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## Accommodating technology in schools

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## ACCOMMODATING TECHNOLOGY IN SCHOOLS

**Lewis A**

Heath Avery Partnership

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### **Background to the Heath Avery Partnership Building Study**

The Westminster Centre for Design & Technology was set up by the Independent Schools Joint Council (ISJC) in 1987 to assist all independent schools in establishing effective technology departments in line with the aims of the new National Curriculum. Many schools looked to the Westminster Centre for advice on the buildings they should provide to accommodate technology. In view of the considerable demand for information, the architects Heath Avery Partnership were commissioned by the Westminster Centre to conduct a survey of existing design and technology departments in independent schools throughout the country, and compile a manual of guidance for the design of new departments which would be helpful to heads, governing bodies and teachers of technology.

Over a period of about 12 months, Heath Avery Partnership visited technology departments in over 60 independent schools around the country, both at primary and secondary level. The survey involved assessing the virtues of each school's technology centre in terms of the building design concept, the size and configuration of the department, facilities provided and the ability of the department to adapt to meet the future needs of the National Curriculum.

The outcome of this research is the publication "Accommodating Technology in Schools", a book of 124 pages which includes the findings of the survey together with details and plans of a large number of the schools visited. Although our brief was to assess technology centres in independent schools, we recognise that the publication may also be of interest to schools in the maintained sector.

### **Lessons to be learnt from the survey**

It will be evident to those who study the examples that each school has attempted to satisfy the accommodation problems in a different way. Some of the examples (for example, Harrow, King Edward's Birmingham, The Leys School, Bryanston, Whitgift, Port Regis and Orwell Park) are major new developments involving substantial capital investments for one-off projects. Although a great deal can be learnt from these, we are conscious that many schools do not have the resources to be able to build on such a scale. Indeed, if the implementation of technology in the National Curriculum required every school to build new expensive buildings, then quite clearly this important foundation subject would never take off in the way that is intended. Costly new buildings are not essential to accommodate technology effectively.

If one examines the plans of the technology departments illustrated in our book one will immediately notice that the size of each department varies enormously. There are some very modest examples which are included precisely because the technology teaching at these schools is extremely effective and more than adequate as a starting point to enable the subject to be introduced in the spirit of the National Curriculum. The centres at Roedean, Bedford High School and Claremont Fan Court School, for example, are conversions of existing buildings and, although the accommodation is not without criticism, the departments are nevertheless very successful. In fact the high standard of work being produced at these particular schools has very little bearing on the building facilities provided. These departments are successful primarily because the members of staff have been able to motivate the pupils and generate enormous enthusiasm in the subject. No doubt in time such schools may wish to build new, improved facilities, possibly similar to the centres at King Edward's or Bryanston, but it should be stressed that in the first few years of implementation technology can be effectively taught in relatively modest accommodation.

Every technology centre will be unique and any attempt to draw direct comparisons between departments can often be dangerous and misleading. There cannot be a single building design model that will be appropriate for all schools. Much depends on the size of the school, the age of the pupils, the size of each class, the timetable and the number of teaching staff in each department. How schools

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organize their resources to implement the National Curriculum will significantly affect their accommodation needs.

## **Needs for Young Pupils**

Before discussing the ideal technology centre in greater detail, it is important to clarify at what level special facilities are required. Clearly a technology department in a junior school will be quite different from one in a senior school. For pupils in the age range of 5-11, special accommodation is certainly not necessary. The most successful place for technological activities at primary level is within the classroom with the class teacher developing the work within a cross-curricular framework. Children feel very secure in one room with one teacher they know well and with whom they have formed a good relationship. In this environment it is possible to set out a corner where the simple tools and materials required for design-and-make activities are easily available to the children. We are advised by the Westminster Centre that where schools provide specialist technology rooms for the younger pupils, these become isolated units not part of the whole learning experience of the child. Thirty five minutes per week with a different teacher is not very successful if a child is to be given the best opportunity to use relevant experiences through which to develop their technological activities.

## **Specialist Accommodation for Senior Pupils**

More sophisticated facilities and specialist rooms become necessary when considering requirements for pupils aged 11 and over. As technology projects become more demanding, it is important that pupils understand the properties of a variety of different materials and how they can be worked safely and economically using the correct tools for the designated task. Specialist equipment accommodated in a purpose-designed environment is essential. The examples of tasks and activities given in the National Curriculum programmes of study demonstrate the wide variety of materials and equipment which can be used when developing design and technology capability. Of course not all schools will have the resources to enable pupils to experience the whole range of the media suggested. Clearly it is preferably, at least in the first few years of implementation, that schools provide appropriate accommodation for a few selected activities rather than less than adequate accommodation for the whole spectrum of work given in the examples.

## **Design for Change**

The development of a new technology department will depend to a great extent on the facilities already provided in the school. Very few schools will be starting from scratch. Many have established departments which have for some time been undertaking work consistent with the requirements of the National Curriculum. It is therefore important that schools make the best use of their resources by building on these established strengths. Nevertheless, schools will need to accept the breadth of activities which can play an active part in developing pupils' design and technology capabilities. Plans to provide suitable accommodation should not therefore be too narrow but should acknowledge that further developments will be desirable in the future and that a building design should be flexible enough to allow for alterations and expansion in the years to come.

The majority of heads of technology in the schools visited recognise that their centres will need to change in one form or another as their school's understanding of the subject matures. It should be noted that even when purpose designed new buildings have been provided, some schools have subsequently found it necessary to undertake major planning alterations and often only two or three years after their new premises were opened. Furthermore, most of the examples illustrated in our book were designed prior to the publication of the Government's statutory orders. The building designs were often conceived as CDT buildings and as a result do not encompass all aspects of technology as currently advocated. Schools considering new buildings now have the advantage of addressing the subject in its broader context. Nevertheless, it will be essential that new building designs remain flexible enough to allow for change in the future. There is much to be said for providing large clear span

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structures that allow a department to be subdivided into specific areas using non loadbearing partitions so alterations can be carried out economically in the future.

## The Technology Centre

So what is an ideal technology department like and what makes it different from other teaching accommodation in the school?

First and foremost, technology requires pupils to undertake a wide variety of practical activities which demand special facilities beyond the general classroom. Those schools that have, for example, established CDT departments will recognise that a substantial amount of space is required to accommodate workshops and design studios and this will normally form the basis on which to generate a technology centre. Publications such as the DES Building Bulletin 63 "Craft Design & Technology"<sup>1</sup>, will continue to be useful reference material. However, the change of emphasis from CDT to the broader design and technology capabilities will require schools to re-interpret the areas of accommodation required.

Whereas CDT Departments have tended to be planned around the principal workshop and manufacturing area (for example the Harrow technology building), designs for future technology centres will need to place greater emphasis on common multi-purpose areas which might be used as exhibition halls, meeting areas and design studios.

The National Curriculum emphasizes that the teaching of technology, unlike any other subject benefits from close cross-curricular links between subjects and in particular science, art, IT, CDT, home-economics and business studies. There are significant advantages therefore if all related subjects are located adjacent to one another. If schools are to establish a centre of merit considerable thought needs to be given to the re-organization of existing facilities. In practice this can be a major planning problem. Traditionally art and science departments have been separate, both in terms of their physical juxtaposition and their general management. Technology requires that the knowledge and skills gained independently through, for example, art and science are drawn on to ensure that projects are undertaken in sufficient depth and to the standards advocated in the National Curriculum.

More and more schools are resolving their accommodation problems by building new technology centres. Of the examples illustrated in our publication there are one or two centres which are particularly inspiring in terms of their design philosophy. Ampleforth College was one of the first independent schools to build a new technology centre that incorporates art and design facilities within the CDT department. Their octagonal building design reinforces the concept that a variety of disparate activities can be linked together to form a unified and meaningful department. The two storey building is planned with predominantly clean and dry rooms on the upper floors and messy workshop areas on the lower level. Rooms are designed around a common central double height exhibition area which also acts as the main circulation space.

Although there is an absence of certain accommodation such as a technology laboratory or a separate design studio, the concept behind the Ampleforth design is exemplary. Whatever project a particular pupil is working on at any one time, he is very much aware of the variety of other activities going on around him. His inquisitive and competitive nature ensures that he learns as much from other pupils as he does from his own personal experience and the architecture makes this possible. The variety of activities undertaken within the centre gives the department its creative vitality.

The new "Design Centre" at King Edward's School, Birmingham, which opened in September 1989, is a further refinement of the Ampleforth design concept. where art and CDT are integrated. All the facilities are designed around a common entrance foyer/exhibition area, which is the focal point of the building. The area of accommodation is substantial and required a three storey building to be constructed on a relatively small site. Unlike other three storey examples where communication links between the different areas of the building are hindered by floor divisions, the King Edwards design ingeniously incorporates split floor levels so that all areas of the departments are open to view as one enters the

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building. The importance of each activity within the total technology experience is therefore made apparent when working in any one particular area of the building.

Since a junior school technology centre might be less than half the size of a senior school department, the possibility of linking technology with art and science accommodation is much more feasible at junior level, and there are some very good centres where such cross-curricular links have been achieved. The centre at Castle Court for example incorporates science, art and CDT facilities which are planned around a common exhibition/foyer/seminar area. A central multi-purpose space of this nature offers enormous potential when planning inter-related curricular activities along the lines advocated in the National Curriculum. Summer Fields are building a new two storey centre which again incorporates science, art and technology accommodation under one roof. This design reflects the complex inter-relationship of each department within the centre as well as the unusual restrictions of the site chosen for development. Orwell Park have opened a remarkable new multi-disciplinary centre which might be considered more appropriate for a senior school than a prep-school taking pupils from 7-13! The design for Port Regis School included in the book is also conceived on a grand scale and is a good example of how the various disparate activities can be arranged to produce an ideal "Technology Centre".

Some schools have recognised that technology can also benefit from links with subjects other than art and science. St. Pauls School, for example, has planned their new accommodation adjacent to a new theatre and drama workshop. Chafyn Grove School has a new building which links the technology department with a multi-purpose hall used for drama, concerts and exhibitions. There can be significant advantages in establishing links with a variety of different departments in the school. Indeed technology should not be viewed as an isolated subject that can afford to be located away from other activities. Choosing a suitable site is therefore key to the success of any new building venture. It may well be that in order to satisfy siting criteria alone, existing buildings should be converted in preference to new developments on "green field sites".

## **The School Development Plan**

It is recommended that no building programme is undertaken until a school has addressed in broad terms how technology is to be organised within the school curriculum. Ideally a Development Plan should be prepared and agreed at the outset. To proceed with building works without such a plan might easily result in an unsatisfactory building design and possibly an uneconomical use of valuable resources. Many schools are now auditing the school curriculum and resources along the lines set out in the DES publication "Planning for School Development"<sup>2</sup>. Assessing the suitability of existing building accommodation to meet the needs of the National Curriculum is an essential part of this auditing process. Once the strengths and weaknesses of each school have been identified, a comprehensive Development Plan can be drawn up with confidence, and with the backing of all members of staff.

Heath Avery Partnership have been involved in a number of designs for new technology buildings over the last 18 months and we are in no doubt that the most successful and the most cost effective schemes are those that have involved a comprehensive survey of existing buildings, an analysis of all anticipated future building developments in the school, and the preparation of a detailed Development Brief prior to commencing any building design work. This process involves a great deal of ground work at the early stages of a building programme but it enables the Architects to work on a building design with confidence and ensures that the end product meets the school's particular objectives. As all designers know, a product is ultimately only as good as its brief! Spending time preparing a development plan at the outset will save a great deal of time and money in the long run.

An architect's contribution to the production of a school development plan can be quite extensive. He can often be asked to carry out an accommodation audit which involves looking at the large majority of existing school buildings and assessing their suitability for current and future requirements. Part of this process includes discussing with members of staff the broader aspects of school development and usually they fill in a questionnaire. On the whole, most teachers are delighted to have an opportunity to

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air their views, particularly to independent consultants who are not involved in the internal politics of the school.

Detailed "team" discussions can be highly productive by way of pooling information and ideas but they also have the ability of boosting staff moral enormously. Once completed, the development plan gives members of staff a better understanding of what their school is like and how it might change in the future, but above all it enables each member of staff to identify his or her particular role within the corporate plan.

## Summary

To conclude it may be helpful to list the key issues we consider of importance when planning a new technology centre:

- \* Prepare and agree the school Development Plan
- \* Establish what additional technology accommodation is required
- \* Agree how cross-curricular links are to be encouraged
- \* Agree curriculum timetable to establish size of technology centre
- \* Prepare and agree a comprehensive brief for new accommodation
- \* Consider re-organisation/conversion of existing buildings
- \* Consider temporary buildings or phased development options
- \* Consider the need to build in flexibility into the department
- \* Allow for future expansion
- \* Do not underestimate the need for storage \*\*
- \* Appoint professional consultants who have expertise in this field.

## References

- 1 DES Craft Design and Technology London HMSO 1985 (Building bulletin,63)
- 2 DES Planning for School Development London HMSO 1989

\*\* It is important to emphasize that all the schools visited totally underestimated the need for storage space, and this has proved a major problem in the general running of the department. Sufficient space is essential for materials and equipment, work in progress and completed projects.