

# Open Learning in the Suffolk TVEI Programme

The Suffolk TVEI project commissioned a curriculum group which was charged with the task of developing an Integrated Technology course. Members included representatives from Education with over 25 years collective experience of Teaching Technology and Industry. The reality of integrating the many facets of Design and Technology soon began to emerge, and an Open Learning system was considered the ideal vehicle to effect this change.

The following factors were felt should be taken into account:—

1. The need to move away from didactic learning approaches, especially in the secondary sector.
2. CDT embraces the philosophy of pupil centred, independent learning.
3. Secondary curriculum organisation based on areas of experience, and the disappearance of subjects as they are traditionally perceived within the next ten years. The development of Technology as a core ninth area of experience.
4. The radical change in attitude and approach required to successfully implement GCSE.
5. The nature of existing staff and their expertise, for example in Design and Technology as opposed to 'Craft' based subjects.
6. The shortage of skilled teachers in Design and Technology and other related areas.
7. The need to support and underpin Technology with sound Design practice.
8. The use of Open Learning material as a form of 'hidden curriculum' In-Service training. Most authorities are not in a position to respond to the massive demand for INSET anticipated in subjects which are changing content radically.
9. The rapidly increasing use of Open Learning systems post sixteen.

## What is Open Learning?

Open Learning can be applied to all curricula areas, and operates on the assumption that any body of knowledge, skills, concepts and values can be presented in a manner which places the responsibility for effective learning firmly in the court of the learner. Open Learning is concerned with ways in which students can negotiate the type of study programme which will best suit their individual needs and circumstances. In order to achieve this, a variety of additional packages have to be available, once the core for each area of experience has been mastered.

It is important to draw the distinction between Open Learning and Distance Learning. Both do offer freedom of access to study according to ability and understanding through structured material, though Distance Learning involves relatively little contact with other students which frustrates the learning experience. It is also often difficult to decide what 'doing well' really means, and difficult to establish reasonable goals and work patterns in relation to the course. However, there is little difference in the starting point of the two; materials being designed to help students learn for themselves.

Open Learning is a recent development. Initiatives like the MSC Open Tech, the DES Pickup, and industry based units (for example Austin Rover) are building on earlier achievements such as The Open University, the National Extension College Flexistudy, and pilot courses within the Council for Educational Technology. Several local secondary school initiatives have developed, for example the Oxford Supported Self Study Project, but none have been discovered which encompass a curricular area in its entirety at a national level.

At the centre of any Open Learning course is the Teaching Package. This is developed by a team which presents a structure for the entire course. This, in turn, is broken down into manageable units (in this case between twenty minutes and a maximum of six weeks) which are organised in such a way as to capitalise on a variety of sensory stimuli and practical learning situations (audio and video cassettes, text, graphics, slides, experiments, self-assessment questions, projects, and more recently, interactive video).

At present, the resources available to those teaching and learning at secondary level are fragmented, a problem further compounded by the variety of syllabi available within any one subject. The introduction of GCSE will go some way to solving the syllabus problem; it also presents an opportunity to reduce fragmentation, and establish a system of learning which is directly transferable from one area of the curriculum to another, based on programmes of study which are self directed.

## The syllabus/learning model for CDT

The areas of 'Design and Technology' cannot be divorced. Although there are many different technological labels (Control, Business, Information, Engineering Technologies etc.) all have the common integrative experience of Design and Production at the core.

The syllabus/learning model outlined will integrate Design and Technology subjects as they currently exist in schools, and will also be applicable to other curricular areas. It is process centred, involving the learner in constant activity, working on Design-Make-Test-Evaluate projects or investigations whilst experiencing the enjoyment of discovering new, relevant information which is readily available. The aim is to provide a situation where the teacher can adopt the true role of the 'manager of learning' throughout a two year course, without the students using her/him as a constant resource. In order to achieve this, the best principles of CDT and Open Learning have been combined.

The course for CDT would seek to satisfy:—

### 1. SKILLS

- a) DESIGN  
Identification of problems, specification, conceptual activity, modelling, research and ordering information, analysis, synthesis, production evaluation.

- b) **MAKING**  
Processing and manipulating materials and components, production planning, assembly, and modelling.
- c) **COMMUNICATION**  
Appropriate use of the graphic, spoken and written methods, including models and information Technology.
- d) **JUDGEMENT**  
Application of a responsible set of values to justify within the context of often conflicting knowledge.

**2. KNOWLEDGE**

- a) **MATERIALS AND COMPONENTS**  
Selection related to characteristics, properties, and performance.
- b) **ENERGY**  
Sources, forms, storage, conversion, transmission, conservation, measurement, efficiencies of use.
- c) **CONTROL**  
Identification of need, static and dynamic systems, concepts, and devices.

**3. VALUES**

- a) **TECHNICAL**  
Efficiency, robustness, flexibility, precision, reliability etc.
- b) **AESTHETIC**  
Proportion, colour, shape, texture, structure etc.
- c) **MORAL**  
Awareness of the impact of technology on society etc.
- d) **ECONOMIC**  
Value, price, cost supply and demand.

Assessment would be criterion-referenced to:—

**DOMAIN 1**  
Design and problem solving

**DOMAIN 2**  
Product realisation

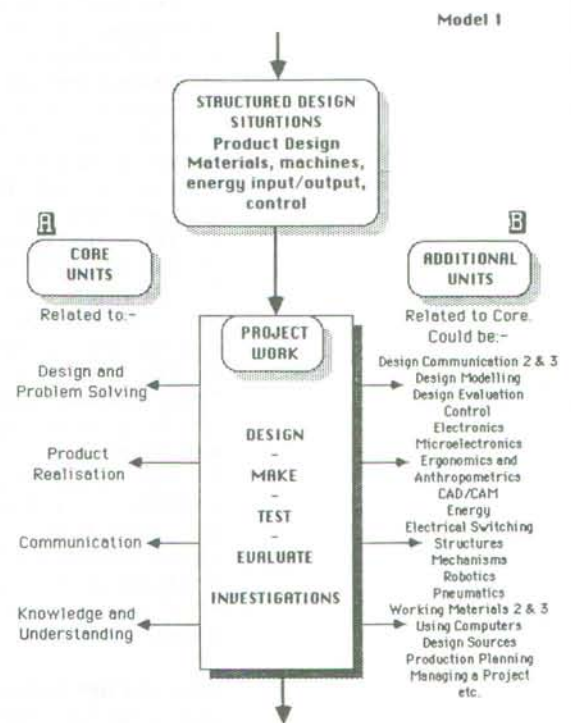
**DOMAIN 3**  
Design Communication

**DOMAIN 4**  
Knowledge and Understanding

At the heart is the process of designing, making, testing and evaluating. The core units will encourage and support this activity, and are considered essential to provide a solid foundation. The additional units are viewed as 'off the peg' resources, available as interest in particular areas develops through project work.

**Method**

(The description that follows refers to Model 1). A and B in the model are implemented through a structured open learning situation with units which have a target time for completion e.g. Control, Design Communication Techniques, Working Materials etc. A represents a core which is common to all, B additional units specific to projects/investigations.



To integrate Design and Technology, the core package could consist of Design Processes, Modelling, Communication Techniques, Working Materials and Using Components, Control (electronic, pneumatic, mechanical) and Energy.

The additional units could be as diverse as Robotics, Industrial Design Modelling Techniques, Ergonomics, CAD/CAM, Food Processing, Textiles, elements of Information Technology, Using Computers etc. (for a core Technology course), but initially would be relevant to the integration of existing Design and Technology subjects in schools.

**Time Allocation for Consideration**

- Major projects/investigation 50%
- Common core units 20%
- Additional units through research 30%
- Circa four hours per week.
- Package time twenty minutes to six weeks maximum.

To add a scale dimension, the following are packages which could exist to support the three GCSE options, Design and Realisation, Design Communication, and Technology. The list is by no means exhaustive. No attempt to identify the 'common to all' (see syllabus/learning model) or 'additional' units is made at this stage, though it must be stressed that the success of the system operating in school is dependent on ALL the packages identified as 'common to all' being available. 'Additional' units could reflect the equipment available, which varies from school to school.

Design Introduction	Design Communication 1, 2, 3,
Design Modelling	Ergonomics and
Design Evaluation	Anthropometrics
Control	Working Materials 1, 2, 3
Electronics	Energy
Microelectronics	Electrical Switching
CAD/CAM	Robotics
Structures	Pneumatics
Mechanisms	Using Computers
Managing a Project	Producing Planning
	Design Sources

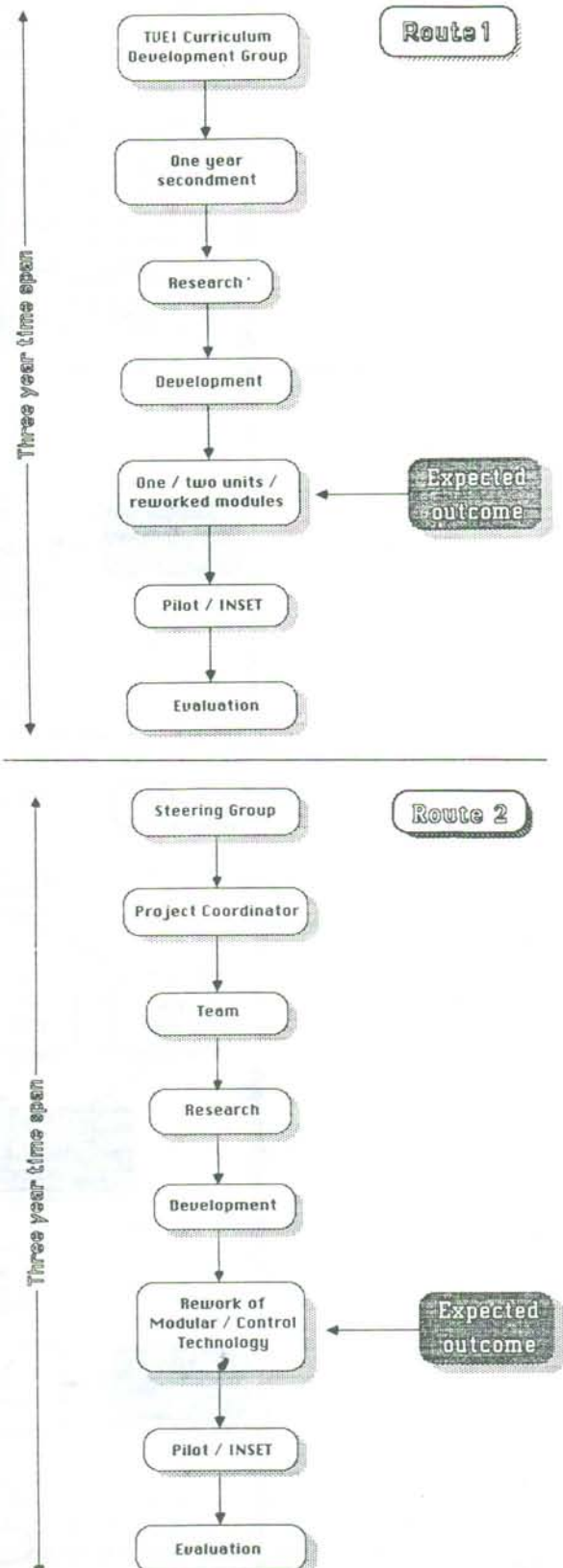
#### Strategy for Implementation

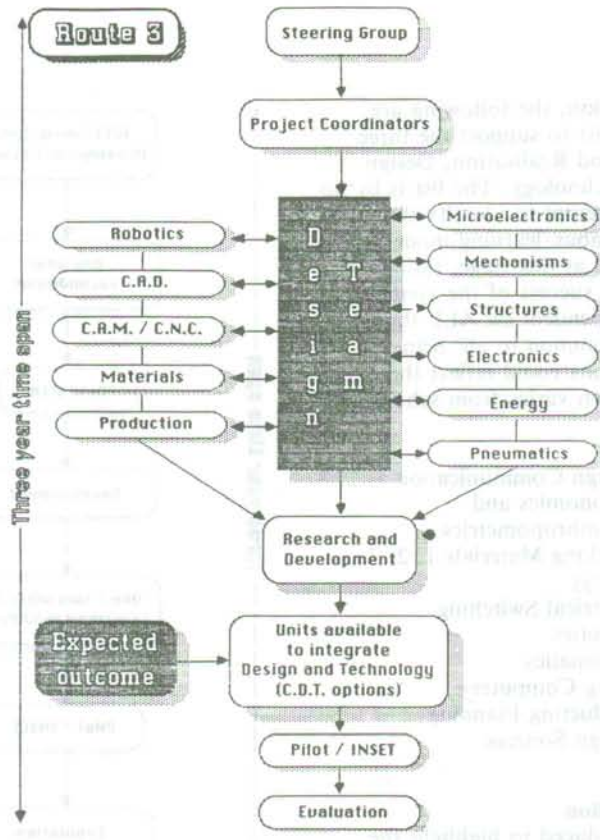
An Initial Study was produced to highlight the resource implications. Four routes were identified, and expected outcomes made clear. These were based on research into the costs (finance, time etc.) of existing Open Learning material. The first two routes are concerned with Modular/Control Technology, the third with the Integration of Design and Technology subjects as they exist in schools, and the fourth with a view to providing a core Technology course. Feedback from this document confirmed that routes three and four were the most desirable, route three being the most plausible.

The route models were recognised as crude expressions. Having identified route three, the model was refined, and, as a result of discussion between British School Technology and Suffolk LEA, a project proposal has been formulated.

An Open Learning Unit would act as the focal point, offering a professional design and production service, piloting materials within the Suffolk TVEI group and Suffolk schools. They would then be promoted nationally by BST, when trials have been successfully completed.

The unit will employ four managers to handle identified learning material provide by part-time seconded teachers, authors, teacher support groups, 'experts' etc. The aim is to achieve the most cost effective, yet thoroughly professional output, and it is anticipated that these members of the team will operate at a distance using electronic mail systems e.g. The Times Network, British Telecom Gold. CAD and word processing facilities will be used to edit, and written information will be directly transferred to a commercial Phototypesetting





system. Text is viewed as only one method of communication. The emphasis will be on an overall learning/resource pack using a variety of stimuli.

A plausible future scenario? Perhaps a collection of wild, eccentric ideas? Whichever viewpoint is taken, the importance of Open Learning systems applied across the curriculum, especially in the secondary sector, must not be underestimated.

