership. All had identified and listed the user requirements using a school proforma and were seen designing. Some specifications were clear, others were muddled. The standard of English varied and few pupils were comfortable with the concepts of 'input, process and*

output'. Some had problems understanding 'information needed' and they cited, for their projects, a need for 'more memory', rather than the precise information that was required. Those who had not based their work on a real context, and had not met the potential user, were struggling. This partly reflected their lack of direct and practical experience of the businesses concerned and partly their weak conceptual understanding of information needs or input, process and output. The task had come too soon in the course and pupils had, so far, too little experience of ICT in organisations to be able to tackle it realistically.

47. Teachers often find it difficult to develop good links with local businesses. The best practice, shown in this example, involves extensive efforts by the teacher in charge of the course to find real settings for as many pupils as possible:

The planning for the vocational element was excellent. Staff had planned diligently to support pupils in finding placements in local firms – often via family or friendship connections. Where pupils did not have these possibilities, then they were supported through work experience links to find placements elsewhere or undertake a case study of the school's administration system. Other links yielded visits for pupils to local firms as well as visiting speakers in school. This approach had resulted in better understanding of vocational aspects of ICT.

48. Pupils generally make good use of their existing ICT skills, for example in enhancing visual presentations. They readily apply their prior learning in new contexts, for example, by designing and producing a range of business documents. Work on research and presentation helps many pupils develop their independent learning skills. Pupils' presentation of work is often of good quality: they include screenshots and annotations which show how they are improving layout, content and presentation; the best examples are visually stunning and make effective use of colour. They deploy presentational technologies well, for example, in the following lesson where they had worked on advertising using multimedia presentation software:

Pupils worked in small groups as branches of a fictitious travel company. They had explored possible travel offers and were now developing multimedia presentations to market these. The teacher led a discussion on the nature of the presentations and their intended location and audience – for example, internet, fixed display, TV. Each pupil had worked on a presentation and the manager in each group had chosen one for presentation to the class. These were well developed and many had good visual impact. The teacher made effective use of the networking facilities to call up selected presentations for display to the class. The rest of the class were invited to comment on each presentation and make pertinent and constructive criticisms.

49. Lower attainers find the coursework challenging and express concerns about the high volume of work in this subject compared with other GCSEs, especially where too little curriculum time is allocated. These pupils find particular difficulty in coping with those aspects of the course concerning the application of ICT in vocational settings. They are able to develop their own ICT skills, knowledge and understanding but lack the knowledge and understanding to relate these meaningfully to real contexts.

50. The teaching is satisfactory or better in over nine tenths of lessons. Teachers have good subject knowledge and most keep themselves up to date with recent developments. Their recent experience of working in organisations outside education is more limited, and most would benefit from short-term placements in a local firm. In one school where the whole Year 9 cohort made an early start to this GCSE course, a large number of non-specialists were deployed and this presented particular difficulties in quality assurance and in disseminating training.

51. Lesson planning is generally good. The best teaching is characterised by brisk pace, often with a variety of timed activities and good plenary discussion of the work covered. Teachers make good use of presentational technologies to enhance explanations and demonstrations to classes. However, teaching often lacks sufficient differentiation, especially for the lower attainers who are expected to move too quickly from developing and applying their own skills to an understanding of how ICT can benefit firms and organisations. This group tends to need much more personal experience of contexts beyond school if they are to make such a conceptual leap. Another area of weakness is in end-of-lesson plenaries, where the main teaching points are not always sufficiently emphasised.

52. Online or other computer-based resources are mostly used judiciously and in combination with other teaching methods. Where used appropriately, these online materials encourage good independent learning. Some schools have increased access to such materials by locating them on the school intranet. These are usually well used, though sometimes too wordy and insufficiently adapted for lower attainers. In one school, teachers have been involved with a group of schools, organised by the local education authority (LEA), in preparing learning materials and this has been highly beneficial. However, many teachers feel isolated from such networks.

53. Plans for the induction of pupils to the course are often inadequate. Pupils are sometimes unclear about the nature of vocational courses. Induction is most effective where pupils undertake related tasks at the end of Year 9 as in this example from a 14–19 upper school:

Incoming pupils had two lessons at the end of the summer term when they came here for three days. They had to provide a word-processed piece about themselves, including their ICT skills, and what they hoped to get out of the course. They also had to research into how organisations in the real world use ICT and draft a letter to a local organisation. In one feeder school, the pupils e-mailed the outcomes of these tasks to the teacher here at the upper school. The course began with a bridging unit covering ICT in society which built on these tasks undertaken in the feeder schools.

54. The few schools which have arranged a significant number of external visits have been effective in promoting a genuine interest and a better awareness of the contribution of ICT to work settings. Effective collaboration between the teachers and staff at the work setting is essential to ensure that the materials produced and content of any visit or talks have most impact. Occasional use of visiting speakers has also been effective where these have been well briefed about the areas to cover and the pupils adequately prepared so that they ask appropriate questions.

Leisure and tourism

55. In the great majority of schools, leisure and tourism is taken by small numbers of mainly lower-attaining pupils. In approximately a quarter of schools, it is offered across a wider attainment range. Frequently, the teachers, parents and the pupils see the subject as more suitable for non-academic pupils, and few higher attainers take it up. Standards of achievement and teacher expectations range from average to low, with few pupils expected to attain more than a C/C grade at best.

56. Pupils in most schools have gained a sound basic knowledge of the leisure and tourism industries but partly as a result of the disproportionate emphasis given by teachers to Unit 1 (Investigating Leisure and Tourism). Pupils' factual knowledge is usually better developed than their understanding. Most pupils recognise terminology such as package holidays or market research, but few have developed the skills of analysis and evaluation required by the course. As a consequence, much of the work is descriptive and demonstrates only a superficial understanding.

57. Often there are few practical opportunities to visit vocational settings or engage in simulation and role play, so that knowledge of customer care is poor and there is very little understanding of marketing and the needs of different people, as this example shows:

The pupils had visited two leisure centres, a budget hotel and branded restaurant. This was too narrow a range of experience and did not reflect the industry as a whole. Pupils did not have any knowledge of tourist information offices or tourism in their local area. They compared the leisure centres (one

private and one local authority) which they had visited but their work did not show understanding. They used little more than recall when talking about industry and aspects of the marketing mix and they were poor at applying their knowledge. They were able to state what a 'Strengths, Weaknesses, Opportunities and Threats' (SWOT) analysis is from recall but were not able to interpret or give examples of application. Pupils' understanding of customer care was rudimentary. They recognised that it involved dealing with complaints but understood too little about meeting the needs of different client groups and paying attention to caring for customers.

58. Generally, pupils with lower prior attainment make better progress compared with the more able pupils who frequently underachieve because of insufficient differentiation in the teaching. Additionally, the assignments given to pupils are often heavily guided by teachers to ensure they meet the examination criteria but they allow few opportunities for individual pupils to show what they are really capable of achieving. In a majority of schools, the gender difference is also pronounced with boys' achievement overall being lower than that of girls. In general, boys produce significantly less work and this is frequently poorly presented or unfinished.

59. In all schools visited, little consideration is given to key skills in planning teaching and learning. However, many pupils do have good ICT skills and the presentation of work, particularly assignments, has frequently been improved through the use of computers. They make insufficiently discriminating use of the internet for research. In some schools, difficulties of access to ICT prevent regular development of these skills.

60. The quality of teaching and learning varies greatly from school to school but is weaker overall than in other new GCSE subjects: in over half of the lessons it is unsatisfactory or poor. The majority of teachers have little or no experience of teaching leisure and tourism. A large number are geography teachers who struggle to teach this very different subject. This constrains the range and quality of pupils' experiences. Even in the minority of schools where teachers have taught GNVQ leisure and tourism, their subject knowledge tends to be very theoretical. Most teachers lack first-hand and up-to-date experience of the leisure and tourism industries and so cannot provide practical examples to enliven teaching, or good, relevant resources. Additionally, they often have few links, if any, with local employers or organisations which can support practical work-related experiences. In a majority of schools, leisure and tourism is being taught as an academic subject with an over-reliance placed on secondary sources such as textbooks. The practical and vocational elements are weak.

61. Teaching methods in many schools are not appropriate to a vocational course or the ability range of the pupils. Many lessons involve generally 'safe' routines with heavy teacher guidance and often passive pupil inattention. Questioning is often closed, focusing on the factual content rather than allowing pupils to develop and express their ideas. Teachers' basic insecurity in the vocational aspect also results in the limited use of role play and simulation. Teachers' expectations are often low with tasks designed to maintain discipline and clamp down on potential disruption.

62. In some successful courses, effective use is made of the specialist expertise of staff from FE colleges. Also, some schools make good use of outside speakers and specialists to provide a practical perspective. Where this is linked to the whole teaching programme, it can help to raise pupils' expectations, improve understanding and enhance their portfolio assignments, as this example shows:

> *Following a visit to a museum, pupils were expected to complete an assignment suggesting practical ways in which the museum could improve customer care, particularly for visually impaired customers. The teacher arranged for a specialist from the local education authority's visually impaired service to provide a practical session for the pupils. This enabled them to experience a variety of visual disabilities and empathise with the practical difficulties this caused. Pupils enjoyed the opportunity to try to perform a range of basic everyday tasks wearing glasses which simulated a particular visual impairment. This enabled them to discuss the customer care issues with greater perception and understanding and led to valid recommendations being suggested about the issue of access at the museum.*

Manufacturing

63. Most schools running this course offer it to pupils of all levels of prior attainment. It has recruited widely across the attainment range, from levels 3 to 8 in the Year 9 National Curriculum tests, with a large majority having attained levels 4 to 6.

64. Pupils' achievement is satisfactory overall. High achievement is less common than in the more established D&T courses, whose National Curriculum programme of study is intended to be covered by manufacturing.

65. The designing of products for manufacture is uneven. Pupils are expected to develop a quantitative approach to designing, within which mathematics and science should be applied as appropriate. This is underdeveloped in most courses. Where it has been developed, better work results, for instance in producing a simple electronic device through team activity, or devising, in collaboration with a master baker, a bread product of interest

to the local community. Only rarely is the manufacturing activity adequately recorded, such as through use of video or digital photography, to enrich pupils' portfolios.

66. Pupils often develop a qualitative appreciation of manufacturing concepts. They are able to analyse simple products and use what they understand from doing so in their own designing. Visits to local businesses, contributions in school from industry specialists or visits to relevant further and higher education centres that work in the sector, and use of the internet, help pupils to focus when making design decisions.

67. Too often pupils' qualitative understanding of manufacturing processes does not extend to quantitative aspects, such as recording the time required for a team member safely to complete a process, or the overall effect of one production plan compared with another, in terms of time required to make each product. In some of the best practice, pupils pursue these elements; they gain deeper understanding of the course content.

68. In all the schools visited pupils can formulate simple production systems well. Usually through trial and error they consider how the component parts of a design should be processed, stored temporarily if needs be, brought together in a rationally planned sequence and assembled, exercising suitable hazard and or other quality control techniques.

69. Where resistant materials are used without very careful planning as a basis for this work, the pupils' assignments are often excessively complex, and require greater allocations of time, or access to more sophisticated processes and equipment than are available. In such instances, many pupils become frustrated. Often too, insufficient use is made of ICT during designing, and this reduces pupils' attainment in comparison with established D&T courses in which computer-aided designing is usually soundly or well taught and improves productivity.

70. The externally assessed Unit 3 (Application of Technology), which is common to manufacturing and engineering, revealed the greatest variability in standards in the first year, and though it improved, remained very variable in the second year. Investigations of particular sectors, such as telecommunications, printing and publishing were not seen.

71. The treatment of tools, materials and equipment is usually sound and sometimes good. Weakness results from lack of emphasis on the significance to industrial manufacturing, as opposed to making by hand, of particular devices, processes or machines. Computer-aided manufacture is treated variably, sometimes insufficiently. The use of computer-aided manufacturing is rare, due to lack of equipment in most schools.

72. Pupils' portfolios reflect this unevenness. The better structured portfolios give well-organised accounts of first-hand observations. In these, key terms from the course specification are analysed and used appropriately in written answers and coursework folders, drawing on textbooks, the internet and contacts with the industry, as in this example:

> *In a good lesson, pupils had worked in production teams, analysing possible approaches to making pizza and forecasting likely consequences and difficulties. The class formed into four groups, each having an observer/analyst who noted issues and recorded times taken for each stage of the work. Initially pupils found difficulty in working at a steady rather than rushed pace, there being an implied incentive to hurry when the rate of production was so much faster than anything they had previously experienced. On completion, the teacher assembled the groups and helped them begin the tasks of analysing their systems and the flaws in them.*

Too many pupils' portfolios, however, are disorganised. They place pupils in danger of losing marks where sloppy presentation gives a misleadingly poor account of their achievements.

73. Teaching is sound overall, but there is wide variation and it is unsatisfactory in a quarter of lessons. It is stronger where it draws on relevant background knowledge of the industry or recent experiences such as teacher placements in firms. In the better practice, thorough planning involving technicians, learning assistants or classroom assistant staff features clearly.

74. Good teaching often encourages team-working skills. Practical work varies. At best it creates opportunities for and appropriate use of computer-aided designing and manufacturing, such as when producing several components of exactly the same kind for use in a batch-production assignment.

75. Visits to industry, or use of other contacts, such as visiting speakers, graduate trainees or visits to relevant centres of higher education, are important in enabling pupils to see the relevance to economic and industrial activity of their learning in school. Pupils value them. In the better practice, the visits to industry are planned to complement classroom learning. The effectiveness of these visits depends critically on clarity about learning objectives, preparation in advance and efficient administrative support in school and from an education business links organisation or similar intermediary. Preparation on the part of pupils might include the framing of questions they intend to put to specialists at the company they visit, planning how they will record answers and, where permitted, taking digital photographs to use in their written portfolios or downloading similar illustrations from the internet.

76. Some Increased Flexibility Partnerships (IFPs) enable good collaboration. In one town, a summer workshop was mounted by IFP to enable pupils to visit a number of companies, spanning several of the GCSE courses in a single period. This was an efficient way to manage such collaboration, minimising the burden on employers and providing a timetabled opportunity for schools.

Applied science

77. Most schools using this course have selected one or two teaching groups as suited to this particular alternative in their range of provision for this compulsory subject. These pupils were generally assessed at levels 4 or 5 in National Curriculum tests at the end of Key Stage 3, though in some schools significant numbers of pupils are at levels 3 or 6. Selection often takes account of pupils' aptitude for coursework rather than assessment by examination.

78. Pupils demonstrate a good command of subject knowledge and understanding, better than that of comparable groups on conventional double-award science courses. In many cases, pupils are operating about one GCSE grade higher than might be anticipated. This enhanced achievement is more evident among those with higher prior attainment. Thus:

> *Pupils who had attained level 4 or 5 at the end of Year 9 could recount and explain 'blind spot' effects in relation to the location of the optic nerve and relate this to risk assessment in practical work. Similar pupils could explain how semi-lunar valves in veins prevent backflow with a reversed pressure gradient, for instance in athletic or industrial activity. Pupils with slightly higher prior attainment could explain why 'reciprocal of time' is a useful measure of the rate of a reaction and link this to commercial costs.*

79. Practical skills vary considerably from school to school. At one school, pupils applied faultlessly sophisticated aseptic techniques in microbiology routines that are more typical of sixth form work. Elsewhere, pupils were less aware than they should have been of immediate hazards in carrying out flame tests.

80. Occasionally, standards and achievement are not as high as they could be because work has wandered too far from syllabus specifications, because appropriate equipment has not been available, or because paper or electronic learning materials have been insufficiently challenging.

81. The profile of teaching quality and learning in lessons is slightly higher than is generally found with double-award science: it ranges from unsatisfactory to excellent, with a substantial incidence of very good lessons. Almost all the teaching is satisfactory or better. In general, teaching is very effective in

engaging pupils' interest and commitment. Most teachers respond well to the opportunity to teach new material, or traditional material with a new slant. Often, teaching is in the hands of staff whose careers are moving ahead rapidly, for example recently qualified teachers or aspirant heads of department who bring their cutting-edge skills to the new courses. It is commonly taught by a pair of teachers with strengths in biology and physical sciences (usually chemistry). Schemes of work are usually of good quality: they often integrate Unit 1 (Developing Scientific Skills) and Unit 2 (Science for the Needs of Society) successfully.

82. About a quarter of schools have one or more science staff with a strong background in science-based employment, for example: nurse, hospital pathologist; chemical engineer; or garage worker. Such staff often relish the opportunity to use their expertise, for example:

> *In one school, a former scene-of-crime officer donned her white anti-contamination kit to add impact and authenticity to a 'murder mystery' scenario. This contributed markedly to the rapt attention of the pupils.*

83. Several schools have made links with hospitals, the fire service and armed forces to give pupils well-received presentations on their own premises or in school. In one cluster of schools, a vocational science day was based at one school, with presentations on structural engineering by the army, fingerprinting by forensic science officers, culturing by staff from a hospital pathology laboratory and gas by a utility firm. A number of schools have productive links with local food and other industries, for example brewing companies, and margarine and pie manufacturers.

84. Other initiatives included, in one school, good support from a 'researcher in residence' – a PhD student working on the coagulant properties of clays in arresting the leaching of nitrates. In work on anaerobic respiration, a teacher captured the imagination of low-attaining but high achieving pupils through an e-mail link to a local football player. Some well-conceived and highly challenging practical work gave a realistic model of industrial practice, for instance, in a sequence of reactions from ore to metal in which yield was measured. One school also created a simulated workplace environment, with an 'employee of the month' certificate awarded for good independent working and progress.

85. While there are many such examples of good practice, more generally industrial links are not as well developed as they should be. Sometimes this is because transport and timetable implications limit the range of off-site visits. But also a minority of schools have scarcely begun to develop the vocational implications of the course although there are particularly interesting industrial applications of science very close by.

86. Group sizes (on average, about 16) are generally smaller than Key Stage 4 science groups for pupils of similar ability and positive disposition. Teachers are therefore able to get to know well the learning needs and potential of individuals with whom they work for five hours each week. Well-targeted encouragement and strong one-to-one rapport are often strong features of the teaching. With this support, pupils are able to sustain worthwhile semi-independent learning in lengthy practical tasks and coursework assignments. A fair proportion of lessons have the mature ambience of post-16 learning.

Pupils' support and guidance

The status of the courses and progression routes

87. Generally, the new subjects are highly regarded by most pupils and their parents. However, in a significant minority of schools, they do not have parity of esteem with more established GCSE subjects.

88. The pupils studying them, and reportedly their parents, mostly value the new GCSEs as highly as traditional GCSEs. In particular, applied art and design, business, ICT and science, together with engineering and manufacturing are generally regarded as positive choices by most pupils. In some parts of the country where significant numbers of adults are employed in engineering, the engineering GCSE course has high status and is regarded as more realistically related to this industrial sector than established D&T courses.

89. However, in some schools where the courses are specifically chosen for the lower-attaining pupils, they are regarded as being of low status: this is particularly true of leisure and tourism and health and social care. In some schools, high-attaining pupils believe the new GCSE courses to be of lower value than traditional courses.

90. Few schools running the new courses have their own post-16 vocational courses onto which GCSE pupils might sensibly progress. The guidance given to pupils on such progression varies from poor to very good. The new GCSEs are designed deliberately to be taught through practical applications rather than theory. In applied science, this is not an ideal preparation for some academic GCE AS and A level courses, for example in physics, but the implications of this have rarely been made clear to pupils.

Attitudes, behaviour and motivation

91. A major aim of the government's policy of promoting more flexibility in the curriculum at Key Stage 4 is to improve the attitudes, behaviour and motivation of pupils. This aim has been realised in most of the schools through the introduction of the new GCSEs. Pupils' attitudes, behaviour and motivation are good or better in three fifths and satisfactory in nearly nine tenths of the lessons. However, where the introduction of particular subjects has been poorly conceived or managed, gains have been small.

92. The benefits which the courses have brought include:

- a wider range of work than would have been possible in a single course
- high levels of pupils' interest stimulated by the relevance of the course to the world of work and future careers

- additional time which, when well used by teachers, allows closer support for pupils and feedback on their performance
- a variety of interesting teaching methods and activities including vocationally oriented practical work
- opportunities to collaborate in pairs or small groups to plan, research, experiment and present ideas and findings to the class, and good access to ICT equipment and appropriate software
- care taken by teachers to build up the self-esteem of disaffected pupils by attributing high status to the course
- the adult atmosphere in lessons carried out in well-managed courses in FE colleges and training centres, and in some schools.

93. Generally, positive attitudes have been sustained over the two years of the course. This example shows the considerable impact of one course:

> *The attendance of some potentially disaffected pupils had improved significantly with overall attendance being higher than that for similar pupils in the cohort. Almost 70% of the pupils taking leisure and tourism had improved their attendance and they were very positive about the subject and the quality and range of their experiences. They enjoyed the afternoon release to attend college. They were given the responsibility for making their own way there. The pupils thrived on the atmosphere and on 'being treated like adults'.*

94. Although good behaviour and motivation are common in most of the lessons, behaviour is a cause for concern especially in a small minority of the schools teaching health and social care and in half of those teaching leisure and tourism. In such schools, pupils have become disillusioned by the lack of practical opportunities being offered, the weak or outdated vocational expertise of the teachers, the textbook-based teaching and the lack of opportunity to work in or visit vocational settings. Invariably, these problems arise when schools set up and manage these new courses with inadequate staffing and resourcing. Pupils in these circumstances often feel that they have been misinformed when making their choices.

Support, guidance and progression

95. In most courses, pupils are well supported by teachers. The extra time allocated to the new courses enables teachers to know more about the progress pupils make. It also promotes effective monitoring of progress by the teachers and the giving of useful feedback to pupils. This varies from the very good to the unsatisfactory but in most schools visited it is at least satisfactory. Appropriately stringent procedures are in place to ensure that pupils using workshops, laboratories and studios, both in schools and colleges, are able to work in healthy and safe accommodation.

96. In contrast with most other new GCSE courses, leisure and tourism is often used principally as an option for the lower-attaining and, sometimes, disaffected pupils. In some schools, this creates classes which are difficult to teach and in which teachers' attention is focused more on resolving behavioural difficulties than in supporting pupils to learn effectively. In some such cases, pupils are inadequately supported and this is often exacerbated by the limited opportunities given to pupils to learn through practical and vocational activities.

97. The majority of schools give good option choice guidance to their pupils in Year 9, sometimes brought to life by displays of pupils' work during option evenings. They usually incorporate additional advice on the new GCSEs, and in most schools certain groups of pupils are steered towards them. The pattern for this varies markedly, however. In one city technology college, pupils were divided into two ability bands for Key Stage 4 based on National Curriculum test results in Year 9: the vocational courses were offered to the less able band. In contrast, another school, with many high-attaining pupils, restricted entry to the GCSE engineering course to those in the top third of the ability range and taught the course accordingly as a demanding subject. Pupils and parents had been given a very thorough presentation by an assistant headteacher to show the range of the engineering industry and the career opportunities, from professional to technician to craft levels.

98. In several schools, pupils who are predicted to achieve GCSE grades C/D are selected for the applied courses. Schools believe the courses to be more suited to these pupils' styles of learning and that the pupils will therefore find it easier to gain a higher grade. This is expected not only to improve the pupils' own performance but also the schools' positions in league tables.

99. In general, schools give their Year 9 pupils sound or good written and verbal guidance on Key Stage 4 option choices. However, pupils are rarely able before the course induction to sample lessons or gain first-hand insight into the nature of FE or industry-based parts of these courses. Pre-course induction events are also rare but when well planned they give pupils a good start. This example is from a school where all pupils take one vocational GCSE course:

> *In addition to very good careers and options advice, each new GCSE course was allocated a two-day induction block at the end of Year 9. In most courses, pupils were taken off site to experience a range of vocationally oriented activities. In GCSE engineering, pupils had engaged in a demanding and tightly structured technical design-and-make project in the school workshops. This gave them a good insight into the discipline and precise nature of the subject.*

100. Generally, where schools work in collaboration with FE colleges or universities to provide courses, pupils are given, during their induction, careful presentations and tours of their facilities and clear guidance on travelling arrangements.

101. For some subjects, professionally produced leaflets and information on the websites of industrial support and training organisations give pupils and parents good introductory information.

102. In most schools which have a sixth form running vocational courses, or where pupils study part of their GCSE course in an FE college and observe older students, pupils are generally more aware of the courses and routes to progression available after the age of 16. However, even in schools with good option choice guidance, most pupils seen in Years 10 and 11 lack a precise understanding of where success in their particular GCSE courses could lead, due largely to the lack of clear and detailed guidance given by schools on progression routes and career pathways in these vocational sectors. This is at its most acute where courses are taught predominantly by teachers lacking up-to-date expertise in their vocational sector. Many teachers are uncertain about the extent to which the courses prepare pupils for further studies. Liaison between schools and FE providers is often better in areas with an IFP.

Inclusion

103. The introduction of the new GCSEs has not yet provided significant new opportunities for pupils with special educational needs (SEN) in the schools visited. Additional support is rarely provided by schools except in applied ICT where technicians and classroom assistants sometimes focus attention on pupils who are struggling with set tasks.

104. The gender imbalances in applied courses are generally the same as those found in similar groups for other subjects, despite the efforts of schools to address this issue. There is no indication that the courses are having any effect on conventional bias in subject options. For example, far more girls than boys opt for health and social care, many more boys take engineering, and lower-attaining groups in applied science often include more boys than girls.

The curriculum and its organisation

105. More than three quarters of schools satisfactorily plan and organise the curriculum for the new GCSE courses. Planning is generally more effective in applied business, applied science, engineering and manufacturing than in the other subjects. Planning for leisure and tourism is poor in over half of schools.

106. The effectiveness of curricular planning and organisation varies considerably among subjects and schools. Those schools with a longstanding commitment to vocational education, for example through the teaching of GNVQ courses, are among the most successful in introducing the new GCSEs smoothly.

107. A crucial factor in the success of introducing the new courses into schools is the allocation of time for teaching. A double-award GCSE course is normally taught in 20% of the school timetable, but this reduces the range of options available to individual pupils. In practice the full 20% is generally allocated in subjects like applied art and design, engineering, manufacturing and applied science. In the few instances where these subjects are timetabled as single-award courses, pupils are usually given compensatory experience in twilight or lunchtime sessions or, in one case, a two-week block of time in an FE college. Such provision allows courses to flourish. However, in those subjects where 10% of time is the common allocation, including applied business, applied ICT, and leisure and tourism, this has a narrowing effect on what can be provided. For example, collaboration with employers is often minimal and teaching concentrates on preparing pupils for formal assessments at the expense of giving them practical experiences of the vocational sectors.

108. The new courses also present school timetablers with challenges in creating half-day or full-day blocks to allow for visits to industry or courses taught jointly with FE colleges or training centres. Where such blocking has not been arranged, out-of-classroom activities are difficult to organise without disrupting the normal routines of the schools. The consequence is that, in some schools, such activities have been negligible. Many schools are sensibly reviewing their timetabling structures and intend to arrange for such blocking in the future.

109. The most effective courses are those which deepen pupils' experience of their vocational sector through, for example, the effective use of collaborative teaching with FE colleges or training companies. In such cases, pupils gain a clearer insight into the vocational sector through direct interaction with staff who train industrial personnel and by observing the work of older students and apprentices in industrial training settings.

110. The most effective courses involving collaboration with FE colleges or training companies are those in which pupils are very well briefed about the nature of these other organisations and well supported to ensure that they benefit most from the adult environments. Thus in one academically oriented comprehensive school, an engineering course is successfully jointly run in a local FE college:

> *The pupils were low attainers and had occasionally been disruptive in academic lessons. The school staff had briefed them in detail about the course and engaged in much discussion with the pupils to convince them that they would succeed in, and benefit from, the course. This was intended to raise self-esteem and staff reported that it had done so successfully. They began to believe that they were rather privileged in having been selected for this course. They responded well to the rigour and discipline of the craft course and the industrial ambience of the college's engineering department. The school's course co-ordinator was timetabled to attend college with the pupils and he used this time assiduously to monitor and record their progress, assist in the teaching and work with the firm college staff to ensure safe practice, good discipline and brisk pace.*

111. Few schools are supported to strengthen the teaching of vocational applications in school by collaborative arrangements with college staff. In the small number of cases where this happens, it is usually effective. College staff provide school teachers with help in forging links with vocational providers and in writing assignments with clear vocational application. This could be developed further without the need for pupils to spend large amounts of time away from school.

112. Work experience and enterprise activities can provide excellent vocational experience related to the GCSE course, but rarely do these contribute to GCSE coursework. In part this is because teachers' interpretations of the course specifications and assessment procedures lead them to believe that it is inappropriate to build such activities into their teaching and assessing of the new courses. It is also due to the ways in which work experience and enterprise activities are organised separately from the new GCSE courses in most schools. A few schools are developing ways of strengthening the impact on learning of these courses and activities by linking them more closely together, as in this example:

> *All pupils taking the applied business course were involved in setting up and running their own mini enterprises. They were supported by teachers with business experience and business mentors. Pupils had the opportunity and time to apply and develop their business understanding in a real context. The school was working with the awarding body to enable pupils to make direct use of simulated businesses in their coursework and to compare them with real businesses.*

Assessment

113. This survey has covered the introduction and early teaching by schools of these new GCSEs. It has dealt with assessment procedures used by schools for their own purposes and in preparation for the examinations in summer 2004. Although some evidence was found about the preparation by pupils for the early examinations in Year 11, the survey does not deal with the first wave of GCSE examinations, which took place after its completion.

114. The teachers' understanding of the double-award course specifications varies considerably. There is a need for further guidance about the range that should be covered in the eight new courses, the depth of treatment and the teaching of subject matter within realistic vocational contexts.

Interpreting the subject specifications

115. Teachers and schools generally find the administration procedures for the awarding bodies' assessment requirements manageable. Teachers' understanding of assessment procedures and their confidence in using them has improved during the period of this survey. Those teachers in schools with experience of GNVQ courses are generally more secure in their procedures. Assessment confidence and practice, however, need to be improved further to bring them overall to the levels found in longer established GCSE courses.

116. Teachers who have experience of GNVQ courses or who have attended training courses run by the awarding bodies are furthest forward in their understanding of the specifications. In most subjects, teachers have been able to interpret the specifications to create effective teaching units. Thus in health and social care, for example:

> *Most teachers had converted specifications into clear assignments. Pupils' achievements in the assignments seen for Unit 2 were generally good: the assignments had provided them with opportunities to apply health issues to case study characters.*

117. Some difficulties with specifications need to be resolved in specific subjects, for example, in applied business. Here, although most elements of the specification are clear, some of the requirements for pupils to demonstrate analysis and evaluation, are unrealistic, given the limited data available to pupils and their stage of development. For example, in Unit 1 pupils are required to provide:

> *A detailed analysis of how organisations' activities may need to adapt in order to ensure that their aims and objectives continue to be met over time and to produce a detailed assessment of the importance of location choice on overall organisational performance.*

The difficulties in obtaining data and information to fulfil this requirement result in pupils making statements which are unsupported by evidence. Also, the specifications in Unit 1 sometimes lead pupils to engage in too much descriptive work.

118. The GCSE engineering specifications separate designing (Unit 1) from making (Unit 2). Many schools have inferred from this splitting that the units should best be taught separately. In practice, completely separating the teaching of the two units makes it very difficult for schools to comply with the National Curriculum programme of study for D&T which Engineering has been planned to cover. This is because, in D&T, pupils are expected to be able to test the effectiveness of their designing by making and then using the products they have designed in order to determine how well they work in reality. Such experiences are uncommon in the engineering courses observed so far where Units 1 and 2 are taught separately.

119. The specifications for leisure and tourism give cause for concern. They are ambitious in covering the breadth of both the leisure industry and the travel and tourism industry, and this is leading to an insufficient coverage of either. The specification states that the links between the leisure and tourism industries should be highlighted rather than delivered as separate topics within courses. However, the specifications are written clearly under two separate sections 'The Leisure Industry' and 'The Tourism Industry' and this is frequently how they are taught. Furthermore, the specifications are over-complex and sometimes inconsistent. There is a need to review these issues and to acknowledge progression routes, post-16, to the two fields of leisure and recreation, and travel and tourism.

120. A further issue arising from the interpretation of the specifications is the extent to which they are developed by schools into courses which are broad and deep enough in their coverage to justify a double-award GCSE. The quantity and level of demand of material in the specification for applied science and its interpretations by schools are entirely commensurate with a double-award GCSE. There is plenty in this course to challenge the more able and to give credibility to the A* grade. In some schools in other subjects, too, the extra time has clearly led to greater depth, breadth and vocational awareness. However, in all of the other subjects, in some schools it is difficult to see what added value has been accrued through the allocation of double time.

121. Many of the pupils interviewed by inspectors feel that the double-award courses they study are as difficult as their other GCSE courses but, with the exception of applied science, they do not believe that the amount of work required is as great as that required for two separate GCSE courses. This is particularly evident in schools which have chosen to teach the course in less

than double-award time and those which give pupils insufficient practical experience of the world of work as a fundamental part of the course.

122. More specifically, in GCSE engineering there is a growing and justified concern that the course specification encourages pupils to learn to write about engineering rather than to learn by practising engineering. The marks awarded for making products in one awarding body's specification are currently very low at 15% of the total of the Unit 2 portfolio; they are reportedly to be reduced to zero next year as pupils will by then be marked on their evaluations of their products rather than directly on the skills shown in the making of the products.

123. Awarding bodies have responded to the need for more guidance on assessment by issuing samples of assessed assignments in courses including applied business, providing feedback to teachers on draft assessments and providing training courses. Teachers' knowledge of assessment requirements, both coursework and externally set assignments and examinations, improved markedly from an understandably fairly low base in each subject during the period of this survey. Even so, many are still uncertain about the criteria for marking and the standards expected at each level. For example, teachers of applied science find the guidance from awarding bodies on assessment of coursework difficult to interpret. Some take a literal interpretation of criteria, such as 'identify the industrial importance of the products', without considering what might be expected, for instance, for a C grade.

124. An important issue is the extent to which support and guidance should be given to pupils about their coursework. Some teachers believe that there should be minimal intervention; others collect first efforts, grade them with annotations about errors and shortcomings, and return them to pupils for further improvement. Consequently, outcomes in relation to other evidence on pupils' attainment range from the very weak to the flattering. Sometimes, pupils' attempts at coursework are simply filed, to be marked later in the course; pupils receive no early feedback on the strengths and weaknesses of their work and teachers are missing the opportunity to monitor progress. Some teachers are shelving serious problems for later on in Year 11. Unless this is rectified, it is likely that the generally good achievement of many pupils will not be properly realised in their coursework. Teachers of these courses often lack well-developed professional procedures for supporting pupils as they hone their coursework.

The monitoring of pupils' progress

125. The monitoring of pupils' progress varies widely. Where it is good, clear procedures are used to give pupils regular feedback and encourage them

to review their own progress as this example of good practice from leisure and tourism shows:

Baseline data from Year 9 National Tests provided a predicted target grade for each pupil. This was used as a benchmark against which to measure individual progress and to feed back to pupils in a report twice a year. These regular tests were set to assess work covered in Unit 1. They were set to GCSE criteria and marked in line with sample awarding body marking schemes. Pupils had individual working files and assessment files. They built up portfolios of evidence in each unit covered, although there was no requirement to do so for Unit 1. These included a number of key assessments which were often detailed case studies, frequently linked to visits or practical experiences. Marking schemes were provided so that pupils could manage their own self-assessment. In addition, there was a pupil handbook to deal with the aspects of customer care and marketing covered off-site; this included a weekly record of progress which the pupils filled in. It also focused on attendance, an ongoing diary and weekly record and achievement sheets. A bronze, silver or gold certificate was awarded at the end of the course for a combination of attendance, attitude and achievement. The document also had a section to carry out a review and self-evaluation of progress against an action plan. Pupils were also asked to evaluate the course content, structure and delivery. The survey revealed that the pupils were very positive about the course. Feedback from teachers on assessment pieces was specific in suggesting ways in which a particular section or piece of work could be improved.

126. Teachers' marking of pupils' work generally reflects the marking guidelines, although the diligence with which this is carried out varies with the quality of the teaching. Teachers often provide fair written feedback in enough detail for pupils to identify how to improve their work. Most pupils are able to re-submit their work to enable the mark to be improved in order to achieve their target grade. In most schools visited, individual target grades are set for each pupil which are based on previous Year 9 National Test results plus other data that is available. These targets are reviewed and progress against them is monitored regularly, usually by subject teachers and tutors. Individual pupils' progress is monitored against the targets. In most schools, teachers do not make adequate use of short-term targets.

127. In most schools there is very limited assessment of key skills in the GCSE courses. There are many opportunities for the development of key skills in the courses but these are rarely planned for or systematically taught in the courses.

Leadership and management

128. At best, the introduction of the new GCSE courses is highly effective and well supported by school senior managers. This is rare, however, and is generally more evident in schools with a successful track record in providing vocational courses.

129. Usually schools that are effective in this way have a senior vocational education or work-related learning co-ordinator with sufficient authority to ensure the effective management of change. This has been particularly important in ensuring that:

- school timetables have been adapted to enable the vocational elements of the courses to be run effectively
- pupils, parents and staff are well briefed and encouraged to view vocational courses as valuable additions to the school curriculum
- teaching staff have adequate time and resources to prepare for the courses and to build effective working relationships with partner organisations such as FE colleges.

130. This high level of coherence has so far only been achieved in a minority of schools. More generally, even where the courses are well supported by senior managers who see them as means of broadening the curriculum, making it more relevant to pupils and raising standards, they are rarely integrated into a wider programme of work-related learning or its constituent elements such as work experience, the running of mini-enterprise activities or clubs such as Young Engineers. This missed opportunity is partly due to the course specifications but it is also a management issue. Work experience is often organised in isolation from vocational courses and its timing and the nature of placements means that it can rarely be used directly in coursework. As an exception, in one school, all vocational education including work experience was managed in one faculty. Pupils' work experience was matched to their vocational course unless they wished to experience a different vocational area.

131. In some schools, the implications of running new GCSE courses have not been adequately thought through by senior managers. They have not conducted a sufficiently rigorous audit of needs before introducing the courses, or of the capacity of the school to run them effectively. They have not constructed a timetable to enable vocational visits or courses taught jointly with FE colleges or training centres to work effectively or always allocated appropriately qualified teachers to course teams. The time required to arrange and administer such external partnerships is considerable but has rarely been quantified. Very few schools deploy

administrative staff, as FE colleges often do, to carry out the duties of arranging, for example, industry visits.

132. Few schools monitor the effectiveness of the teaching of vocational courses, even those with well-developed performance management systems. Even fewer have carried out an evaluation of the introduction and impact of the new GCSEs. In a significant minority of schools, the decision to run the course for the first cohort has been taken rather late in the academic year. This was sometimes because they were confused about whether GNVQ courses would run alongside, or be replaced by, the new GCSEs. This, together with the late arrival in schools of materials about the courses from the awarding bodies, has reduced the initial capacity of teachers to plan effectively.

133. A number of teachers feel that the new courses have been foisted on them by senior managers as part of a broader move to develop vocational education in the schools. In one school, the course had been clearly set up principally as a means of containing low achievers, many with challenging behaviour. This decision has now been reviewed. In contrast, senior managers and heads of science departments have identified the applied science course as a solution to a problem: how to promote achievement in a compulsory subject with pupils mainly of middle to low ability who respond better to coursework than to examinations. Within some of these science departments, leadership of the new courses has been very successfully delegated to talented staff at developmental stages in their careers who are keen to win their spurs through success with a new venture.

134. With few exceptions, notably in leisure and tourism, the introduction and running of these new courses have been soundly or well managed by subject departments. They have carried out adequate planning and produced at least workable schemes of work, often in conjunction with partner organisations, developed interesting assignments and promoted health and safety in practical lessons. A major weakness has been the planning and provision of suitable vocational experiences for pupils. In many cases, teachers work in isolation, with little monitoring or support from heads of departments and senior managers.

Staffing and staff development

135. Most teachers of the new courses are enthusiastic and committed. However, many lack relevant or up-to-date vocational experience and very few professional development opportunities have been available to them to obtain it. This considerably restricts the vocational relevance and effectiveness of their teaching.

136. Teachers are mainly adequately qualified or experienced in the academic sphere of their subjects in applied art and design, business, ICT and science. However, the proportion of those with recent and relevant vocational experience varies among subjects. Most art and design teachers are qualified in fine arts and very few have worked directly in the arts-related industries. The more enterprising departments have partly ameliorated this by bringing designers and artists into schools to talk to pupils. In applied business, most schools are adequately staffed by qualified business education teachers, a substantial proportion of whom have recent and relevant business experience which most successfully draw on to enliven their teaching. In applied ICT, teachers are usually competent in ICT but most lack recent experience of working in business or industry settings and up-to-date knowledge of current practice. All of the applied science courses seen are staffed by teachers with very good and sometimes excellent subject knowledge who value the opportunity to present science from a new perspective.

137. The staffing of the other subjects is more complex and patchy. In engineering, most of the courses are adequately or well staffed by teachers, FE lecturers or trainers. These lecturers and trainers often have excellent subject and vocational expertise but some struggle to teach pupils in the 14–16 age range with the necessary authority. Some of the school D&T teachers who teach engineering or manufacturing have relevant industrial experience and find the new courses have given them refreshing opportunities to draw on this in their teaching. However, most of them need updating to come to terms with modern industrial practices. Half of the schools visited for health and social care have teachers with a strong background in these areas, but a quarter of the teachers had not received any recent updating in current legislation and issues in care settings. Few have a background with children in their early years or in science or social science. Those who do not have care experience tend to be home economics, physical education or social science teachers. They have rarely engaged in professional development to increase their knowledge of the health and social care sectors. The majority of those teaching leisure and tourism are geography teachers with no, or very little, experience of teaching vocational courses. Frequently, since only small

numbers of pupils are taking this subject, only one teacher may be responsible for planning and teaching this course. This leaves many schools vulnerable to the vagaries of staff absence or turnover. Where staff have left, discontinuity has occurred and, in some schools, the course has had to be abandoned.

138. There is a shortage of opportunities for continuing professional development for the teachers of these courses, and the time for them to take part in such development. In addition, the beneficial teacher support networks, which have grown in small ways in a few areas, are underdeveloped.

139. Technician support is required for the practical elements of some of these courses. This is generally good in applied ICT, and science, adequate in applied art and design, engineering and manufacturing, and usually better in FE colleges and training providers than in schools. Few schools have begun to use the changes made possible by recent workforce reforms to give administrative support to teachers in such time-consuming tasks as running effective links with industry.

140. Most schools support teachers to attend training courses run by the awarding bodies to enable them to understand the requirements of the new courses. Teachers found the introductory courses useful but would welcome more training in the assessment requirements and standards of attainment of the courses, together with exemplification materials. Most teachers require more guidance and experience in assessing pupils' attainment in these new courses in order to reach the levels of confidence and competence found in assessment in more established GCSE courses.

141. Teaching staff in FE colleges and training providers, in the main, need training to help them improve their capability to engage pupils in the 14–16 age range.

Resources and accommodation

142. Schools started these courses with few dedicated learning resources but these are gradually being developed. There is little evidence that serious consideration has been given to how school facilities can be adapted for the effective teaching of vocational GCSE courses in the light of the government's plans to upgrade secondary school buildings.

143. Although many schools are using books and equipment that are not suitable for vocational work, many others – formerly involved in GNVQ courses – have built up banks of resources which are readily adaptable to teaching the new GCSE courses. These are gradually being supplemented by increasingly available and useful materials produced by commercial publishers and other organisations such as sector skills councils, using DfES funding, for example in engineering.

144. Most schools' art and design departments are adequately resourced for the basic elements of the course. However, few have the flavour of vocationally oriented provision through, for instance, appropriate display, book and journal resources or readily available computers. Visits to galleries are an underdeveloped resource. On the whole, the school–FE college partnerships provide a much more authentic view of the sector.

145. Course-specific textbooks were lacking in most subjects when the new GCSEs started. They are now more widely available and most schools have purchased sets but there are rarely enough for all pupils to be issued with a personal copy. Schools make substantial use of materials freely available on the internet, but pupils are often not guided or required to be sufficiently discerning and evaluative when selecting and using information gained in this way. Some good commercially produced interactive multi-media resources are available but they are expensive. Given the difficulties in establishing business links, there are few high-quality computer-based business simulations and case studies. Schools have sufficient ICT hardware and software but access to this is often limited especially for pupils studying applied art and design, health and social care, and leisure and tourism courses.

146. Accommodation for the new courses varies very widely. Some of the jointly run courses are taught partly in excellent FE or training company facilities. In contrast, in around one fifth of schools, courses like leisure and tourism do not even have a permanent classroom base. This nomadic existence considerably restricts teachers' ability to use resources effectively. However, some schools have developed good permanent bases, as in this example:

One health and social care course was taught in its own learning centre with dedicated computers. The centre provided excellent accommodation with furniture which could be moved easily to enable whole-group or small-group activities to take place. The walls of the room had well-presented displays of pupils' work and posters relevant to the topics being studied. The room layout enabled some lessons to be team taught. This helped the teachers to provide close support to pupils with additional learning needs.

147. In the main, pupils are being taught these vocational courses in existing accommodation which was designed for different purposes. The survey provides little evidence, nationally or locally, of initiatives to draw up design specifications for the kinds of accommodation which are appropriate for the new and developing courses.

External links and support

148. Schools which have good links with industry to support their teaching of the new GCSEs are in a minority.

149. Schools with well-developed business links have painstakingly built them up over a number of years, usually because they have a long tradition of providing vocational courses, for example:

> *The school had built up external links over the 13 years of its existence and these were being used well in the applied business course. Pupils had visited a small joinery company early in the programme to gain an overview of the whole manufacturing process from the input of raw materials to marketing and retailing. The relatively small scale of the operation had helped pupils understand the functional areas of business such as production, marketing and finance and the inter-relationship between them. The business experience was then used as a case study in subsequent lessons using e-mail contact and visits made to the school by the owner.*

150. Often where links with employees are thorough and effective, and where well-structured visits are routinely made by pupils, too much of the necessary preparation, planning and communication work has to be done by teachers in charge of the new GCSE courses. Few schools consider deploying administrative support staff to aspects of this valuable but time-consuming activity.

151. When arranging links with industry, many schools find a poor response from companies, especially the small and medium-sized firms who do not have enough time or staff to meet schools' needs. In some areas there is a lack of appropriate businesses available.

152. LEAs are very rarely involved in the creation of links between schools and businesses for these new GCSE courses. There is little evidence of other groups making a significant contribution to the forging of such links to enrich the vocational dimension of the courses. A few informal local support networks have been set up and these are greatly valued by teachers as a practical way of exchanging ideas. Effective and widespread communication and support partnerships between schools have yet to emerge to support the new GCSE courses. Most schools currently work in isolation from each other although, as noted elsewhere in the report, well-managed liaison with FE colleges and training centres does give rise to valuable jointly taught courses. The following is an example from one engineering training centre:

The centre provided good-quality facilities for associated companies for training at modern apprenticeship level and above, together with the recruitment, testing and selection of trainees. Its good range of traditional and modern resources covered basic engineering craft, computer-aided designing and manufacturing, rapid prototyping, welding, craft electronics, materials handling, health and safety, ICT, supervisory skills, marketing and finance. All trainers, including those who work with school pupils, had recent and relevant experience of the sector. The centre arranged for the pupils a number of purposeful industry visits to the companies with which it was associated representing a wide range of electro-mechanical engineering practice.

153. In most cases, links between schools and awarding bodies take place through formal training courses, the provision of written guidance and in responding to queries from schools. Schools report that they miss the contact with external moderators, a feature of GNVQ courses that provided advice as well as moderation of standards.