Design Technology — Progress Towards the APU Survey in 1988

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The Assessment of Performance Unit was set up in 1974 to promote the development of methods of assessing and monitoring the achievement of children at school and to identify the incidence of under-achievement.

From the outset it was decided not to take subjects one by one but to look rather at 'lines of development'. There were several advantages in this, not least that we might cover the curriculum with about six surveying projects rather than needing more than double that number. Another advantage was that the assessments would tell how far the procedural strategies which pupils learned in one subject could be used in contexts different from the one in which the learning took place. For example it would be possible to look at a language as a tool for learning whatever the subject. So the surveys look at mathematical and scientific investigatory skills not only in their own subjects but also in other subjects and also in everyday life. The language surveys look at the use of English right across a broad spectrum of linguistic ativity: we are as interested in technical writing as in the writing of stories.

The original lines of development were:

Mathematical
Linguistic
Scientific
Aesthetic
Physical
Personal and Social,

and the focus was upon procedural capabilities as well as substantive knowledge. We wanted to know how well skills and concepts had been learned and also how they interacted in a range of contexts. Surveys were conducted in mathematics in 1978-82, language in 1979-83, and science in 1980-84, but not in the other lines of development. Working group reports were published in Aesthetic development, Physical development, and Personal and Social development.

In March 1982 when the report of the Workng Group on Aesthetic Development[1] was being considered there was increasing interest in the possibility of surveying in technology and this was given priority. While there was agreement that the document on aesthetic development should be published, and the possibility of future work was not ruled out, a decision about surveying in this field was left pending some preliminary development work at the level of individual schools and LEAs. The field is still open for investigation and survey at some future date in fields like 'performance arts' and 'values education'.

As early as 1977 a working group had been set up to consider the assessment of performance in the first foreign language and in 1980 a paper 'Foreign Language' was published. Subsequently a research team was founded and surveys were conducted in 1983, 84 and 85 in modern language at age 13.

Interest in technology and the curriculum was also increasing and it was considered that surveys in design and technology should be considered. A working group submitted a report in 1980 called 'Understanding Design and Technology'.[2] This group had members from schools, higher education LEAs and the HM inspectorate, and included representatives from the exploratory groups on aesthetics, personal and social, physical, and scientific development. This working group report has been discussed widely. The framework for assessment suggested that whilst it was possible to analyse the activity, the dominant feature was the bringing together of the skills, experience, knowledge, understanding and judgements in the execution of a specific task. The document itemised aspects of

(i) designing
(ii) planning, implementation and evaluation

which assessment should cover. It did not neglect the areas of knowledge to be assessed. 'The essence of an understanding of design and technology lies in three groups of technological concepts: control, energy, materials'.

Further evidence was required by the Department of Education and Science that there was enough activity in schools to justify the setting up of one of these expensive survey teams in this field. Professor Geoffrey Harrison of Trent Polytechnic, who had been a member of the working group, won a contract to undertake a feasibility study in 1982. This investigated secondary school teachers' curriculum intentions in design and technology, with particular attention to the principles described in the APU working group report. Teachers of all subjects contributed to the survey. The results showed that different subjects in the secondary school were seeking to have an influence at one or more of the following levels:

(i) to raise awareness of the implications of technology;
(ii) to develop component skills
(iii) to develop technological capability.

Whilst almost all subjects were concerned with implications and awareness, only a small set (home economics, CDT, art, science) were concerned with skill development. Interestingly English claimed rightly that they were much involved in communicative effectiveness, which was vital to this as to other fields. Technological capability involving the concerted development of appropriate ideas and associated design procedures through project work, was claimed largely as the province of CDT and those few departments of technology which exist. On the basis of this research report, tenders were put out for a research team to develop test items with a view to surveying the performance of pupils of all abilities at age 15 in design technology. Goldsmith's College were chosen and in 1985 the research team began their work with a steering group. Vic Kelly and Richard Kimbell direct the team at Goldsmith's and HMI Gordon Warren is the chairman.

The team members are:

Mr R. Kimbell (team leader)
Mr M. Fletcher
Mr J. Patterson
Mr J. Saxton
Ms K. Stables.

Steering group members are:

Mr G. Warren	(Chairman), HMI
Ms K. Brochocka	Digby Stuart College (until 1987)
Prof J. Eggleston	Warwick University
Prof P. Green	Middlesex Polytechnic
Mr P. Hancock	Advisory teacher, Suffolk
Mr J. Hardwick	HMI
Dr A.F. Jeans	Gloucester College of Art & Technology
Mr. A.V. Kelly	Director of team at Goldsmith's and Dean of Faculty of Education
Miss H. Maunder	British Gas
Mrs G. Townsend	Advisory teacher, Essex
Mr G. Wilson	Chief Inspector, Kirklees
Mr I. MacKay	Northern Ireland
Dr. H Wilson until 1987	Department of Education

The first year was more than exciting as ideas were developed about how the integrated wholeness of the design activity in a technological context could be respected whilst at the same time subjecting pupils' performance to analysis in depth. All agreed that atomisation or testing of the parts could never reflect the essence of this activity, which was holistically related to developing optimum solutions to rather complex human needs concerned with making objects and making these objects and systems behave in particular ways.

The outcome of this thinking, which has the support of all the steering group, with their diverse backgrounds from fine art, home economics, industry design, technology and science, is written in the APU publication 'Design and Technology Activity — A Framework for Assessment' (1987).[3]

The work has now become even more interesting as test items are being created and trialled with the cooperating schools. Some of the assssments can only be made of pupils who are undertaking project work of a technological nature as part of their schooling. We intend to try to visit a sample of these pupils, using trained assessors to judge the levels of performance. Many of the tests will be taken by 15 year old pupils who are not at present studying any subjects with a design workshop flavour. They may only have had a basic introduction several years earlier or possibly none at all. Many pupils of high ability may fall into this category. The APU exists to describe the attainments of pupils of all abilities, to say how many pupils are reaching what levels. So the survey includes an all-ability sample with a range of curriculum experience. The reaction of students to our materials so far has been one of enthusiastic participation.

One of the important features of designing in any context is that it is more than a collection of disassociated skills and unrelated facts. Everyone agrees that there are many contributory skills and that technical knowledge about energy, control mechanisms and materials is helpful, but designing in a technological context is more than this. Technological capability is the capacity to put together many competencies and

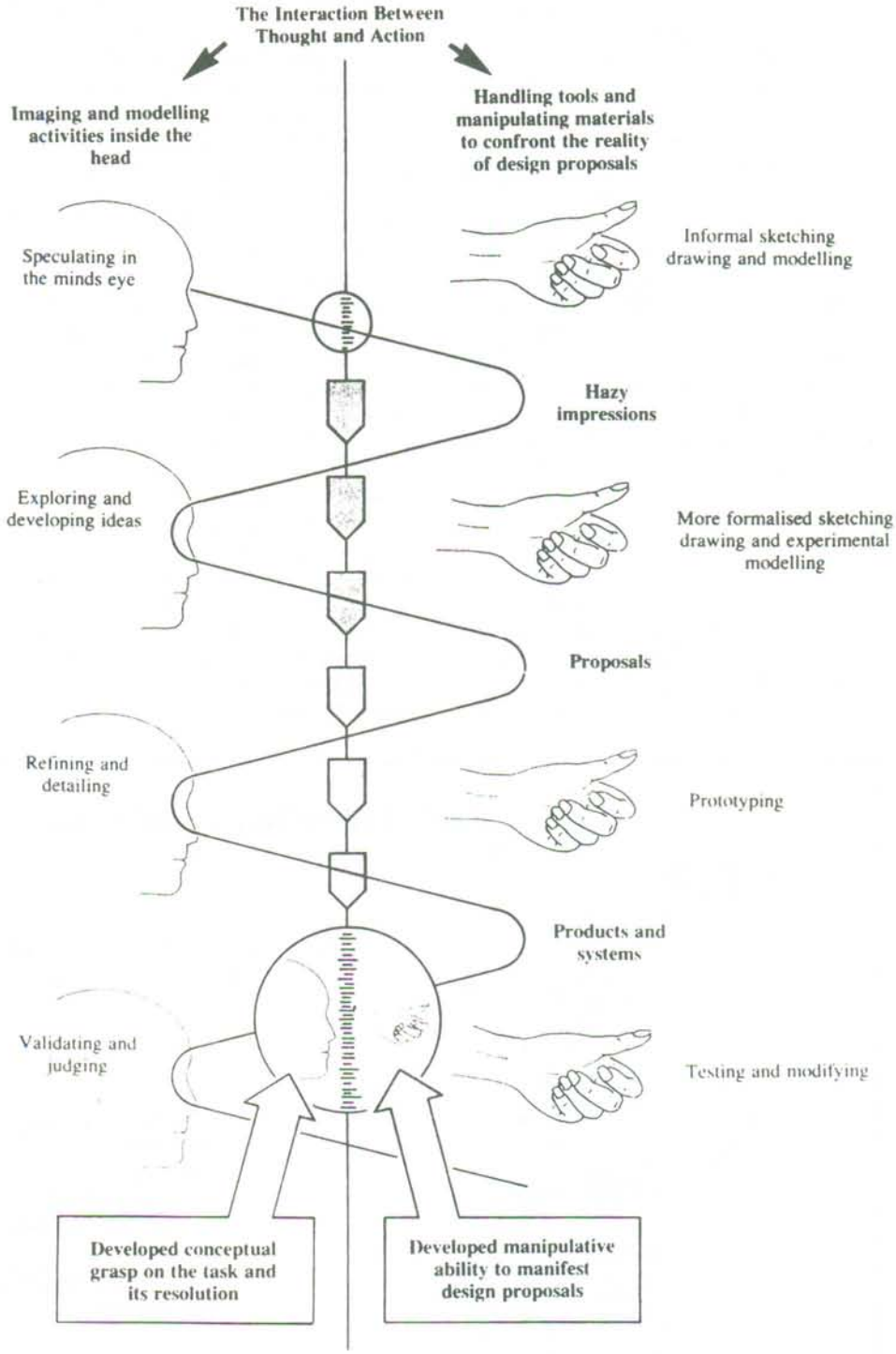

Diagram from the New Assessment of Performance Unit publication *Design and Technological Activity: A Framework for Assessment,* available from HMSO from November 1987.
(Editor's Note: This publication will be reviewed in the next issue of studies in Design Education Craft & Technology).

their attendant knowledge into an appropriate response to the perceived need. There are many stages in this response from defining the task, finding out more information, generating ideas about how to respond and developing the best one, to evaluating that solution to see how far it satisfies the original need. This is a long iterative sequence and thus poses a technological problem for APU. How can you test it in less than 90 minutes? The Goldsmith's research team have used their own design assessment framework to come up with a good solution. Videos are used to set the scene to make the need easy to perceive. Then cleverly constructed fold-over worksheets are used to ask students to respond to part of the design process. The atmosphere created is one of working as part of a team engaged in product development. By using these well designed videos and pupil worksheets the pupil gets a good feel of the whole project and is able to respond. Hopefully the testing of disassociated skills has been avoided. Different worksheets and different pupils respond to different parts of the design process. By aggregating the separate efforts of these pupils who feel they are part of the desired team we hope to build a descriptive picture of how pupils of differing ability repond to the whold design process. Three technological contexts are being explored — people at home, industry and environment.

We look forward to continued progress towards the 1988 survey of 15 year olds. It is interesting to note at this stage that assessing performance in design and technology has demanded the creation of uniquely different test items and assessment strategies from all the other lines of development, but has also led to cooperative work with the science team, the mathematics team and the language team. This illustrates in practice that it is unrealistic to attempt to contain the design technology approach and it inevitably spreads out to use whatever knowledge and skills are most appropriate to find the best solution to the task.

All of us who have been involved in the design of the tasks for the 1988 survey have sharpened our view of what we are assessing and have seen the importance of keeping these aims clearly in mind when we come to evaluate the pupils' responses and decide what is markworthy. Above all however we have found it exhilarating. As in other APU surveys we shall be training practising teachers to make assessments of pupils' work in design technology. After the survey in 1988 and the debriefing of the teacher assessors we will hope to make our expertise widely available to teachers.

References

1. APU: Design and Technological Activity — A Framework for Assessment. (HMSO 1987).
2. APU: Understanding Design and Technology — Working Group Report 1982 (APU, Department of Education and Science, London).
3. APU Aesthetic Development — Working Group Report 1983 (APU, Department of Education and Science, London).