Creativity and Formal Skills – Finding a Balance

Can creativity only be achieved at the expense of formal skills? The writers describe important experimental work at Millfield School that involves the use of educational technology to help students to learn skills when they need them.

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Recent trends in Craft Education have been towards design studies and creativity. Already, there are the seeds of a revolt against this approach. Results from, and observation of, children, would suggest that a lack of theoretical knowledge and an absence of skills can result from an over emphasis on creativity. Surely, the test of any education should be the application of acquired knowledge to new situations. Many would claim that the creative approach has failed this test. Although the child may solve the problems involved in his project, he will often find this solution has no further application to subsequent work.

And yet, a return to the formal skills teaching methods of yesteryear will not satisfy the educational need of the modern child. Pure joints and filing by 'number' have no real application or appeal in a technological age. Regimentation is not possible in an age which has encouraged critical thinking and individuality. It is unlikely that personal satisfaction will result from a situation where each child is engaged upon the same project. The increased complexity and the diversity of children's toys adds to the demand for the individual project.

Certainly, the creative approach does allow for the expression of ideas and encourages the child to look for a solution to problems. These values, which are the essential contribution of the creative approach, must be retained and linked with traditional craft skills. Fundamentally, what is required is a balance between creativity and formal skills. We need an approach which encourages children to solve design problems through the application of traditional practices. This would capitalise on the motivation of the child and, therefore, skills can be introduced as an answer to a definite need.

Having determined a philosophy, and stated requirements, it is difficult to reconcile these with existing school conditions. In any school, the workshop teacher will be faced with some twenty, or more, individuals all demanding their right to undertake a personal project. How then can he attend to all the problems at one time? Obviously, the group demonstration, which for many years was the backbone of craft teaching, cannot fulfil individual requirements and personal demonstrations for each child are impossible because of the number involved and the time available.

At Millfield, the problem is further complicated by the system of individual timetables for pupils which results in mixed ability groups of all ages within the workshop at the same time. Few pupils have double periods in craft subjects and very few come to the workshop with the same group on each occasion. At any one time, there may be pupils

studying for 'A' level Engineering and junior children undertaking their first project. The workshop is equipped with machinery for a wide range of processes with very little duplication. Thus, very few pupils can work on the same task as others within the group. For us then, the requirements of our philosophy and the dictates of our situation make it vital that a method of individual learning be introduced.

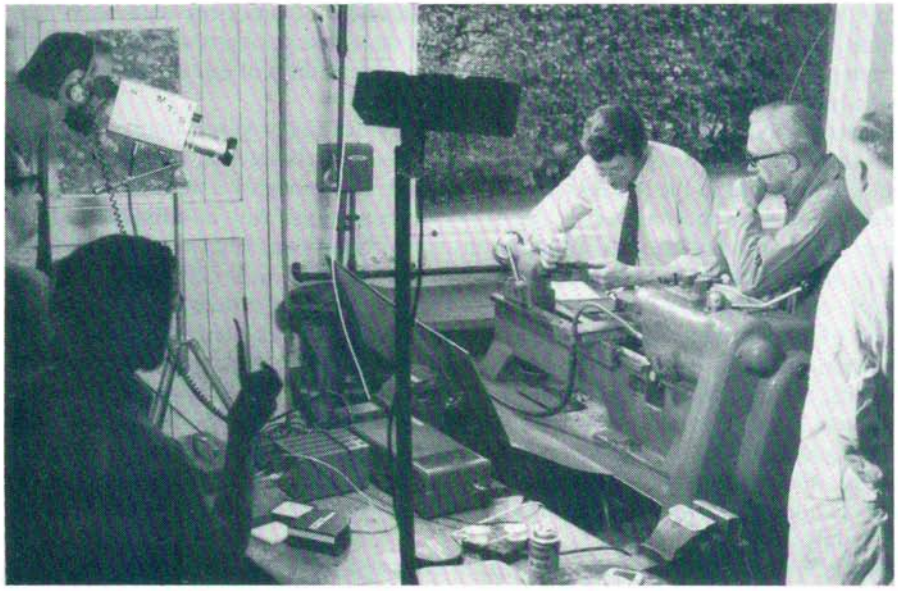
Fortunately, Millfield is a school that has believed, for many years, that educational resources should play an increasing role in children's learning.There was, therefore, a wide range of aids available to the teachers of craft subjects. It was largely a matter of selecting those aids which were most suited to the workshop conditions. Any installation within a workshop has to work with little attention in dusty conditions. What was required was machinery which was simple in operation and undemanding in teacher time. In addition, a large supply of 'software' was required to cover the wide range of processes.

The use of 16mm films, 8mm loops and slide/tape programmes could not satisfy these requirements. In each case, they would suffer from the effects of the workshop environment, would demand teacher time and would occupy bench space which could not be spared. Thus, the traditional classroom aids were rejected and our attention turned to newer devices which were now available to schools. The advent of the inexpensive helical scan video tape recorder has made it possible for the teacher to use and control television to meet his own requirements. It seemed to us at Millfield that this device suited our purpose.

A television service, which had grown from the need to record and replay broadcast educational television, already existed within the school and, indeed, its services had already been used to record and replay the B.B.C. Series 'Engineering Craft and Science'. (This proved to be of limited value because the programme content was not designed for school use and the withdrawal from the workshop to a viewing room resulted in loss of impact and time.) It was a logical step, therefore, to seek for the extension of the distribution line, which already supplied some academic departments, down to the workshop area. This meant that programmes could be replayed from a central source to television monitors in the workshop itself. Programmes could be replayed on demand and not restricted to pre–arranged times.

Two television monitors were mounted in the darkest corners of the workshops. And because it was essential to ensure that television sound did not distract the attention of pupils working with machinery, a separate sound system was installed. This involved the provision of headsets to allow pupils to hear the programme commentary at the workbench. This had the additional advantage that the noise of machinery did not disturb viewing.

It was impossible for this installation to be dependent upon commercially produced material or upon broadcast educational programmes. A television series had to be especially written and produced for the system. The metalwork department has built up a library of programmes over the past four years at a rate which has now reached two programmes per week. These tapes vary in duration from ten to twenty minutes and are especially designed to cover essential skills. They are made during normal teaching periods and are completed in forty–five minutes. Programmes are not scripted and the only preparation is a brief discussion between the director of the television unit and the staff concerned with the presentation of the programme.



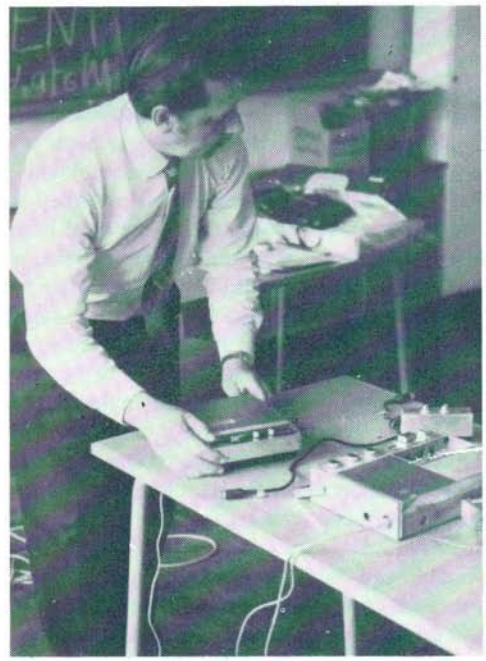
Roger Cryer showing T.V. presentation to the recent teachers' course.

Individual skills taught by T.V.

Opening captions and introduction music have proved to be unnecessary luxuries because the programme viewers need the information quickly. The programmes are therefore simple, direct and balanced with theoretical knowledge to suit the skill. They are not intended to duplicate the professional product of the B.B.C. and I.B.A. They are intended as an aid which provides the teacher with a demonstration of skills which can be used for individual pupils. Essentially the teachers are presenting themselves on television in much the same manner as they would present themselves to pupils in normal timetabled periods.

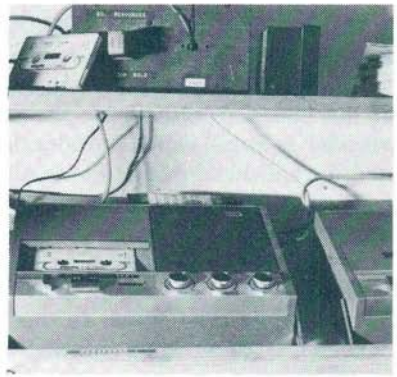
The television unit uses a two man team for these productions. The cameraman also monitors programme sound while the producer also acts as lighting engineer. A radio microphone is most suited to this type of production because it allows the presenter maximum freedom while ensuring that the machinery noise is not present on programme sound. Lighting can be provided by quartz halogen lamp on portable stands. These are strong enough to provide good quality television pictures from the darkest corners of the workshop.

At a later stage, programmed learning techniques were allied to the television programmes to provide further sources of skills teaching. Although programmed learning has been used for many years in industrial workshops, it has largely been confined to written programmes. This, we felt, to be unsuitable for children with slow reading speeds and our system had to be successful with all levels of ability. Audio Visual programmes ensure that the system is not dependent upon the pupil's ability to read quickly.



Above: Pupil calls for T.V. programme.

Right: Mr. Spencer Griffith preparing Programmed Learning Material.



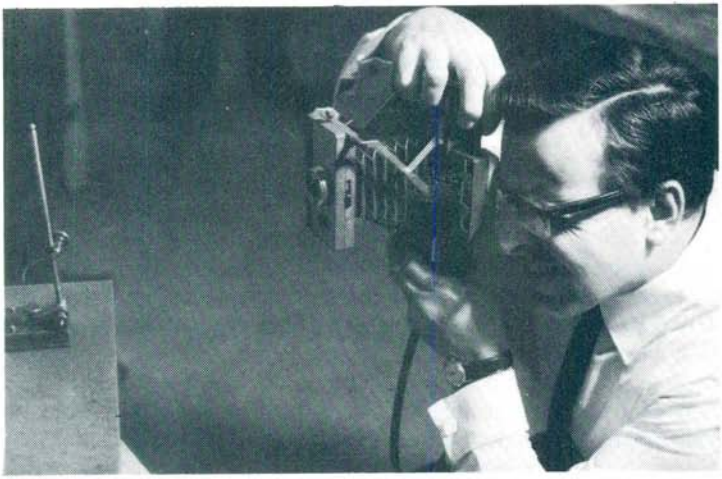
Philips 1011 & Auto-stop unit.

A pupil using the Programmed Learning Tape on the Lathe.

A cassette recorder, which has been programmed to stop at pre–arranged intervals, was linked into the television sound system for individual listening via headsets. The Philips 1011 Recorder, which is intended for use with a slide projector was chosen, and the pulses on the lower track were used to activate an auto–stop device. The programmed learning material involves the pupil in the process while he is receiving instruction. On the bench, all that is required is a button to re–start the recorder and a booklet containing photographs and diagrams. Thus, the pupil's hands are free to operate the machinery during the process and he only needed to press the re–start button when he was ready to proceed to the next section of the programme.

Naturally, the programmed material took time to develop. In each case it had to be written several times before it was suitable for pupils of all levels of ability. The Millfield Educational Resources Faculty was fortunate enough to have an experienced programmer in Mr Spencer Griffiths who became interested in this project. At present programmes are being produced at a rate of four per term using a Polaroid camera to provide the pictorial material.

The programmed learning material is most suited to bench processes because it proceeds in small steps with the pupils involved at every stage. The television programmes are especially valuable in the teaching of machine skills. The viewer is placed in the best



Using a polaroid camera for booklet preparation.

position to benefit from the demonstration and his attention is directed by the close–up shots to everything that the teacher would wish him to see. Thus each child receives the best possible demonstration of the technique and can go directly from the replay to performing the skill for himself.

At Millfield, we have found that four sources of skills instruction are sufficient for twenty pupils and allow the teacher to devote his time to individual problems. It is interesting that the pupils who have experienced this form of learning, believe that they have discovered the skill for themselves. They do not associate the information that they have gained from the resources with the teacher in the workshop and they have a great pride in their personal discovery. The system increases enthusiasm, develops confidence and makes skills meaningful because they are not applied for their own sakes but are attached to the real needs of the child. Thus creativity and traditional skills are not alternatives. Each is required if the design project is to stand the test of good workmanship.