

The Design Idea

It would be true to say, that the past three years at Orange Hill School, have been the most exciting and rewarding of our teaching careers, realising our most ambitious hopes for design-linked craft studies in the all-ability school; the excitement and reward stemming from a veritable explosion of creative work produced with a general high degree of skill by the pupils in our care.

Design & Technical Studies

Orange Hill Junior & Senior High Schools, Edgware

The department was established at the beginning of the school year 1974/75, when departmental staff were newly housed in a purpose built, open planned block. There are three main practical working areas and an adjacent Drawing/Design Office furnished with drawing stands.

Two main working areas are equipped for light engineering with casting facility, and the other for general woodworking. A focal point of each work area is a large formica topped work table, at most times more than fully used for sketching, card modelling, class discussion, and the formalising of pupil dispersal for specific teaching purposes. These tables were felt to be necessary additions to the normal provision, and their worth has since been more than adequately proved as far as we are concerned.

The facilities described are shared by two schools, the Junior High School (1st, 2nd and 3rd years), and the Senior High School, situated two miles away where pupils complete their schooling – the department is located in the Junior High School site, and Senior High School pupils travel to us by coach. In total, the schools form a mixed, through, all-ability school of approximately 1,200 pupils. All staff in the department are both industrially and college trained.

An early administrative decision of major importance to the future work of the department concerned planning the use of available workspace to maximum advantage. The following decisions were reached.

- 1st year** (Boys only under present school policy)
1 x 2 periods/wk 1 term drawing office
2 terms workshops
- 2nd year** As 1st year
- 3rd year** (Girls as well as boys allowed to opt.)
Formal courses in technical drawing commence, alongside workshop design activities.
1 x 3 periods/wk Workshop
1 x 2 periods/wk Drawing Office
- 4th year** (Senior High School Option).

The department specifies requirements for exam courses – those pupils taking design should also take technical drawing or Art. In certain cases more able pupils are allowed to take design only (on the understanding that they will study additional work in graphics at home and in discussion with us outside normal class time).

In some cases pupils opt for technical drawing only, and it is still possible for the more able of these to study for the Oxford 'A' level design qualification. Indeed, some of our past pupils have successfully done this.

- 1 x 4 periods/wk Design
1 x 4 periods/wk Technical Drawing/
Design Graphics

5th year As 4th year.

6th & Course – 'A' level Design (Oxford) –

7th years minimum 2 hrs 40 mins/wk at present, plus any additional time by arrangement.

Details of courses offered appear below:–

Design and Technical Studies

- Courses Offered** 'A' Level Design (Oxford Board)
'O' Level Design and Communication
CSE Design & Technology
'O' Level Technical Drawing
CSE Technical Drawing

Details for information to parents prior to options at end of 3rd year.

'O' Level Design/CSE Design and Technology

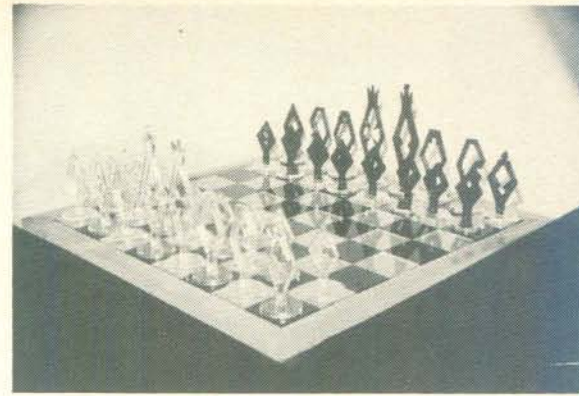
This course is primarily concerned with wide ranging design consideration as well as the graphical and verbal communication of design ideas in both drawing and report forms respectively. Designed artefacts are manufactured in a range of materials including wood, metal, perspex, glass, reinforced plastics, etc. Pupils are required to function as designers, and to acquire the necessary craft skills involved in the working of materials. They are also required to have a sound knowledge of representative drawing, including the use of formal technical drawing techniques. This is a subject where pupils are required to think over a very broad area of topics – they are continually involved in problem-solving situations, analysing, researching and manufacturing. Outstanding pupils basically following the CSE course, would be considered for 'O' Level entry. Pupils not achieving the necessary standards for 'O' level would be entered for CSE examination.

'A' Level Design (Oxford)

The 'O' Level Design and Communication course leads to this 'A' Level in Design.

Pupils following this course would probably be aiming for a professional qualification and career in the design field, in architecture, engineering, etc., or perhaps for a specialist teaching qualification for Craft and Design in schools.

This is a demanding course, where pupils are required to function as designers at quite an advanced level. For example, former pupils have been involved in major projects such as: the design of a mobile operating theatre for motorway accidents, the conversion of a standard production car for invalids use, an old aged people's complex, the design of toys for severely handicapped children (the pupil



concerned here is a girl and she is, in turn, liaising with a school for handicapped children as well as consulting with a professional designer in this field). Main topic areas are:— Man as an Individual, Ergonomics, Anthropometrics, Man in Society, Environment, Production and Economics, The Consumer in an Industrial and Technological Society.

Candidates require a general understanding of materials and their application in the solution of design problems.

'O' Level/CSE Mode I Technical Drawing

This is a disciplined subject, requiring precision, neatness and skills, which relate directly to the design course as essential elements in the communication of ideas.

Pupils taking this course would be interested in further qualifications in design, perhaps in technical apprenticeships, or in furthering their experience of mathematical graphics.

It is strongly advised that, pupils following the Design Course should also follow a course in Technical Drawing. However, if this ideal situation is not possible within the option choices, Art would be the most comparable and acceptable alternative.

In *exceptional* circumstances, it could be possible after consultation with departmental staff, for a pupil to be accepted for the design course without following a technical drawing or Art option.

It was realised from the outset that, as there was no established design work generally in the curriculum, and that pupils up to the fourth year had not had the benefits of a co-ordinated course in the acquisition of basic skills, it would be necessary to establish a completely new approach from the first year. (The reason for this lack of technical background stemmed from the fact that the JHS was originally a Girls' Grammar School with no craft block. The new block had operated on a minimal basis during the year 1973/74).

There were additional problems to be overcome for similar reasons higher up the school, with examination courses in Design commencing at fourth year level; these problems were mainly overcome, and a certain amount of success achieved in the examinations that followed. We will not attempt to discuss these problems in this article as any discussion would have to be lengthy to be fully appreciated. We would, however, be pleased to hear from those who find themselves in a similar situation in introducing design studies.

Philosophy

Design, as the word implies, is concerned with creativity, and this forms the basis of our activities. It is recognised that even the most able children, bursting with enthusiasm and full of original ideas, can not bring these ideas to fruition without a formal training in design procedure, in the means of communicating and clarifying their ideas (not only to others but to themselves), and in the mastery of basic and advanced craft skills.

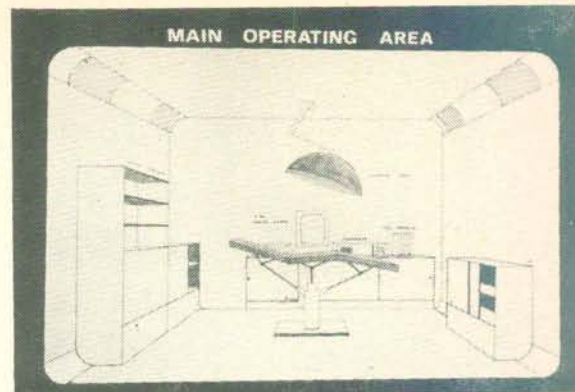
We read with great interest Hilary Cameron's general summary of adverse criticism aimed by various bodies and individuals toward existing design based courses in schools. Her comments on the 'materials circus' as an introductory course to the craft disciplines of the design department leading to 'a fragmented, unrelated experience of materials with a later unco-ordinated jump into more academic designing situations demanding considerable skill and understanding'. 'Similarly the rigid use of the problem solving process as a "method" for creative work which many pupils would find difficulty in using, the misconceived use of themes to link work in different areas of the department'. These approaches are alien to our work at Orange Hill.

For example, while we accept children should be made aware of their environment, that they should explore numerous possibilities within a particular problem situation, make decisions for themselves, &c., together with all the other well worn cliches associated with the teaching of design studies in schools, the fact is that they have to be *taught* design procedure, together with all the skills that apply to it. Take the statement that 'pupils should have an awareness of their environment, materials and processes' — Of course pupils should have an awareness of these things, but it is extremely doubtful that this would develop solely from exploration by the pupil, without the knowledge to make an accurate interpretation of findings. A pupil will not be aware if he is unable to recognise what he is meant to be aware of! Neither will his awareness be apparent if he is not able to communicate it — to recognise and communicate, pupils must have the essential basic skills and procedures. Pupils need more than 'a few details' if they are to function at a high level. It is clear that pupils in a design situation will not achieve success on scanty or ill-presented information, neither will these same pupils develop any real sense of awareness, nor any real degree of skill.

A comment we once heard that 'the whole process of design teaching should be exploratory' is a pipe dream as far as first and second year pupils are concerned, as they have many basic skills to learn that they will need to 'explore' later in school life. The nett result of giving first year pupils the freedom to explore without basic skills would be, in a word, chaos! One has only to look at general results stemming from the 'circus method' of design education mentioned by Cameron, where children circulate from department to department — exploring!

Children appear to gain very little from this system of teaching, understandably, as they are being presented with too much information in too little time and because, of course, they are not able to acquire the necessary range of skills essential for future development.

A major philosophical point which has been apparent in our work to date is that we have attempted to produce a controlled environment and



an approach to design which helps to instil in pupils a sense of pride in craftsmanship and in all that they produce (whether it be the production of graphics, folios or practical work) and to create an awareness of the ever widening boundaries which need to be investigated to produce a physically and emotionally satisfactory article.

An analogous situation of design in schools can be likened to a tree in a meadow, a strong sturdy trunk with many healthy, far reaching branches seeking as much light and goodness as possible. It will remain healthy for many years if it gets plenty of rain and light, and will go on to produce the richest and strongest wood that is possible. This is surely the reward of careful cultivation. Our tree of life for design is so close to this analogous statement that not to harken to its message is to court the chance of warped and twisted products!

Motivation has never been a problem in the craft world; we know that it is all too easy to introduce children into a workshop situation and away they go, they cannot wait to get their hands on all the tools and materials. But how do we introduce the controlled element, slow them down and still motivate them!

How do we tap this area of inherent attitudes and innate senses? We know that we can sometimes see an instinctive approach to a set problem which might or might not have been triggered off by the teacher, but what of the cognitive and organisational background which we can foster which leads to a greater perception of the problem and allows much of the contents of this potential powder keg to be tapped in a controlled and yet dramatic way. This potential energy which we have at our disposal can cause the most amazing things to happen. It can lead to a spark leaping the most incredible gaps and leave us staggering in wonder at the abilities of the children in our care.

In terms of establishing and continuing motivation and interest, one sure way of capturing the attention of a whole class (as every good teacher knows), is to ask questions of individuals. A certain way of keeping that attention and interest is to get pupils asking questions of themselves – to think like designers and to communicate their thoughts and ideas.

Important Factors Affecting the Learning Situation

1. The development of a keen visual and tactile perception from the outset.
2. Instilling in the pupil the importance of a detailed and accurate approach to the work, and an appreciation of professional standards in terms of everything that they do.
3. Talking with pupils rather than *at* them, and being prepared to discuss at length, individual problems (not necessarily in normal class time).
4. Controlled project situations in years 1, 2 and 3 – with established boundaries and specific aims in terms of the acquisition of skills, techniques and problem solving. Subtly led decision making in early years. Consideration of the depth and

scope of a particular project in relation to the time taken in completing it, and the project's value in terms of the general acquisition of basic skills, both graphic and manipulative.

5. A disciplined working situation, achieved initially by absolute insistence and, subsequently, by the pupils' acceptance of the required standards of behaviour and effort through recognition of their own potential achievement within that situation.
6. Conveying to pupils an understanding of graphic representation in two and three dimensions from the first year, together with the importance of the measured drawing.
7. Pupils have a clear visual impression of what it is they are to be involved in making – by use of sketching, formal drawing and the use of colour for visual impact.
8. Pupils must be *taught* design procedure, to investigate and research, to think of more than one way of solving a particular problem, and of representing things graphically in communicating ideas.
9. Original and logical thought is encouraged, and pupils are taught to communicate their ideas verbally by discussion, in written form, and by the use of pictorial and diagrammatic sketches linked to formal orthographic drawing.

One has felt, over the past year, that to give a child the chance to experience an incredibly wide field in relation to materials and skills, is surely to widen his/her visual and tactile knowledge and for them to reap the benefit later on. What has not been apparent has been the limiting quality of the majority of children's receptive organs. In terms of information received by the senses, it seems that Kimbell's examples of perceptual response (Spring 1977) do not take into account individual differences in perceptive mechanisms and responses. He speaks of 'we' as if we all absorb and record information to the same degree. 'If we are about to cross a busy road, we do not take in the colour of the nearby roofs, or the noise of a passing train, or the smell of a fish and chip shop – all our senses are concentrated on the road, the cars, the speed of cars, the noise they make, the traffic lights etc'.

This is probably generally speaking quite true in considering the average individual's perception and response. However, it is equally true that some individuals would note most of the conditions applying prior to crossing the road (including the train and the chips!), while others might smell only the chips and be run over! These analogies of course relate to the children we teach as they learn to distinguish between that which is relevant, and that which is irrelevant.

They must therefore *learn* to choose discerningly after assessing the factors that apply in making a decision. Give a person an ill assorted set of problems or items and he/she does not know where to begin, let alone determine solutions. Children like to be organised; they need to know when, where and what they are going to do next. To be ill-prepared in

providing them with their 'flight plan' is courting disaster. In a design situation, we are unable to depend only on the knowledge that we ourselves have gathered by experience. We are continually being treated to new experiences by our pupils! For example, an improved approach to our original one on the design of a nutcracker handle by a second year boy consisted of a folio listing one hundred and eleven different types of nuts from all over the world, including their places of origin, their botanical names and their commercial uses!; sculptured handles produced from progressive design study sheets, which the late Barbara Hepworth would have admired; a colour slide of a girl's chess-set which reminds one strongly of Henry Moore's King & Queen; a candle-holder embodying a spirit of rhythm in its stand. Machine textured surfaces produced by second year boys of below average ability that had final year engineering students from industry criticising the apparent lack of indexing in the spacing of machined surfaces! Finely engineered plastic laminate cutters produced in the fifth year and evolved from first principles, following the design process in close detail and ending up as an aesthetically pleasing and functionally efficient tool, which any engineering exhibition would be proud to have as a centre piece.

We have folios being produced in the first year by boys who realise that the standards set are extremely high. They can look around our complex and see evidence of previous children's work, photographs of competition winners, exhibition entries of early design, drawings and presentation sheets of projects. All is in colour and splashed at apparently random intervals around the workshop and drawing areas. We have plants in odd corners which tend to lessen the 'oil and spanner' atmosphere of the workshop and make it into an environment in its own right, which people want to come into and be part of. Because they can see so much, and because we continually ask for 'professional' standards, it is quite amazing how they respond. Even their first attempt at a folio on the design of a keyrack is quite often typed! (Very often by themselves as well; we don't ask what Mother has said when she finds out the keys are crossed on her typewriter!)

As the pupils progress through the years we have found that the standard of presentation becomes better and better, we see a 'snow-balling' effect whereby each student is thriving on competition and being drawn on and passed from behind to stay out in front. There is 'no' substitute for healthy competition. Life is a competition and if you have a healthy experience bred on success, then you must be a front runner. Even the less able thrive on this success formula.

Because of the controlled approach to design that we advocate, and the fostering of the highest standards of craftsmanship and presentation, it is possible for a student to apply his/her skills to a variety of seemingly unconnected disciplines. It is not necessary for a person to experience as wide a circle of techniques and skills as is humanly possible.



We have proved that coming to terms with one area in great depth allows the pupil to accept and adapt to a new situation with the minimum of frustration. We are of course talking about children and their very flexible abilities at this tender age and not for one moment trying to teach an old dog new tricks.

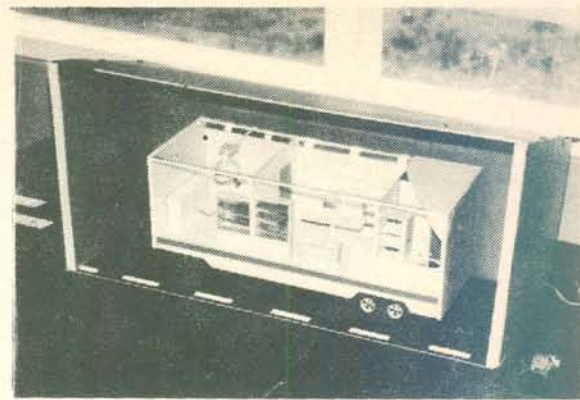
The 'Traditionalist' and 'change'

We all know that as we become older our neural systems slow down, our ability to accommodate change lessens and it is our experience which carries us through. This is 'unfortunately for us' a proven fact. This then means that it is extremely difficult to expect older teachers to change their whole approach to an apparently new idea, design.

As is clear from the foregoing comments, radical changes on the part of the 'traditionalist' teacher are not required. All that is required on the part of any teacher considering a change of emphasis to design in crafts, is that he or she approaches a problem in the same way as industry would. If we are re-organising the bathroom or kitchen at home, we would not expect to be able to buy a system which would fill all situations. We would realise that it is first necessary to assess the problem identifying the needs, to investigate the possibilities that would satisfy those needs, and to research the various systems available related to cost and size, etc. We would need to consider colour schemes and lighting, movements and distances related to the working and storage procedures etc. We would attempt to plan the ideal layout, possibly using a scale plan with colours and cut-outs of the various items of equipment to be fitted within the available area in the most efficient and convenient way.

Presenting the 'design idea' at school is then not so far removed from our own approach to problems of organisation and selection at home. This then leads on to the suggestion that we must teach pupils how to express themselves without actually restricting their youthful exploratory enthusiasms. We can get them to follow the progressive design technique which involves thinking with the scissors, or using soft iron wire and so thinking with their hands. This, then, is one way of overcoming the lack of drawing ability of many children, one thing we must not forget though is to record our results. All is lost if this is not done. Too often we have seen a child with a quite startling idea come to us the next week or even the next minute and say 'Please, Sir, I've forgotten what I just said'.

Cut card can be stuck in well organised rows and soft iron wire can be drawn round and used again and again to find new shapes. We must restrict them at first, it is no good allowing random experimentation because, as we have said earlier, this leads to chaos. Controlled cutting and bending with careful recording of findings by either sticky card or pencilled shapes allows a pupil to see a progressive pattern emerge. When allowing more subtle cuts and bends to take place they see the production of an overall picture which tends to lead them in a particular direction. Each will be different



as some are bold and others unadventurous. Each approach has its place and as personalities emerge they come to learn that they can draw and become personally and individually involved in their own approach to their design project. In this way their personal involvement is such that they believe each of their pieces of work to be unique, and so it is, a variation on a theme.

But, what of the teacher's lack of ability in drawing or sketching. We personally feel that this is an area which must be practised; it can be approached from the engineering bias so that orthographic methods can be used but by far the best approach is to attempt a three dimensional view — this may be isometric as this is the medium engineers use — or it may be perspective as this is the approach artists and architects use.

Obviously children too have these difficulties and we have found that isometric freehand cube drawing can easily be taught in a controlled fashion, the aim being to apply a number of easily understood basic procedures in constructing 3D objects. We aim here for a general success factor, based on the application of the same rules and principles by all the pupils, this results in nineteen out of twenty pupils being able to represent objects pictorially to a more or less uniform standard. This is as opposed to 'free expression' of perhaps doubtful natural talent, that no-one, including the aspiring 'drawer' is able to understand!

While free expression may indicate the child's visual impressions, it is not so much how *they* see things but how they *need* to see things if they are to reach a making stage. Industry would hardly adopt this system as a standard means of seeing things if it were not the best means that could be found of avoiding visual errors.

Very few intending teachers of design seem to recognise the importance of the application of formal drawing to the design procedure. It is all very well to suggest freedom and licence to draw as they 'the pupils' see things; but the fact is that if artefacts are to be made to a high standard, then it is essential to standardise and formalise the drawing process prior to manufacture. One does not expect an English or Mathematics tutor, or French or Music mistress to hope for a perfect sonnet, or a perfect integration, or a perfect translation, or a piece of chamber music to be written unless the student has first learned the fundamentals.

Drawing then is an essential basic link in the communication chain and therefore needs to be thoroughly introduced. So we follow a course of action, a planned campaign, which will allow a child's progressive development in the acquisition of skills and in terms of a sense of awareness of history, ecology and the environment, etc., and in realising the importance of the designer/craftsman within this framework. Also encouraged, is the interchange of views during formal and informal discussion.

Any planned campaign is initially related to the particular training and experience of the teacher concerned, allowing greater control of the work.

Pupils developing a relatively high degree of skill in a particular craft, would find it easier to acquire skills in other crafts. For example, pupils taught the correct methods of sawing and filing plastics and metal, would in turn apply the same appreciation of standards to work in other materials. Pupils following our courses are often required to make accurate two-dimensional card models, which require careful measuring, marking-out and cutting, *before* commencing work in metal, wood, or plastics, etc.

One can look around and see that many of the ways of the past have been superseded and that new technologies have become available to the teacher and that, in consequence, we have had to adapt our teaching methods.

As in the drawing approach, so in the craft skills approach. Because of the nature of this basic structure it becomes evident that various areas of controlled skills are gradually established and one can see that there are high standards of execution because of this natural progression. Kimbell states, 'Any discussion of the skills that should be taught in a design course is ultimately a discussion of aims', and this he relates to a school's aims in general. At Orange Hill we are concerned with the education of pupils in such a way that any aims sought find their own set of skills. In other words, the acquisition of skills is a natural progression and an integrated part of design as seen at school level. One should not bias the aims to fit the skills, the skills will come because of the organised and structured nature of the course. There is no doubt that, because the design-tree is such a complex structure, many pupils have to learn a great variety of different skills in order to realise their projects.

This is not to say that we should have abandoned all that went before, because teaching is based on some prime factors whereby quite often it can be successful.

So the 'old guard' can quite often show the 'new Brigade' the way home at the end of the day in terms of structured teaching.

Alongside these skills and techniques must range the methods of recording evidence. Evidence which has been gathered by investigation and research, by questioning teachers, parents and friends, and evidence gathered by reading journals, papers and in answers to letters written in search of information. All this must necessarily take place in a pupil's own time, but must be considered part of the design course work. The recording of this information must be as systematic as possible for each child's ability level, and should be presented as a complete folio or report alongside the final design project work. Any theoretical information which a teacher sees as necessary to complement the project or which is necessary as supporting technical work, should be introduced and amplified in formal general discussion and then put firmly in the court of the pupils for them to produce their technical reports. Only by insisting on this method of presenting information can we fully cover the incredibly wide background knowledge required in

support of design studies. We have never ceased to be amazed at the response this type of approach receives. Parents and pupils alike, combine to help in producing work that is quite unique, and one finds that the sense of fulfilling a 'mission', gives considerable added pleasure and interest to the work. (This is of course sadly not true in a minority of cases).

We have emphasised the progressive technique of reaching a solution and, similarly, would like to emphasise the progressive method of reaching the sixth form by escalation of the standards of requirement in respect of personal decision making. By this controlled expansion in the area of decision making, a pupil arrives in the sixth form with an incredible awareness of the implications of design compared with his contemporaries of a decade ago. Students are now ready to discuss in depth social and environmental problems in a mature and meaningful way. Responses like 'I need to investigate the area of awareness in a blind child which might enable it to visualise the complete shape of a particular tree through some tactile medium' or 'I must be in the design area on the first day of term to record impressions of first year boys in terms of their motivation, so that I can study the subject of early psychological implications in respect of young pupils of design' clearly indicate that design in schools is here to stay!