

IMPROVING Technology and Design

in Post-Primary Schools

2001

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*The Education and Training Inspectorate -
Promoting Improvement*



INVESTOR IN PEOPLE

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A number of quantitative terms are used in the report. In percentages, the terms correspond as follows:-

More than 90%	-	almost/nearly all
75%-90%	-	most
50%-74%	-	a majority
30%-49%	-	a significant minority
10%-29%	-	a minority
Less than 10%	-	very few/a small number.

INTRODUCTION

The findings in this paper are based on inspections of and visits to technology and design departments in post-primary schools during the period 1996-2000.

1. Strengths

- 1.1 Since the introduction of the Northern Ireland Curriculum, the majority of the .670 teachers of technology and design have worked hard to implement the programme of study. The subject is established firmly in those schools which have achieved good results in public examinations.
- 1.2 The majority of teachers have a strong sense of loyalty to their school, relationships among them are good, they work well together within their subject department and for the most part, they endeavour to contribute to the development of the subject in a constructive and self-critical manner.
- 1.3 The majority of teachers are conscientious, hard working and determined to do their best to support the pupils. The new facilities provided through the Education Reform Programme, have in general, improved the range and variety of the pupils' experiences in technology and design and have raised the morale of both the pupils and the teachers.
- 1.4 The majority of teachers enjoy good relationships with their pupils, who are well motivated when using machinery, tools and materials to create products which are valued by their peers and their parents.

- 1.5 In a majority of technology and design lessons, there are either significant strengths or the strengths outweigh the weaknesses: such lessons are well planned, the teachers have realistically high expectations of the pupils and take appropriate account of their prior knowledge of the subject, the teaching is effective, the learning is secure and the pupils achieve good standards in their work.
- 1.6 A minority of technology and design teachers use a range of learning and teaching strategies including whole class, paired and individual work; they achieve an appropriate balance between practical and theoretical work and set and maintain challenging, interesting and motivating tasks.
- 1.7 By the end of key stage 3 (KS3), a minority of pupils are competent and confident to design and manufacture technological products to a good standard in both selective and non-selective schools. The same number of pupils, approximately, can use information technology effectively to communicate graphically their design ideas and to control their technological products. A majority of pupils at KS3 have a sound understanding of the function and operation of basic electronic components even where they lack the practical skills to realise their ideas through design and manufacture.
- 1.8 The use of computers in technology and design is increasing each year exponentially. In the main, computers are used to handle and present information graphically, to formulate, develop and present ideas and to control the pupils' products. Increasingly at KS4, the pupils are using effectively programmable integrated chips to control the function and operation of their main GCSE projects.
- 1.9 About 80% of technology and design teachers are suitably qualified and trained. The remaining 20% of teachers have insufficient health and safety training for basic workshop practice.
- 1.10 The accommodation for technology and design is good and in line with the Building Handbook in 85% of schools. The schools report that improvements in accommodation and resources provided by the Education Reform Programme have generally supported curricular developments.

2. Areas for Improvement

- 2.1 While the quality and standards of lesson planning continue to improve as the teachers become more confident in their understanding of the subject requirements; the holistic nature of the subject, and the importance, particularly at KS3, in planning for the single attainment target - technology and design capability has yet to be realised.

- 2.2 Generally, the teachers' individual planning for lessons and topics is sound for subject content but does not take sufficient account of the ability, interests, motivation and needs of individual pupils. Consequently, only a small majority of the pupils in year 10 are enthusiastic about the subject and most of these are boys: about 17% of the girls continue with the subject at KS4.
- 2.3 In 50% of schools, effective use is not made of the planning and systems rooms. In these schools some of the pupils are permitted to engage in sedentary planning activities in the manufacturing rooms while other pupils are engaged in practical manufacturing activities. In these circumstances the potential safe use of the facilities is compromised.
- 2.4 In a minority of the technology and design lessons, the weaknesses outweigh the strengths or there are significant weaknesses. In these lessons, the teachers' expectations of the pupils are too low, the teaching is often unstimulating and does not take account of the pupils' abilities and interests, consequently, the standards which the pupils achieve fall considerably short of their potential.
- 2.5 In a majority of schools in KS3, problem solving through design activities is significantly underdeveloped. While there has been significant improvement in the standards of graphic communication skills at all levels, the standards generally are not good enough. For the most part, the pupils write at length to express ideas which should appropriately be formulated and developed through annotated sketched and formal drawings.
- 2.6 In a majority of schools at KS4, the development section of the design of the pupils' major GCSE project is not systematically and progressively refined and extended enough to demonstrate sustained and justified improvements in the function and aesthetic appeal of products.
- 2.7 The use of metal as a constructional material is significantly underdeveloped at KS3 and KS4, consequently, a large proportion of the resources representing at least 40% of the cost of provision including machinery, tools and equipment is significantly underused.
- 2.8 Over the past ten years, the Education and Library Boards have provided a range of safety training courses in the use of machinery, tools, specialised equipment and processes. While the provision of the programme of support has made a significant contribution to the teachers' confidence in the subject, the quality of provision across the five Boards is uneven and incomplete.

3. Priorities for Action

Given the areas of weakness above, and to promote further improvement in teaching and learning in technology and design there is a need to:

- 3.1 improve planning holistically to take account of the pupils' technology and design capability;
- 3.2 plan more carefully to meet the abilities, interests, motivation and needs of individual pupils and monitor and evaluate the effectiveness of planning revisions;
- 3.3 plan the effective use of the systems and planning rooms;
- 3.4 evaluate the pupils' design and communication skills frequently and regularly to ensure that at the end of KS3, they can work independently to good effect;
- 3.5 enhance significantly, at KS3, the provision for the development in the pupils' design ideas;
- 3.6 incorporate the use of metal as a constructional material in each year at KS3;
- 3.7 enhance significantly the collaboration between the teachers of technology and design and science and their counterparts in primary schools;
- 3.8 ensure that the health and safety training for teachers is consistent with the requirements to use machinery and tools in schools;
- 3.9 continue to effect improvements in the accommodation, level of computer resources and technical support for technology and design teachers.

CONCLUSION

Schools and the Inspectorate recognise the importance of self-evaluation as a basis for improvement and development. It is intended that this publication, and the publication 'Evaluating Technology and Design', will support technology and design teachers and departments in their evaluation and improvement of their teaching and of their pupils' learning and standards of achievement.

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