The Community 'Helping Others': A Year Eight Design and Technology Project

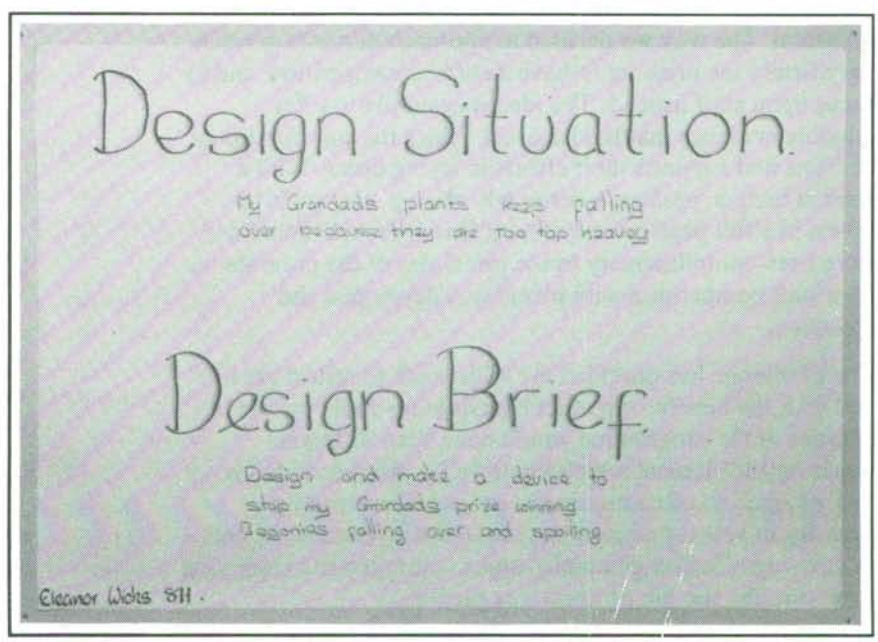
Brian Williams
Brimsham Green School, Yate
Bristol

During the past term the whole of year eight (150 students) have been working on a variety of design problems based upon the theme of *helping others.*

The project was introduced by showing the students various aspects of the local community and asking them to choose one area of particular interest. During a lead lesson slides, of many situations, were shown and groups of 18 to 20 students discussed a range of possibilities with their group teacher. They were encouraged to think laterally about the context so that every possible area was considered. After analysing and researching their chosen topics, students were able to identify potential problems encountered by the various groups of people. Further research and investigation helped to secure their understanding of the problems. For example, a brief study of an elderly person, suffering with arthritis, revealed the need of help in collecting their delivered mail from the front door. There was a variety of approach used at this stage, written surveys, interviews with elderly and young people and practical trial sessions to establish the nature of the problem included journeys around the school in wheelchairs.

The list of identified problems is endless but they cover a wide range, from those connected with infant children, through their own age group, to community groups and on to elderly relatives or friends.

Each problem required a *Design Situation* (the background to the problem as seen by the student). Eleanor has a grandfather who is a keen gardener. Being elderly, naturally his mobility is restricted. His begonias, planted out in pots, often blow over and the contents spill out onto the patio. 'My Grandad's plants keep falling over because they are too top heavy'. Each group or student wrote their *Design Brief* (a statement of the problem in simple terms, so that others could understand what was being attempted). Eleanor's 'Design and make a device to stop my Grandad's prize winning Begonias falling over and spoiling'. The *Design Specification* came next and this involved clarification as to what their design had to achieve. Matthew's device to help an elderly person open windows, had to reach a certain distance, be easily



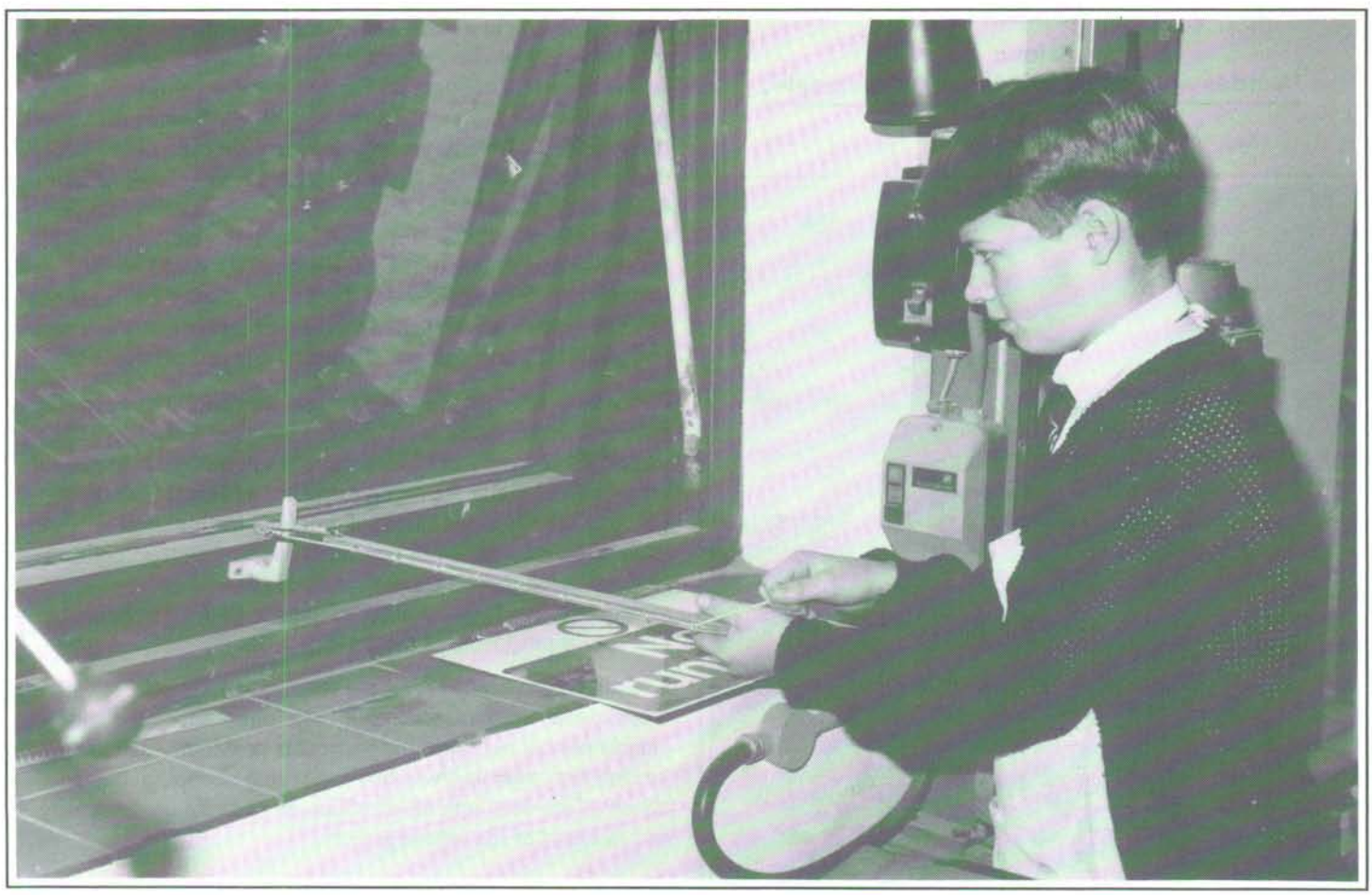
Above: Analysis provided potential problems

Below:
'Matthew's device to help an elderly person open windows had to reach a certain distance, be easily operated...'

operated, clutch a prescribed type of window catch and not weigh too much.

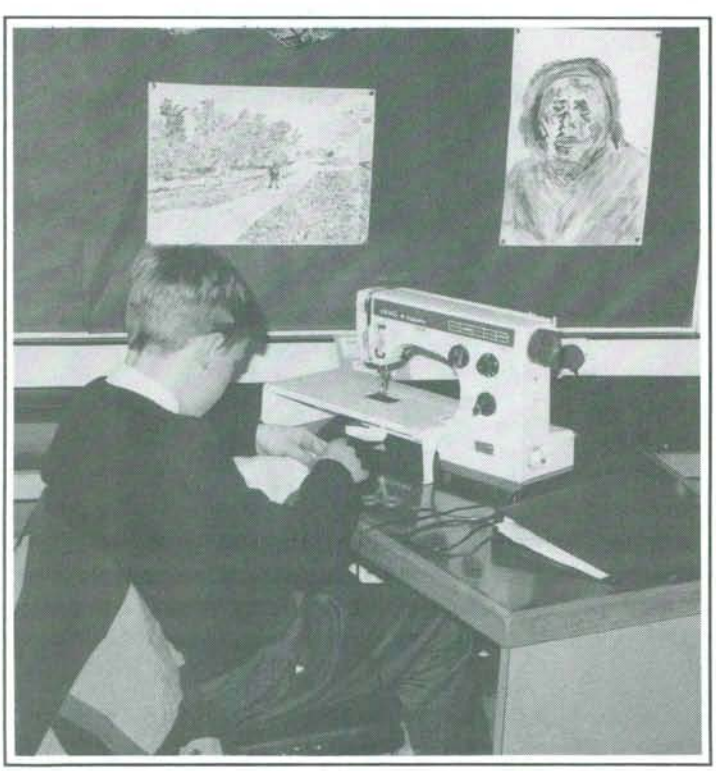
When the students were clear about their targets, they made *Design Proposals* these consisted of ideas as to how the various problems could be solved. Drawings and sketches with notes expressing the many possibilities came rapidly and with ease. Much discussion took place at this time and some of the ideas were developed through trial and error. There was no restriction placed upon the ideas, materials or equipment and teacher expertise was not used as a limiting factor at this stage. Teachers advised students and offered their services as consultants. Where particular expertise was required, it was given to support the progress of the designing thinking, rather than to make decisions on behalf of the students. Towards the *Development* of their designs (where final decisions are necessary) there had to be more teacher guidance and use of teacher/subject knowledge. Models were manufactured, design situations were set up to experiment with the notions, materials were tested. A practical test convinced Gareth that a piece of timber could not be bent through ninety degrees, to make a handle. He concluded, with help, that a piece of square steel tubing was a better choice.

Naturally there were changes of mind and some students found the decision making process one of the more demanding parts of the project. Teachers, at this juncture, were getting nervous as to what the outcome might be and spent many hours discussing the apparent problems of Sophia and George who wanted to make a full size automated robot that would help Granny with the shopping, Sophia and George could see no problems at all.



Above: 'Drawings and sketches... came rapidly and with ease'.

Below:
'Articles were made in a variety of materials'.



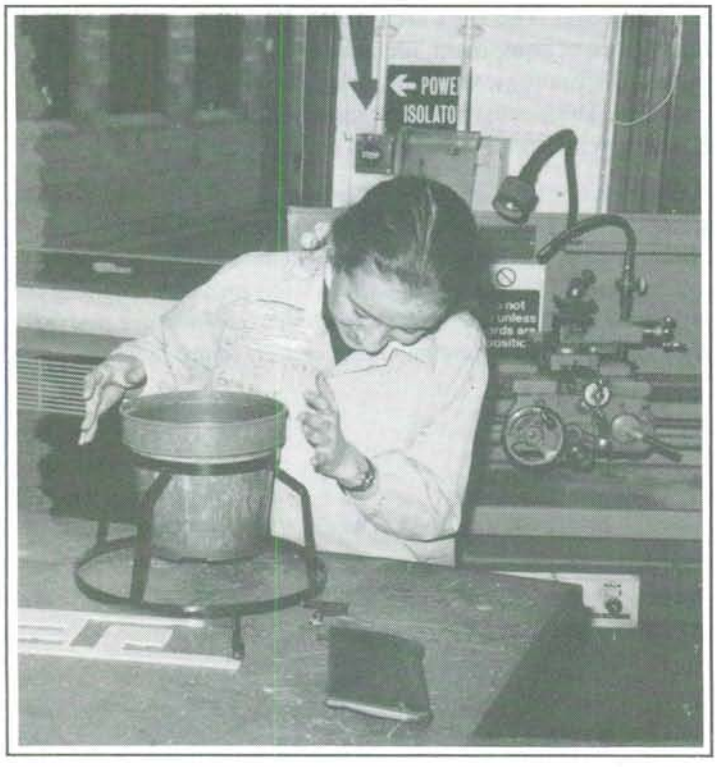
During this tense period of time there were doubts as to whether we would survive the voyage through yet unknown waters. Was there a choice? Should we continue or jump overboard and swim back to our comfortable islands where we were certain of success? True grit and determination prevailed and we set sail on the next stage. Having discussed the foreseen problems and missed many of the others, we decided to identify the likely outcomes into groups, according to the materials and teacher expertise. This proved successful in most cases but inevitably there was imbalance in numbers and some mixed outcomes. So the students could now complete their designs and fully develop their chosen ideas. We had groups working in a mixture of fabric and food, wood and plastics, wood and metal, electronics and plastics etc.

There were new names and new teachers habits to learn. The students settled quickly and before long we were all *Planning and Making*, always a chaotic time when materials are being prepared and skills are being refreshed or learnt from new. Designs needed amendment and the realisation that something may not work begins to dawn! The whole year group entered this phase with enthusiasm and energy (teachers as well) the thought of their own designs being put to a useful purpose was the driving force.

Ambitious projects like, ramps for areas of the school where wheelchairs were unable to go, help for handicapped and elderly people to overcome particular problems such as turning taps, opening windows, carrying shopping, being aware of the doorbell, all of which go to make up the reality and richness of the whole project.

Above: 'The making phase was entered with enthusiasm and energy'.

Below: 'The thought of their own designs being put to a useful purpose was the driving force'.

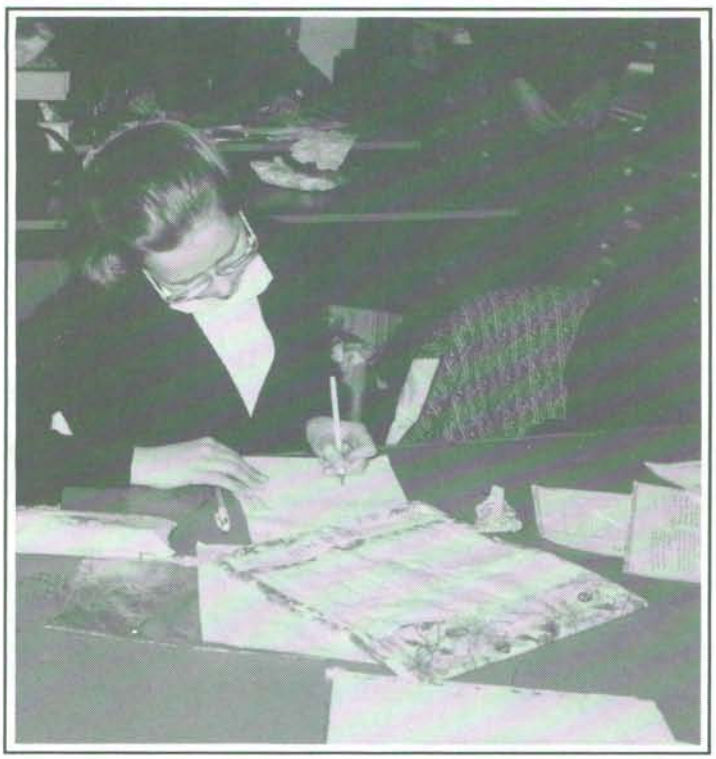


In any one group there was a variety of different activity; keeping up with the pace at which the practical went ahead, was difficult. There was need for extensive use of the supportive education teacher, who has a specialism in design and technology, he was able to supplement the skills where required and in the same process offer some in-service training.

As the practical work came to conclusion the adrenalin started to flow. Would the solution solve the problem? Would the wheelchair fit? Will the bag fit on the zimmer frame? Will the stair barrier safely stop the baby from falling or climbing? Anxious moments for teachers and students as the final stages were reached and the final evaluation began.

The correct facilities and environments for testing were required and often this aspect caused concern. Those problems that centred around the school environment, access for wheelchairs and independence for those using wheelchairs, were very real and could be tested easily. It was necessary to be fair but due to the nature of some of the projects, it was not possible to test under normal circumstances. The students were mature and realistic about the targets and were able to be self critical and offer constructive alternatives for the improvement of their designs. Realistically, much evaluation had taken place during the making and many changes were brought about, as a result of experience, to ensure a degree of success.

Often the students themselves were harsh judges of their own competence and inflicted severe criticism on the work of their peers. This led to heavy debate and discussions as to what



'Will the bag fit on the Zimmer frame?'

'Access for wheelchairs can be tested easily'

was the '*best design*'. The criteria used for evaluation was based upon the design specification and comparisons were made between the original thoughts and the final outcomes. The local Yate and District Rotary Club supported the school in holding a small exhibition of the work and also donated three prizes for the most promising designs.

As the title suggests the results are impressive, many doubts have arisen about the practice of implementing the philosophy of the '*holistic approach*'. The demands of time and teacher specialisms cannot be met (to achieve this, there will need to be massive investments in inservice training). There have been numerous debates about the loss of some practical skills in any one of the specialisms covered. Without doubt we have realised that the ground has shifted and the traditional expectations of the specialisms have changed.

Whether as a profession we agree with this is contentious enough for a whole debate on its own. The skills are different and include aspects that have hitherto not received so much emphasis. The response from the students has been positive, if enjoyment is a criteria for judgement, both staff and students would rate the project highly.

There seems to be a dichotomy between the theory of the Technology Statutory Orders and the practice of making it all happen in a school. How can we reconcile the prescriptive nature of what is expected at each Key Stage and the statements of attainment that indicate levels of achievement, against the overwhelming intrinsic value of the student leading the activity to a worthwhile design outcome? There is a limit as to how much manipulation can be imposed to ensure that the Programmes of Study are covered in all aspects by all students. There is a need to provide each student with the opportunity to develop to their full potential. The outcome of labelling students with levels of attainment at each Key Stage will restrict their opportunity to develop by imposing structured hurdles.

The notion of a National Curriculum in Technology seems dubious if there is no clear understanding of what is meant. At present there are as many interpretations as there are people taking part. We understand what we see as the important aspects for our students, our facilities and our teaching team. There are areas that we are unable to cover due to lack of equipment, ideal premises, rooms and facilities but our Technology, we think, is *off the ground* and making progress. There must be many more, Secondary and Primary Schools, who find themselves in similar positions.

Brimsham Green is an 11 to 18 comprehensive school of 830 students. The Design and Technology faculty teaches mixed ability groups for 10% of the curriculum time. Tutor groups are timetabled together and sub-division provides teaching groups of approximately 18 to 20 students. There are five full time and three part-time members of staff in the faculty.