Current practice and future needs in Design and Technology in the secondary sector

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Current practice and future needs in Design and Technology in the secondary sector

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Abstract

Implementation of the National Curriculum Key Stage 3 has been underway since the autumn of 1990. Key Stage 4 will be phased in from the autumn of 1993. Some schools and colleges in the secondary sector are adapting to the new demands, while others are still planning, or just waiting. This paper attempts to summarise the situation as viewed by teachers who responded to a survey conducted in the spring of 1991.

The survey focussed on four areas of interest:

*   *organisation;*

*   *Curriculum;*

*   *planning;*

*   *in-service training.*

It was carried out by analysis of a questionnaire largely based on National Curriculum documents. The questionnaires were completed by Heads of Faculty or Department in the broad range of secondary schools and colleges in the Leicestershire Education Authority.

The observations presented in this paper should be of interest to all those involved with strategic

Introduction

Following the introduction of the National Curriculum Key Stage 3 in schools during the autumn of 1990, there is considerable interest to know how schools have adapted to meet the new demands and how they perceive the immediate future. This paper presents some of the findings from a survey of Leicestershire schools and colleges conducted by questionnaire in the spring of 1991. The questionnaire was mailed to all of the secondary schools and colleges in the authority, for completion by their respective heads of faculty, or department, and these findings represent an analysis of a 50% rate of return.

The survey questions were based on National Curriculum documents available to schools, principally the Non-Statutory Guidance (1), and were focussed on four main areas of interest:

*   structural organisation;

*   curriculum;

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*   development planning;

*   professional development.

Observations about current and future practice in the contexts of Key Stages 3 and 4 were expressed by the respondents, but this paper reports with confidence only upon current practice since it is clear from the returns that the future, at the time of response, was still clouded with uncertainty.

Structural Organisation

The Leicestershire Education Authority embodies a range of schools in secondary education, all comprehensive, arising from amalgamation of three former authorities in 1974. A coding system is used here to define the types of school that responded to the survey. Table 1 shows the schools, their age ranges and codes. Table 2 shows the proportions in the authority responding to the survey, the numbers on roll at the time of enquiry and the proportions of student numbers in the survey. It is, perhaps, instructive to compare these proportions with the proportions of teachers represented for each type of school and for each subject discipline defined by the National Curriculum Council. (NCC). These statistics are presented in Table 3. Interpretation, however, should be tempered by an inter-disciplinary overlap that most schools found difficult to resolve.

Table 1

Types of school responding to the survey

Secondary Schools	Age Range	Key Stage	Code
High Schools and Community Colleges	10/11-14	3 only	H
Secondary Schools and Community Colleges	11-16	3 and 4	S1
	11-18	3 and 4	S2
Upper Schools and Community Colleges	14-18	4 only	U
Special Schools	3/11-16/18	3 and 4	Sp

Table 2

Proportions of response and numbers on roll in the schools surveyed

Code	Field	Response	Schools	%	NOR	% NOR in survey
H	36	14	39	7	638	23
S1	19	9	47	6	521	20
S2	9	5	56	5	133	15
U	16	13	81	13	482	41
Sp	16	7	44		474	1
Total	96	48	50	33	248	100

Table 3

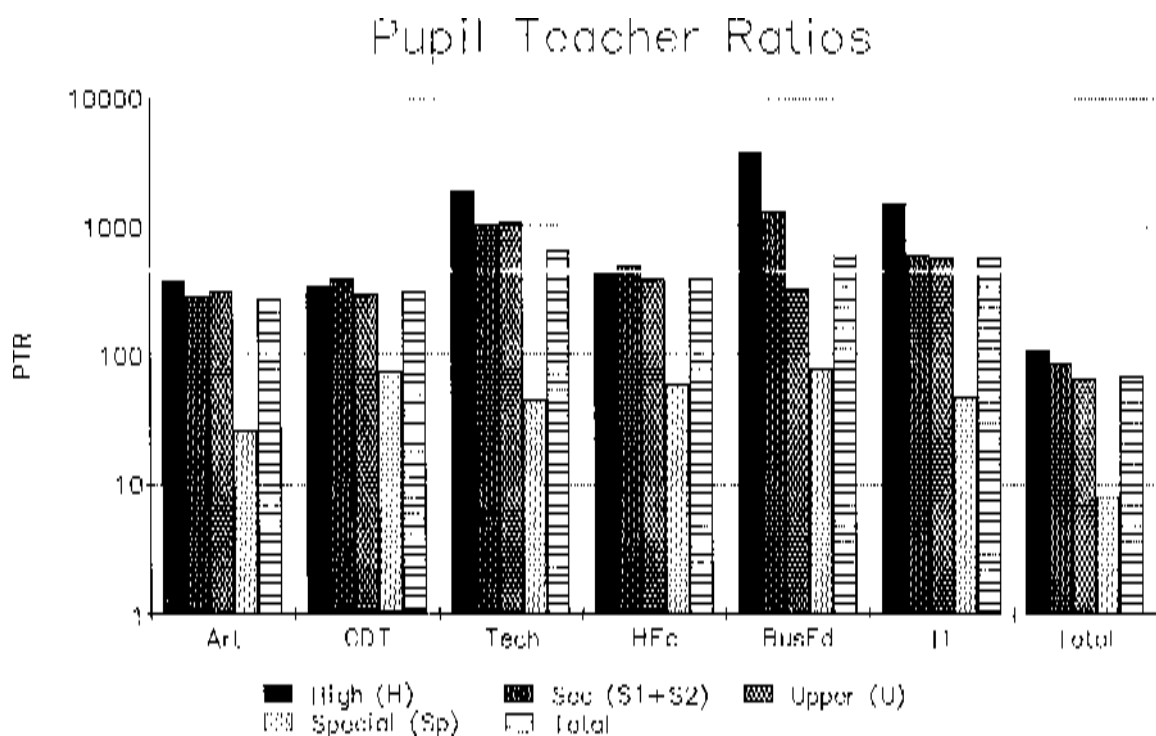**Numbers and proportions of teachers represented in the survey by school and by subject discipline**

Code	Art & D	CDT	Tech	HEc	Bus Ed	IT	Total	%
H	20.3	22.5	4	17.4	2	5	71.2	15
S1	24	19	19	14	3	10	89	19
S2	17.5	13	5	10.5	4	8.5	58.5	12
U	46.5	44	13	34.5	40	23.5	201.5	42
Sp	17.83	6.33	10.3	8	6	10	58.5	12
Total	**126.13**	**105**	**51.**	**84.4**	**55**	**57**	**478.7**	
%	26	22	11	18	11	12		100

Key:
- Art & D - Art & Design
- CDT - Craft, Design & Technology
- Tech - Technology
- HEc - Home Economics
- Bus Ed - Business Studies
- IT - Information Technology

Setting aside the degree of ambiguity surrounding the subject labels, it is evident from Table 3 that experience in Business Studies is significantly lower for KS 3 institutions than for institutions with KS 4 only. The evidence is further amplified in Figure 1 which illustrates pupil teacher ratios (PTR) for each type of school and for each subject discipline. The difference in ratios between KS 3 only and KS 4 only is a factor which is greater than 10 to 1. To a lesser extent, similar observations may be made for IT and Technology (factors of approximately 3 and 2 respectively), but these remarks are subject to more scrupulous analysis of influences upon staffing levels, such as timetabled provision, non-contact time, numbers of post-16 students and teachers' interdisciplinary skills.
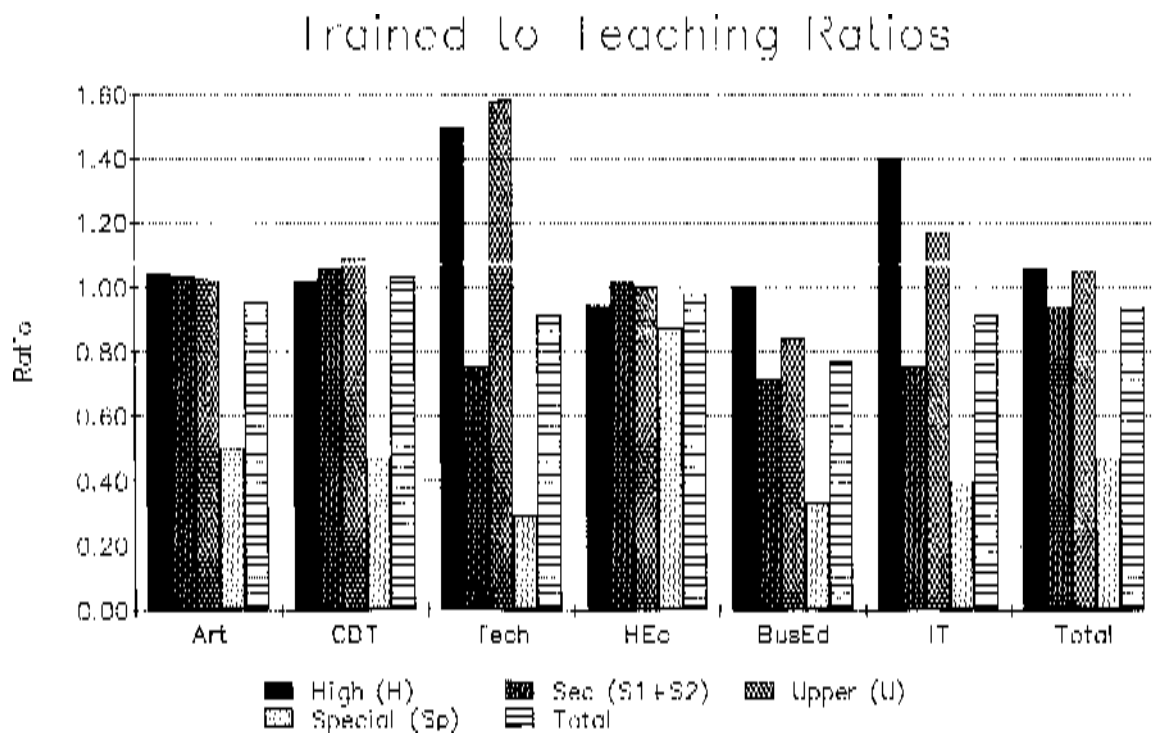
Figure 1

An attempt was made to gauge the relevance of the latter influence by assessment of the use to which teachers initial training is put in deployment of skills in schools. Figure 2 shows the ratio of trained, or very experienced, teachers to practicing teachers in each discipline. A ratio less than 1 suggests a deficiency of appropriate teachers while a ratio greater than 1 would tend towards either a surplus or underuse of skilled teachers. Taken with Figure 1, the evidence might indicate a low level of activity for Business Studies, IT and Technology in High Schools (KS 3 only). There would appear to be an acknowledged shortage of these skills in Secondary Schools implementing both KS 3 and KS 4. In Upper Schools (KS 4 only), it may be surprising to note that the average of 1 technology specialist per school is more than required, whereas the 3 Business Studies teachers per school may not be sufficient.
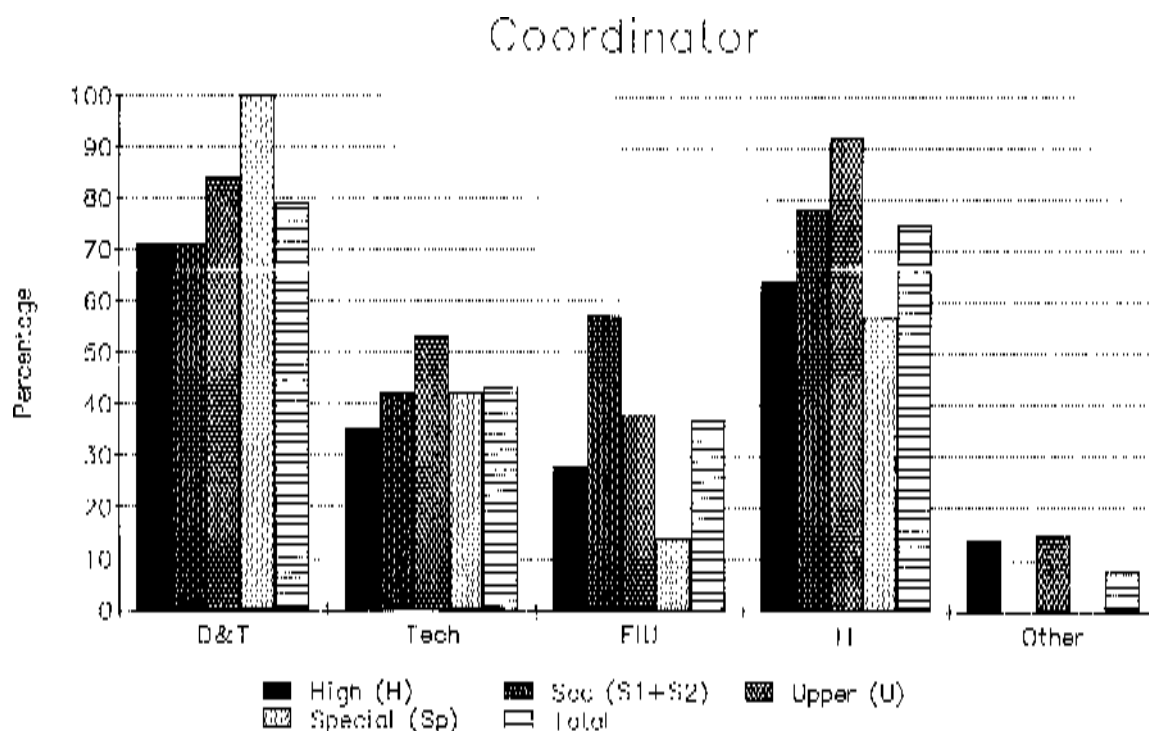
The low ratios in all disciplines for Special Schools reflects on their necessarily low PTRs and their broader, yet specialised, curricular and pastoral skills training for teachers.

With respect to departmental organisation, there is a general preference (2 to 1) for the separate subjects to be coalesced into a single faculty rather than a federation of individual departments. This attitude may derive from a desire to adopt a broadly based approach to students' learning, referred to later in this paper. In the light of previous observations made here, any anxieties aroused about the place of Economic & Industrial Understanding (EIU), and even Technology, are not allayed by the evidence of Figure 3. Schools were asked to identify co-ordinators for the areas suggested by the NCC. Fewer than 40% were able to do so for EIU and not many more could for Technology. 35% of the schools volunteered their plans which indicated little change.

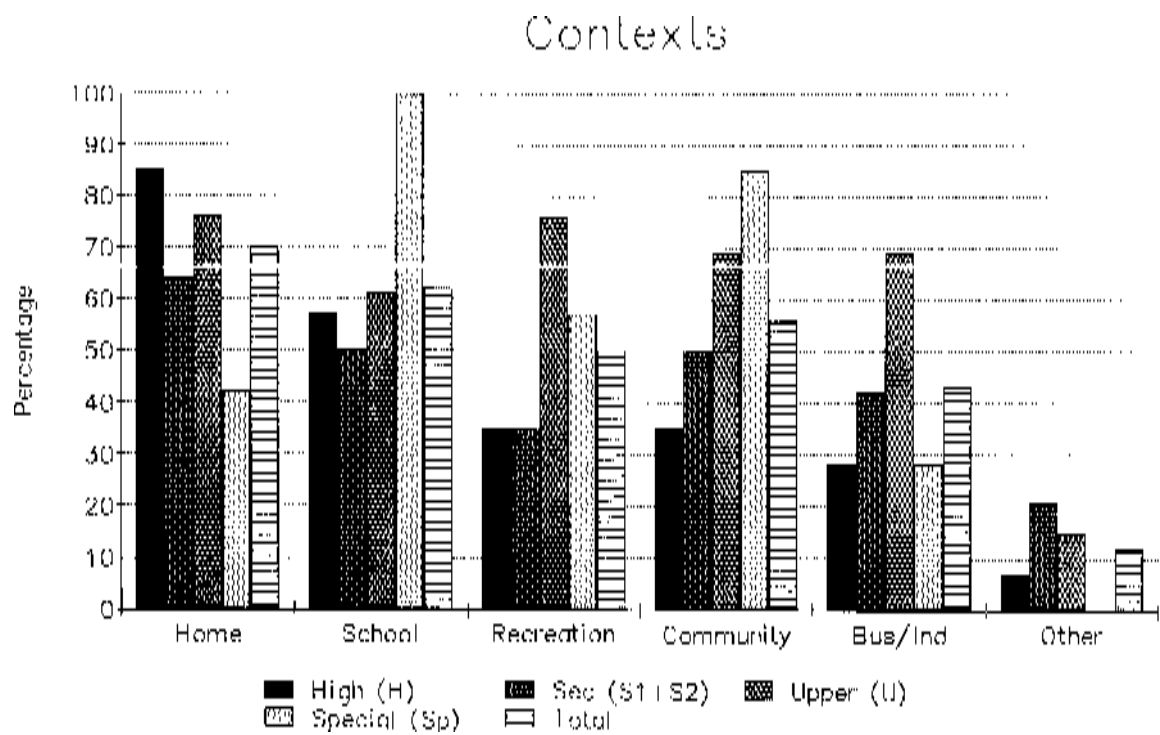**Figure 2**

Figure 3

Coordinator

Curriculum

Two thirds of the schools organise their curriculum to accommodate a thematic approach to learning. The primary arrangement is the "integrated theme" preceded by a carousel or followed by specialisation in the separate disciplines, but 25% use an integrated approach alone. The trend for those schools indicating plans (65%) is an increased integration of subjects. A slight reduction in timetable provision is anticipated, however, from a median value of 12% to 11%. Currently, 80% of schools lie within the range of 12 $\pm$2%.

Contexts, products and materials are illustrated by Figures 4, 5, and 6. 23% of schools claim to base learning in all 5 contexts and that includes only 14% of the mainstream schools with responsibility for KS 3. Fewer than 50% of these schools include activities relating to recreation, the community and business and industry.
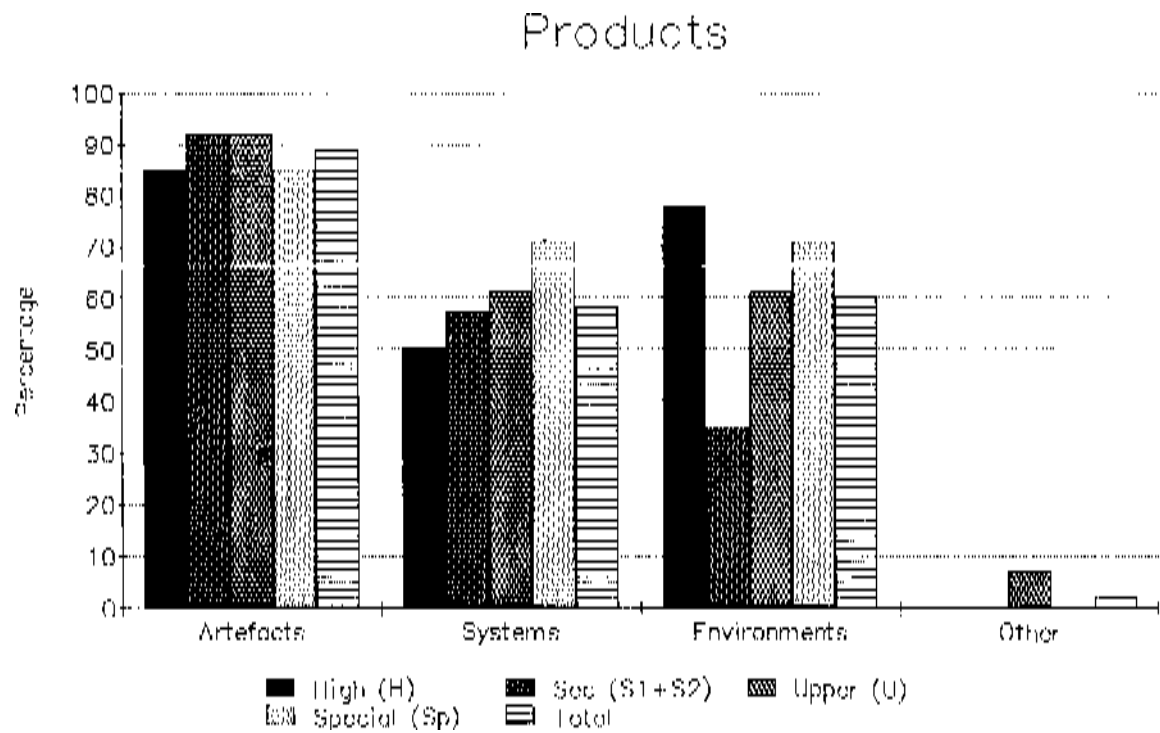
Similarly, more than 50% of these schools do not have products of work characterised either as systems or environments. All schools that responded to this question (90%) produce artefacts, but 21% produce only what they describe as artefacts. As in the case of contexts, the need to redress the balance is acknowledged by the schools indicating their plans (50%).

The scope of materials is virtually accounted for by all schools. Failure to meet 100% in some categories is due to an absence of response rather than a denial.
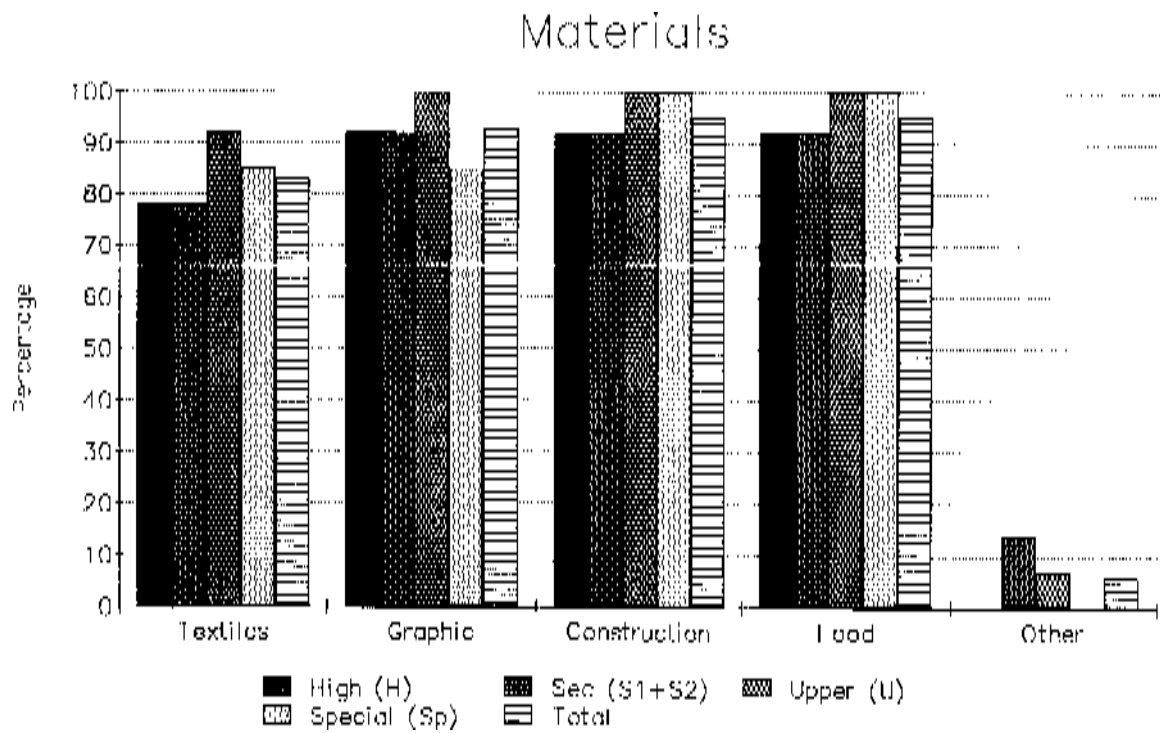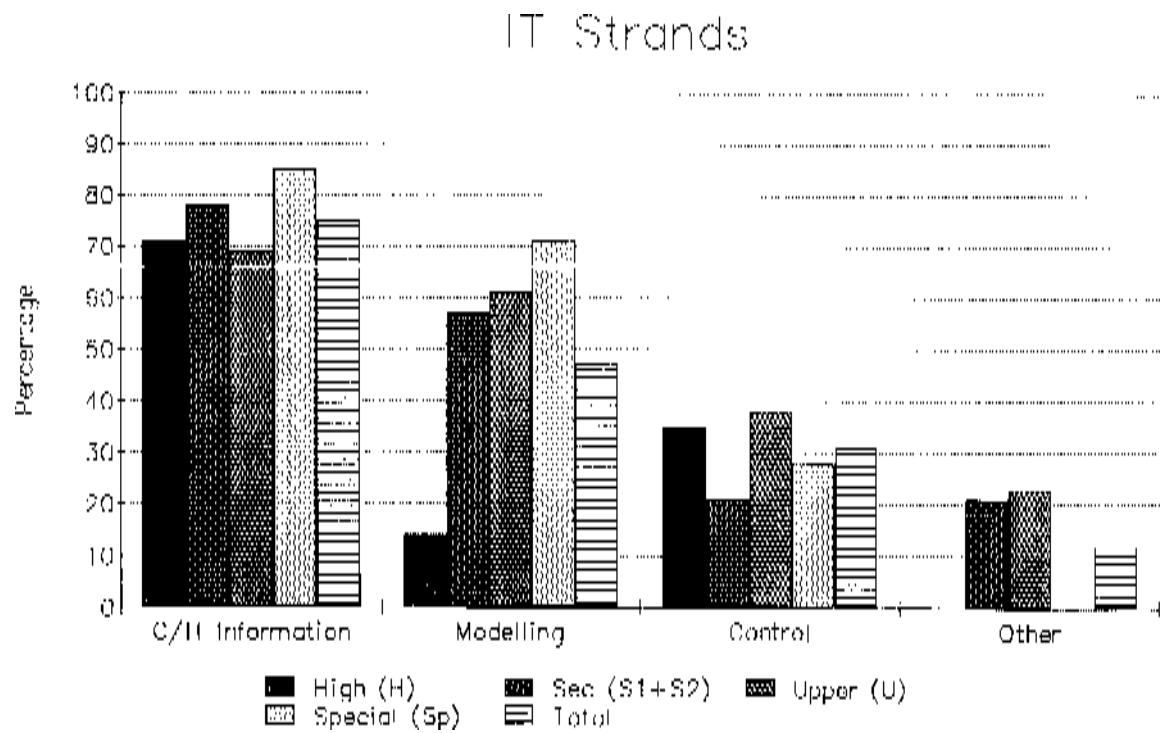
Figure 4

Contexts

Figure 5

Products

Figure 6

Materials

Figure 7

IT Strands

The response rate to enquiries about the use of information technology was 88%. From Figure 7 it is apparent that two of the three strands proposed by the NCC are not prominent in the majority of schools. Measurement and control of variables is especially weak. It appears in less than a third of KS 3 schools and very little more for KS 4. It also trails a poor third in the plans of 70% of the respondents, but modelling real and imaginary situations is projected at a level similar to that for communicating and handling information.

Quantifying EIU is more subjective, but, as might be deduced from earlier evidence, about 80% of schools admit "little" activity of which half hope to make a "significant" improvement in the future.

Development Planning

During the 12 months prior to the survey teachers averaged approximately 0.5 hours per week planning for the National Curriculum. Less than a quarter did this on a regular basis, the majority of schools using their INSET allocation and Teacher Training Days. A majority also used Directed Time, as opposed to lesson time, and a third were forced to find personal time, eg. working lunches.

Between 70 - 100% of teachers in the separate disciplines of Design and Technology have been involved in planning, with the Upper Schools inclining towards the lower end of the band. Lacking direct responsibility for KS 3 they have, thus far, limited their planning time to half that of the other schools. Indeed, two thirds of their Business Studies teachers have yet to be involved. With respect to teachers outside of Design and Technology, there seems to have been very little interest in becoming involved with the planning. Only 40% of schools have identified an "outsider". Excluding 3 schools which claim most, or all of the staff are involved, the remaining 45 schools muster between them 11 scientists, 4 mathematicians, 4 English teachers and 16 others including Vice Principals and the odd Curriculum Co-ordinator. This amounts to an aggregate of less than 1 "other" teacher per school.

Apart from Special Schools, which have a different role in this regard, 80% of schools collaborate in some form with their "feeder" or contributor schools. Less than 50% of collaboration, however, is based on departmental liaison; most of it relies on contact between individual teachers. In their planning, 4 schools already involved with KS 3 still show no intention to establish a collaborative link.
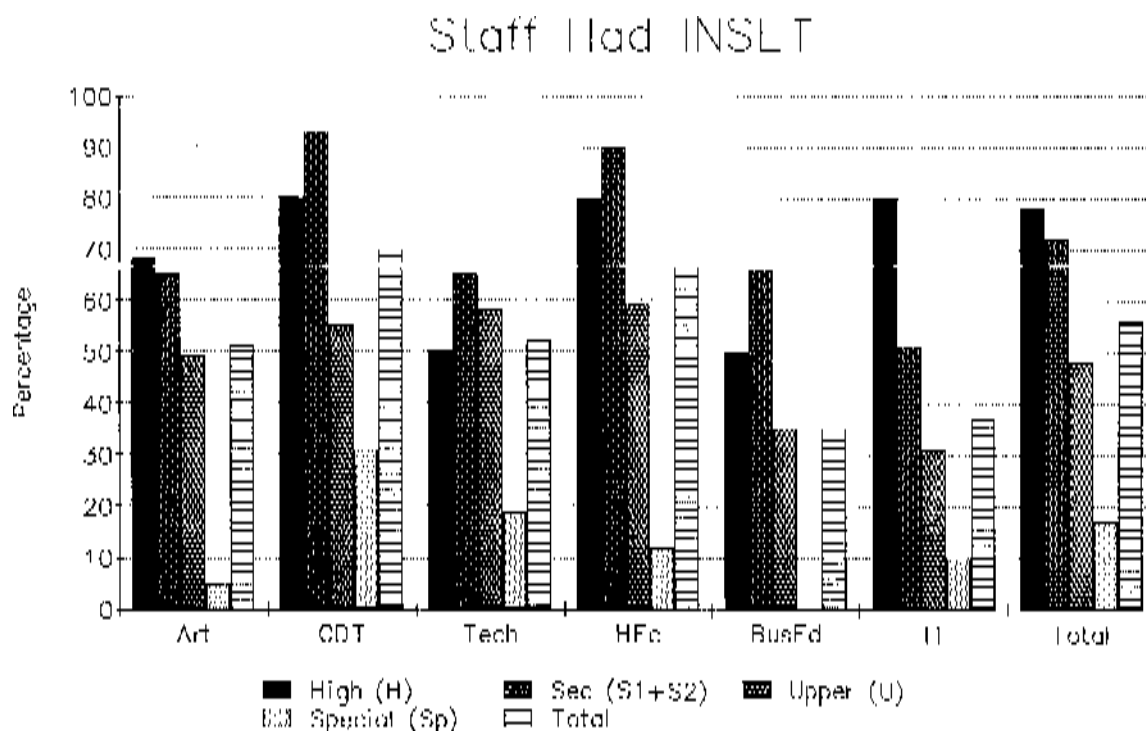
A similar situation prevails with business and industry. 20% have no direct relationship with local business concerns and 52% of schools state that they are involved in only a little collaboration. This generally takes the form of work experience, problem-solving briefs, guided tours, visiting speakers and support groups, sometimes involving the school governors. The prognosis is not optimistic since the majority do not expect to raise the profile in the immediate future and there are some schools who still do not foresee any collaboration at

all.
Professional Development

The first 3 questions posed in this section related to documents and INSET for the National Curriculum. A simple analysis of data pertaining to teachers categorised by the two Key Stages, and special needs, is presented in Table 4.

One year after publication of the two seminal documents for Design & Technology some teachers have still not seen them and 44% of teachers have not had INSET specifically related to the NC, including a quarter currently involved in its implementation and 83% of teachers in Special Schools. Further detail, analysed by subject discipline, is provided in Figure 8. Once again, the "fringe" areas of Business Studies and IT appear to be neglected and even Technology specialists are represented around the 50% level of activity.

Staff Had INSET

Figure 8
The greatest average number of days dedicated to INSET for each teacher in any one school, during this period, was 7. The general average for all types of school was 2.3 ± 0.3. The curriculum and its assessment were, and still are, the issues of highest priority among the concerns of teachers. The 7 most frequently raised issues are outlined in summary form in Table 5.

With increasing delegation of local management to schools much of the INSET activity is self-generated. Forward planning of INSET provision leads the more spontaneous variety by a ratio of 5 to 3, but continuing support for

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teachers, following specific INSET activity, is registered by only 20% of schools. Institutionally based INSET is the norm and is also regarded as the most effective in meeting the needs of schools and individual teachers. This may be attributed to a preference for the task related model for small working groups which can be tailored to a narrow specification with an identifiable outcome. Table 6 displays the preferred organisers and models for INSET.

Table 4

Reading and training for teachers in 3 different categories

Teachers who are involved with:	KS 3 %	KS 4 only %	Sp.Needs %	Total %
Proportion of teachers who have				
read the Statutory Order	94	68	56	82
read the Non-Statutory Guidance	78	66	54	71
had INSET relating to the NC	75	48	17	56

Table 5

Issues referenced for support in order of priority

Priority   Issue

54%   **Curriculum:** time for planning the structure, management and implementation of an integrated approach, balancing schemes of work with programmes of study and attainment targets

48%   **Assessment:** methods of monitoring and recording evidence of progress and achievements. SATs.

23%   **Resources:** equipment, facilities and funds for materials, consumable and otherwise.

21%   **IT:** teacher skills with regard to integration within the curriculum, and equipment.

15%   **INSET:** quality in addressing interdisciplinary themes and teacher skills. Disruption to lessons and the quality of supply cover.

13% **EIU:** integration with the curriculum. Industry links.

13% **Team building:** inter-personal and professional skills for a coherent and holistic approach to integration.

Table 6

Stated preferences for organisation and models of INSET

Organisation	Preferred (%)	Effective (%)
Institutional	50	68
Collaborative with other schools	33	35
Central (LEA)	25	62
External to the LEA	10	27

Models		
Task related working groups		58
Programmed course		31
Secondment for research		12
Industry placement		10
Teacher exchange		8

Conclusion

Clearly, the pace of introduction of the National Curriculum Key Stage 3 has provided schools with little time for adequate organisation of the curriculum, personnel and resources. There would seem to be a consensus to integrate structures for a thematic approach to the curriculum, but planning has to continue alongside implementation amidst a climate of shortfalls in specific skills and resources. These relate mainly to economic awareness and information technology.

There is substantial agreement on the needs identified for development, but strategies have to be produced from a baseline that is often limited in available time and funds for human and material resources. Major concerns expressed have to do with managing a curriculum, and its attendant pupil assessment, that does not fit comfortably with the prevailing ethos, conditions and experience. This is particularly true for Special Schools who are anxious about the relevance of the National Curriculum at all to their circumstances. Put in the contexts of the personal and social skills of the majority of their pupils, Attainment Level 1 is a sophisticated dream.

Upper Schools have considerably more time for preparation of Key Stage 4.

They are generally better resourced, both human and materially, and most have commenced preliminary planning. In contrast to High Schools, however, their concerns about the curriculum and assessment are focussed more on how they will match examination syllabuses for GCSE. One Upper School has chosen to await the outcome of developments in this area before considering any changes. Such caution may be a virtue in a volatile situation, but the lessons learned by Schools implementing Key Stage 3 might also be worthy of study for their implications for progression.

Acknowledgements

References

(1) Non-statutory Guidance: Design and Technology Capability, DES 1990

(2) Technology in the National Curriculum, DES 1990