

A Level Design at Longslade School

Longslade School, a Leicestershire plan Upper School, was one of the pilot schools involved in the development of the Oxford A83 Design syllabus. Having been familiar with the course since its inception, and being directly involved in teaching the syllabus for the past three years, I should like to express some ideas involving the teaching aspects of this course. I hope that these will not only be of interest to the reader but that they will also be useful, both from the practical teaching point of view, (I use practical here in the sense of the practice of teaching and not 'practical' subjects), and from the point of deciding how valid the course might be.

In fairness, I must point out that my own attitude is very much in favour of this examination. In its present format I believe it to be an excellent syllabus and, with a few minor aspects which are discussed later, one which would be difficult to improve upon.

The organisation of such a course can cause problems, and staffing will depend on the numbers involved. At Longslade the average number of students in each year appears to have settled down to 6 or 7 and, therefore, first and second year sixth are taught together to make a viable teaching unit. However, since there are times when it is necessary to teach each group separately, a second member of staff is available for part of the time to allow the groups to be split. This second member of staff covers the ceramic element of the course, both practical and theoretical. For my part I cover the practical elements of wood, metal and plastics, and the theory elements of wood, plastics, and general design philosophy.

The six forty-five minute lessons each week are shared in the following manner (See diagram below).

This system gives 2 lessons which may be used for separate groups or for team teaching if required. Where advice is required beyond the knowledge of the staff directly involved in the course then students will seek help from other members of staff. This obviously relies heavily on good will within the department and fortunately this is the case at Longslade. It could not be argued that this is an ideal system by any means. Although there is positive inter-action between the two year-groups it would be an advantage to have more time available for separate teaching. Larger groups would also involve more staff and a wider team approach would therefore be possible. Most important of all, however, is that an even greater time allocation would be a great help. The biggest problem is that of covering sufficient of the syllabus, both theory and practical work, in the time available.

Anxieties have been expressed that the examination places too much emphasis on theory and that many students do not have an adequate design portfolio upon completion of the syllabus.

On the first count the mark allocation disproves this argument with a 60% bias towards practical work. This course is very much a practical course on a deeply involved level. On the second count one can only say that if this is true in some cases, then it is the teaching methods which need revision, and not the examination syllabus.

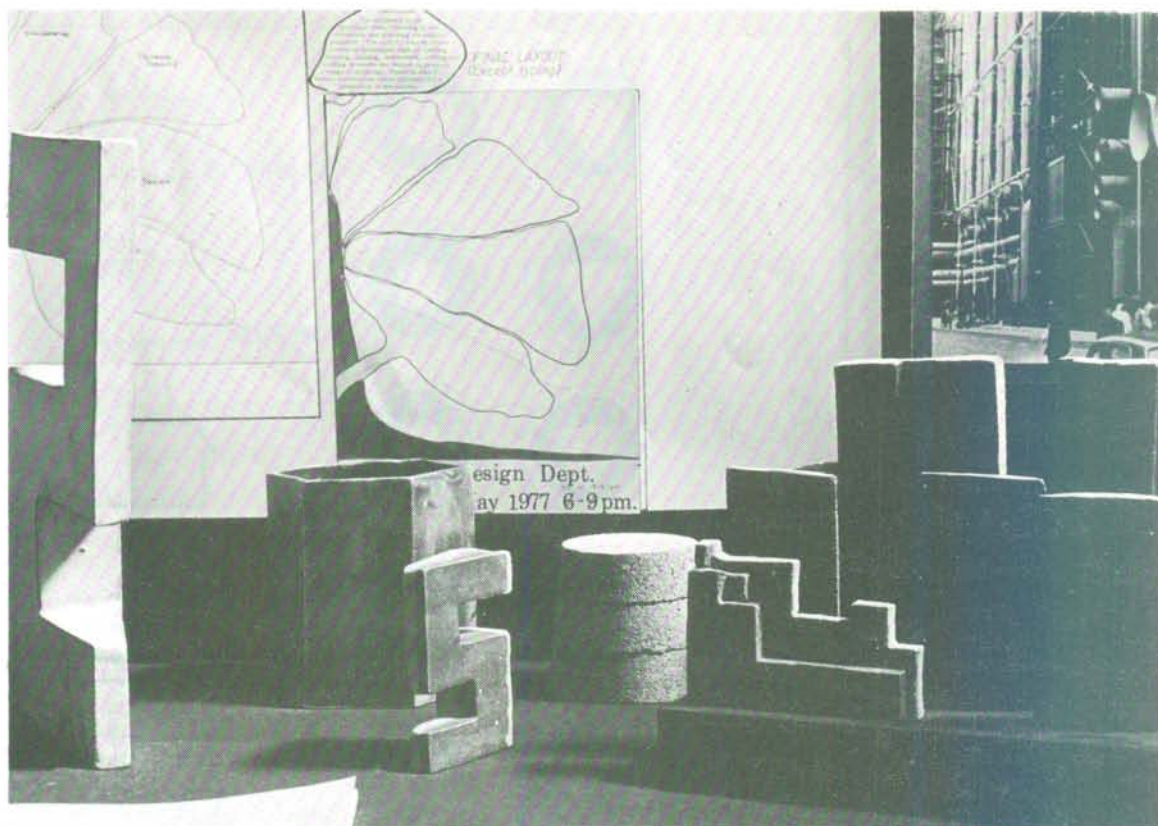
It is in the theory part of the course, however, that my own criticisms rest. It is difficult to relate much of the theory syllabus to the practical work involved in the course, and this is most marked in the technology questions. There does seem to be an element of theory for the sake of theory, though I accept that this is inevitable in an A level course. However, certain questions do seem to require very precise specialist knowledge on topics which must be limited to a very small number of candidates. How many pupils, for example, have sufficient information to answer a question on concert hall acoustics¹ at the depth required for a good A level paper?

The wood technology section demonstrates two points where I have most cause for concern. It would appear that in their desire to make woodwork more acceptable academically there has been a tendency, upon the part of the examiners, to phrase some questions in more abstract terms.² I would argue that a good question should give the student a clear opportunity to put forward his knowledge, and ideas, without having to spend a lot of time trying to decipher what exactly the examiner is asking for.

Secondly, there are some questions which seem to be over specialised for an examination of this type and level.³ Such questions seem more appropriate to a student specialising in this topic in higher education than they do in a syllabus where such a breadth of knowledge is required. It is also very difficult, if not impossible, to teach towards such questions with the resources available in most schools.

N/A = Not available.

Period	1	2	3	4	5	6
Teacher 1	1st yr. 6th	2nd yr. 6th	Both groups	Both groups	N/A	Both groups
Teacher 2 (Ceramics)	2nd yr. 6th	1st yr. 6th	N/A	N/A	Both groups	N/A



I accept that the setting of theory papers must be a very real headache for the examiners and that suitable questions are difficult to find. However, I feel that there could be a more realistic approach in some areas of the paper particularly relating to the examples given.

I do not wish to give the impression that the whole theory paper is in need of revision because this is not so. In fact the majority of questions are quite acceptable and cover the basic requirements of such a theory course.

The practical course is undoubtedly the most satisfactory part of this syllabus for several reasons.

- i) In both the basic course and in the major project there is plenty of freedom for the school to interpret the requirements of the syllabus for the benefit of the individual and the school. Without such flexibility, a design syllabus would find it difficult to survive the major problems of diverse staffing skills and variable facilities available.
- ii) The percentage allocation of 60% in favour of the practical element of coursework is recognition of the intellectual qualities involved in advanced project-work of this type.
- iii) The teacher assessment forms⁴ are a valuable system to involve staff positively in the markings of this work. They provide a more accurate means of assessing the student's genuine contribution to the project than would reliance purely on the end product and any visual supportive work.

If teacher involvement at this stage is to be really meaningful, however, there ought to be feedback from the examiners on this topic. It is not possible to tell from the final grade by how much the examiners have altered the teacher assessment of each project. Teachers do need to know how realistic their marking is if only to arrive at acceptable criteria and standards for assessing future work. It would also give valuable insight into which areas of the design process the examiners felt were lacking in each project. Such feedback could only result in a steady improvement of the quality of work submitted.

The basic course of design practical work serves two purposes.

- a) It serves as an opportunity to give students experience in several materials, techniques, design philosophy and methods of presentation of ideas.
- b) It is an opportunity to develop in students the methods of approach necessary to undertake a major design project.

At Longslade we have developed a series of aims which we hope to cover each year involving various aspects of the design process. Although the design briefs vary from year to year a typical series of aims, with accompanying topics, might be as follows:-

1. A group project.

The students work as a team, deciding how to divide up the project into components and who will look into each section. Final analysis of each contribution involves team discussion leading to a final suggested solution. The end product may involve models or an actual produced article. Each student is expected to present a total design portfolio on this topic, adding his own contribution to the work of other team members, as well as his own major unit of research, e.g. A seat to enable disabled persons, without the use of their legs, to learn to sail.

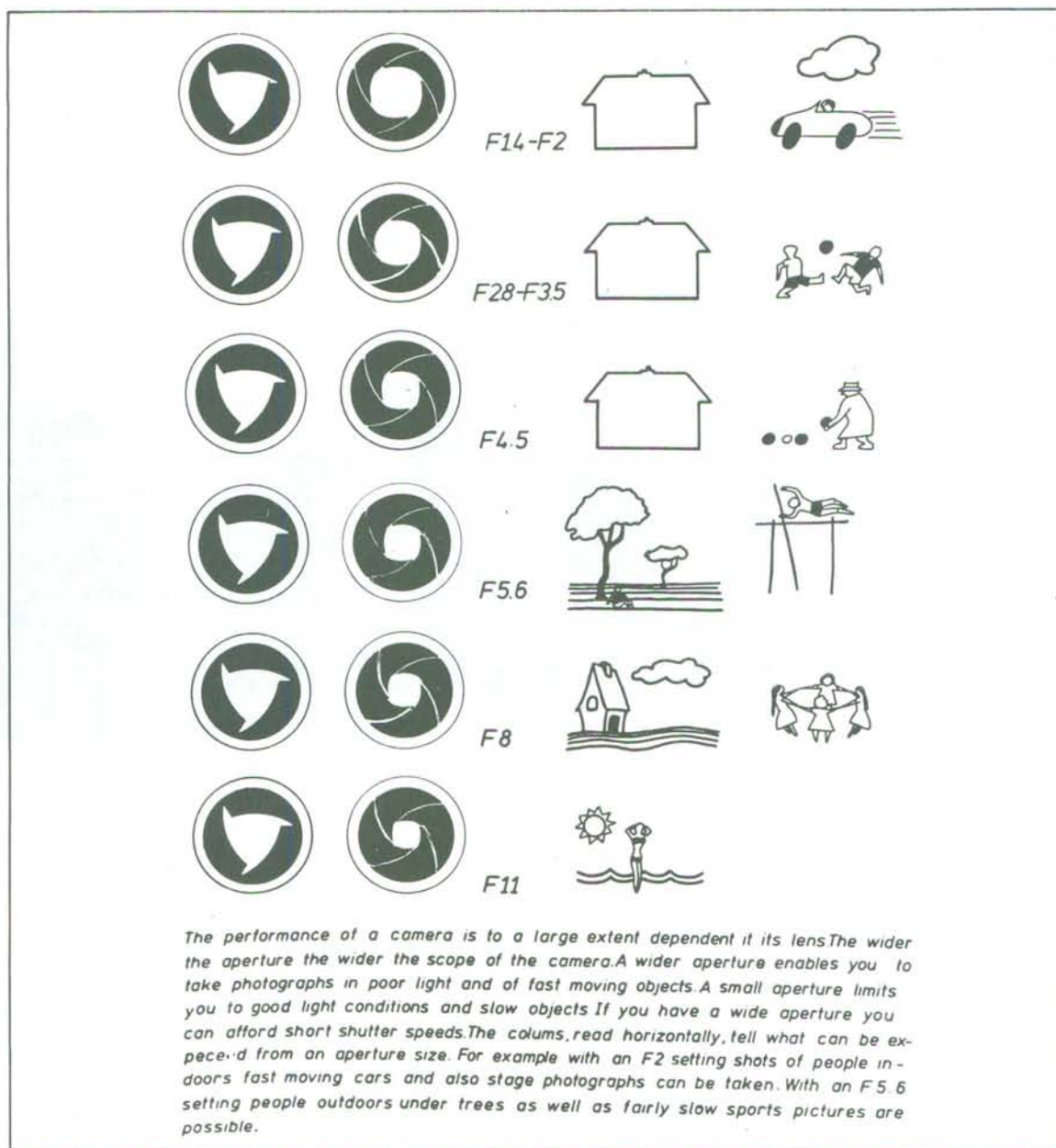
2. A technique based project.

In this case students are shown a specific technique of construction, e.g. Laminating of timber. The project involves certain physical tests to determine the properties of this material. Students are expected to discuss the validity of such tests and their accuracy. Methods of presenting experimental information are discussed together with alternative forms of experiment.

The technique is then developed by each individual into a project which must utilise the major properties of this technique. This project usually demonstrates those problems associated with narrow, pre-conceived 'solutions' which produce unnecessary restrictions on the designer.

3. Development of natural form into some item, e.g. Jewellery

The aim is to show both an original source for ideas, and the way that much designing relies upon a subtle inter-development of the understanding of materials,



skills, physical requirements, and aesthetic considerations.

4. Open ended project into some abstract form or practical application.

A topic to test the imagination and initiative of the student where the form of development is left to the individual.

e.g. The hand ... developmental drawings leading to ...?

5. Material study.

The development of work in one particular material to whatever level each individual is capable of.

e.g. Ceramics.

6. Photography.

A means of visual expression and a recording medium.

Photography demonstrates how visual quality can depend largely upon the knowledge and experience of the process involved. Some projects are purely visual.

e.g. Patterns in the environment.

Other projects may allow the student to express an individual point of view.

e.g. Shop front design, office block development, etc.

7. Environmental project.

The production of an illustrated portfolio on some topic of environmental importance.

e.g. The effect of concrete on the environment.

Aspects of town planning and transport policy.

8. Consumer product.

An analysis of a consumer product. Research into aims, material suitability, production methods involved, etc. Leading to criticism, an awareness of the compromises involved, and suggested improvement.

9. A small scale individual project.

Based on the definition of a clear need. Aimed at giving more individual design experience before undertaking a major project.

e.g. Camera rifle grip.

Adjustable sailing tiller.

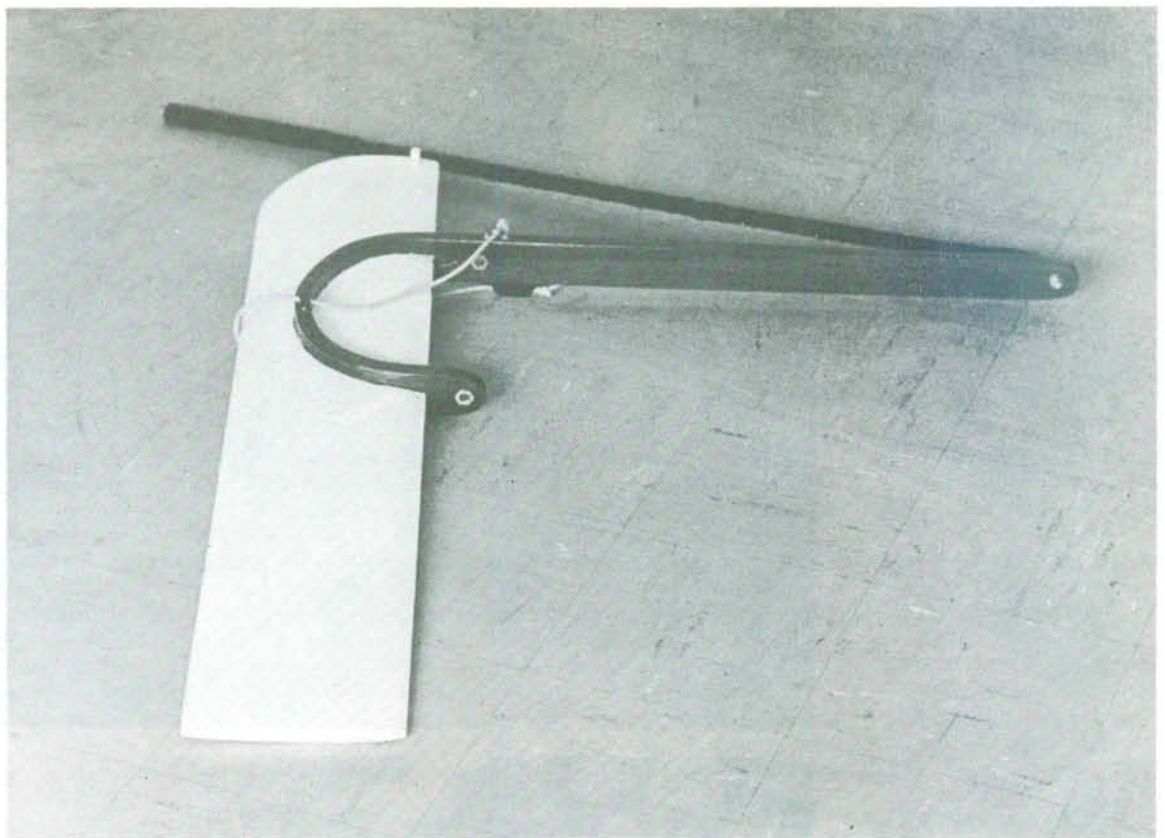
The dissertation undertaken at the conclusion of the basic course, is a valuable piece of work, because it gives a positive reason for consolidating the understanding of the design process developed over this first year.

It is an opportunity to bring together all the individual aspects of each project into a coherent philosophy of design.

Major Project

Perhaps the most difficult part of a Major Project is deciding what to do in the first place. Obviously the basic course has an important part to play in this. Besides introducing new materials and techniques the important aim must surely be to develop those concepts required by the student when undertaking a major project.

From the teaching point of view the following



points are helpful when guiding students to make a suitable choice.

- a) A project in an area in which a student has an existing interest or is likely to become interested and involved is more likely to reach a successful conclusion.
- b) Students should be aware of the limitations of workshop techniques available. They should be encouraged, however, to take an optimistic view of their own skills and potential ability. A project which seems obvious and well within their ability will not necessarily produce a good result.
- c) A list of previous major projects, provided by the examining board, can help the student to visualise the level of complexity of an average project.
- d) The student should be able to define a real need for the specific project chosen.
- e) A discussion of the official mark sheets with the students can help them to analyse their own project ideas to see if they are likely to fulfil all the requirements.

Having decided upon a suitable subject the first step is to map out a plan of action for the work. What can be called an 'Index' to the project.

- e.g. INDEX ...
- i. Why the project was chosen
 - ii. What the real need was
 - iii. Areas of information
 - iv. Experimental work
 - v. Basic problems that had to be solved
 - vi. Stages of construction
 - vii. Basic evaluation
 - viii. Cost
 - ix. Changes made at late stage
 - x. Finishing processes
 - xi. Final evaluation.

Obviously, defining the 'real need' and showing the context of the design project is very important. It is essential that the student clearly explains this subject matter on the report.

What role is the end product intended to satisfy, and what external influences are there likely to be involved?

It is naive to expect students of this age range to be unaffected by their cultural environment and inevitably previous experience will influence

their ideas. There is nothing wrong with gaining information from existing sources, and attempting to start every project from first principals, would seem to be a waste of time in many cases.

One task therefore, is to produce a file of information obtained and this can take the following form ...

- Manufacturer's circulars
- Magazine articles, advertisements, etc.
- Newspaper cuttings which are related in any way — not necessarily constructional — but may cover safety, social, environmental aspects of the design, etc.
- Material samples
- Any connected BSI specifications
- Legal requirements.

What should be avoided is the simple collection and possible mounted display of glossy pictures showing manufactured examples of the article being produced.

These will only be of value if the student can demonstrate their true influence on the design in hand.

Therefore, specific styles of the article can be demonstrated by the student, *provided* that they are analysed for advantages and disadvantages, and particular points asked as having potential for development within the design project.

Since the report should be a full record of the student's work it is useful to include reference to outside contacts made by the student. This may involve written contact with manufacturers and suppliers or even photographic or note evidence of visits to places of information.

e.g. factories, exhibitions, showrooms, etc. ...

It is also essential, at an early stage, to produce an estimate of the final cost of the article to test its feasibility. After all the student will normally be expected to pay unless it is a commissioned project of some kind. This is an excellent way of getting research undertaken into comparative material costs and also forces the student to make a thorough breakdown of the various elements of the project.

Similarly details of actual costs and purchases should be presented as part of the report.



Experimental work poses problems in that it needs to be carried out and detailed evidence presented to the examiner. However, the storage of large jigs in school workshops, already lacking adequate storage facilities, is a problem, as is the commitment to the same end of large quantities of valuable materials. These may be a hidden expense in the project if they are not reclaimable, or at least out of use for long periods. It is not always possible to find scrap materials in sufficient quantity for this purpose either. It is possible, however, to make temporary jigs by using materials jointed together in a non-destructive manner. e.g. By using 'G' cramps, etc. These may not look attractive but they are useful for gaining information concerning such features as size, angles, balance, strength, etc.

In this situation the experiments can be shown to the examiner by such means as photography, diagrams, and tables of results or graphs. Research into alternative techniques can also be shown in this way.

Presentation of final experiments and decisions is very important and should show clearly, to the examiner, how the project has evolved.

Throughout the project, but especially in the early stages, much thinking will be best presented in the form of rough sketches. Therefore a good sketch book full of ideas and comments is an essential part of the course.

In addition, the main elements, especially of the final design, will need presenting in more detail, and working drawings will be necessary.

This may involve scale calculations to cover any moving systems involved.

It may also involve clear working drawings of the end product. Quality of presentation plays an important part, both in influencing the external examiner, and in developing a sense of pride in one's work by the student.

The development of adequate drawing skills during the basic course can have tremendous value at this stage.

*Major Project:
Mobility toy for both
normal and physically
handicapped children.
This is also a
constructive toy.*



1. Mobile toy for both normal and physically handicapped children.
2. New ideas in outdoor furniture.
3. Reclining chair.
4. Re-design of the spinning wheel.
5. Knock down, interchangeable furniture system.
6. Jewellery based on architectural forms.
7. Adjustable boat trailer and road trailer.

*Major Project:
Set of 4 chairs for
the schools 6th form
centre.*



The use of photography can help a project immensely and can undertake the recording of such factors as ...

Experimental work

Visits concerned with the project

Construction techniques

Construction progress

Trial runs in certain projects leading to redesign.

Certainly such photographs, well presented, form the basis for possible discussion during the Vive Voce examination. If all work is well presented, and set out for all to see, the student will be less likely to suffer from those blockages of memory that can occur at such times.

Many students are disappointed by the brevity of the vive voce examination and it does seem unfair that the result of one year's very hard continual work should culminate in a discussion which can be as brief as fifteen minutes.

The end product, though not accounting for too large a proportion of the mark sheet, must inevitably influence the mind of the examiner. Therefore it is important to complete the design and to complete it well. Craftsmanship is still important and any good design is worthy of good manufacture. Since modifications at this stage in many types of project would be impossible or too expensive the student has the opportunity to suggest improvements and alterations in the final evaluation. It is a big advantage to go into the vive voce examination aware of one's faults and ready to discuss them. On the subject of how much help the teacher should give the student the answer is simple. It will depend on the individual skill, intelligence, and initiative of the student and will be reflected in the final teacher's mark sheet.

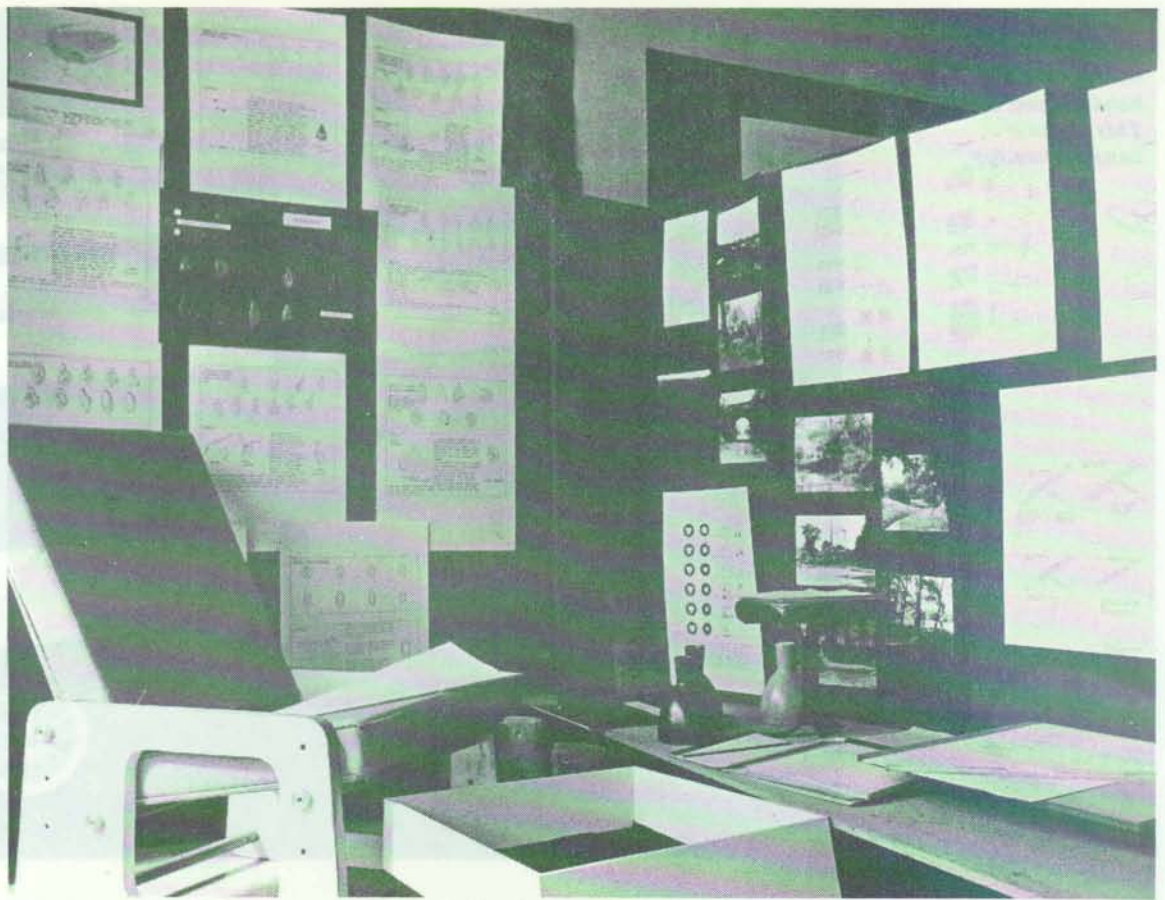
Finally the student should be encouraged to set up a well presented exhibition of his work for the benefit of the external examiner.

In conclusion the requirements of a major project can be set under these main headings ...

1. A clear definition of the problem to be solved.
2. A thorough investigation into all aspects of the problem.
3. A well made end product.

Projects currently being undertaken at Longslade:—

General view of one student's exhibition of work as set out for the external examination.



In all aspects of the design course, however, one must be wary of simply replacing the narrow materials orientated subjects with a course of pure 'problem solving'. This 'problem solving' approach can be equally restricting and can lead to the concept of design being totally involved in product development with an industrial design basis. Although recognising this as an important element of design, and one that reflects the work of most professional designers, it is important that any design course can cater for the more subjective elements of creativity which are less easy to define and evaluate.

Therefore, there must be scope to develop such concepts as intuition, awareness, personal values, a questioning of such restraints as form and function, inventiveness, and originality.

The aim must surely be to develop in students what Professor Cooke⁵ describes as 'Constructive dissatisfaction', whether or not they are continuing to follow design courses in higher education.

The A83 syllabus is a demanding one to teach, but one which brings immense job satisfaction to the teachers involved. It is also capable of stretching the most able of students and places no artificial limits on individual development. The positive influence of such work being visible to other levels of pupils is also an important motivational factor.

As a final point, let me stress that successful application to any such course is aided by previous educational experience. Therefore, the A level design course should not be seen in isolation but as a continuum on a well structured early design education.

Notes from Text

1. The design of a concert hall involves a compromise between functional and aesthetic requirements. List the requirements that the designer of such a building has to fulfil, and indicate where difficulties might arise. 1975 Paper 1.
2. Some wooden artefacts of extreme antiquity exist. How could you ensure that a wooden article made today could have a comparable chance of survival? 1976 Paper 2.
Rather ambiguous. Is the examiner asking for precautions to be taken during manufacture, or is he asking about a suitable environment for the keeping of existing furniture?
3. What are the factors that determine the availability of timber for production purposes at any given time? 1976 Paper 2.
4. Assessment form A and Assessment form B.
5. Professor H.D. Cooke, Assistant Director, Leicester Polytechnic. Speaking at the Design Council Seminar, 28 January, 1978, Leicester Polytechnic.

A 83 DESIGN (Assessment form A)		PROJECT ASSESSMENT		SCHOOL:		CANDIDATE:		TUTOR:	
Project Title:		RATING		2		3		4	
Heading		Tick one box per row		2		3		4	
How well was project chosen (considering resources and needs)?	Saw real need which could be achieved	Sound target based on slight deficiency in re-signing resources or vice versa	Reasonable need based on adequate recognition of resources	Failed to discern need for property, or resources duly recognised	Unsound choice, no recognition of resources etc.				
Comprehension of project as a whole	No significant omissions	Project considered in very wide context	Adequate scope of relevant factors	Few additional factors outside immediate target	Very limited view indeed				
Planning and organisation of work	Tight control on current target	Intelligent changes of target as circumstances changed	Reasonable ability to manage time and effort	Recognised some need for planning	Worked in a very haphazard fashion				
Completeness and presentation of Report	Complete and detailed records well-organised and competently made	All aspects covered although in variable depth, but with reasonable care	Rather patchy - not striking in any respect	Little more than a diary with significant areas omitted	Shoddy, ill-organised shallow description				
How well and apply has the candidate illustrated ideas?	Well-chosen, varied illustration; fair level of skill	Fair level of skill, some reservation on variety of aptness	Adequately chosen and reasonably executed	Leaves something to be desired all round	Little recognition of role of illustration				
Quality of Evaluation	Able to give good and dispassionate criticism	Very fair review with few 'blind spots'	Reasonable or adequate view - sees some reasons for re-design	Only limited ability to review progress and actions	Unable to criticise own actions or designs				
Decision making and consideration of alternatives	Range of possibilities explored; available evidence carefully weighed	Several possibilities considered, with considerable logical deduction	At least one alternative given in reasonable amount of thought	Other possibilities at least recognised	Decisions taken on a random basis only				
Thoroughness in gaining information	Widest possible range of experiments/resources explored	Several types of sources/tests searched or conducted	Adequate experiments; or reasonable coverage of data achieved	Only limited information or trivial tests	No real tests made; no real sources consulted				
How well does report justify project & evaluation?	Covers underlying thinking completely	Very revealing about underlying thinking	Good in some areas	Gives a very limited picture of the context of project	Gives little or no justification				
Quality of manufacture & assembling rig and to demands of project?	Own limitations and demands of design well recognised	Good overall, but with slight deficiencies	Adequate degree of skill achieved	Shows some evidence of skill in limited area	Cannot recognise own limits or demands of project				
Natural flair for, & sensitivity to, design?	A natural, fluent & sensitive designer	Markedly good in this respect	Average in this respect	Shows only limited ability	Unfortunately no real innate design ability				

A 83 DESIGN (Assessment form B)		GENERAL ASSESSMENT OF PRACTICAL WORK				SCHOOL:	CANDIDATE:	TUTOR:
HEADING	1	RATING (tick one box below)			2	3	4	
		Good work, with no real reservation.	Some reservations but quality is still adequate.	There are several good points but aspect could be covered much better.	Work has some merit, but is definitely below average.	Enter the number of the work you feel to be most relevant to each assessment.	LIST OF EXERCISES & OTHER WORK DONE	
A	(i) relevance of practical work						Assign a number to each item from 1 onwards.	
	(ii) quality of argument							
	(iii) recognition of design approach							
B	(i) comparative knowledge of properties							
	(ii) comparative knowledge of processes							
	(i) Range & relevance of criteria							
C	(ii) Recognition of function and user aspects							
	(iii) Ability to compare products of varying type							
	(i) Ability to consider level of development							
D	(ii) Ability to consider several possible answers							
	(iii) Quality of Chosen Design							
	PRELIMINARY DESIGN WORK							
E	Skills - intelligent exploration with regard to candidate's previous experience.	(i)						
		(ii)						
F	Ergonomic Psychological Economic	How far has candidate recognised the various influences and their effects?						