Evaluation in CDT Through Structured Group Work

Robert Farnham and Harold Wightman
Beaver Hill School, Sheffield

Evaluation by students of their own design and finished articles can be a very difficult process both for the students and for staff. Some teachers tend to leave the teaching of evaluation until it looms up as a requirement of the examination, but it is then a doubly difficult task to develop in students the attitudes and approaches they need.

The difficulty of evaluation was first identified as a major problem for us through analysis of a lesson with some 12-year-olds. The lesson was being observed by an Assistant Head during a year's secondment. The class teacher had invited comment on the development of a newly introduced Design course to replace the traditional separate Crafts. By this stage of the course, the mixed-ability class had spent some weeks designing an object in response to a design brief. They had gone through the process of finding a range of possible solutions, choosing the 'best' solution and then making it. Now came the difficulty — students were at a loss to answer the question on the evaluation sheet which asked, 'Does the finished article satisfy the demands of the original design brief?' Other teachers were also at a loss: they all found it only too easy to give an evaluation of the article, but did not know how to lead students' thinking into the same path.

This dilemma reminded the Assistant Head of the question posed by Graham Gibbs: 'Why not just tell students how to learn?' Graham Gibbs is a writer and lecturer who is expert in helping students in Higher Education to develop skills and effective approaches to study. His reasons for not 'telling them how' also seemed relevant to the evaluation process and to the predicament of our 12-year-olds. In simple terms this means that until the students understand *why* and *how*, there is little value in knowing *what* is good or bad about their artefact.

A range of other ideas persuaded the CDT Department to put some thought and effort into building up a classroom procedure that would enable teachers to obtain a whole range of benefits associated with student-centred learning and experiential learning. A recent report by HMI had made a general statement that seemed applicable to this aspect of CDT; it claimed that the new philosophy of the school (resulting mainly from the appointment of a new Head) was not being implemented at classroom level. In Craft terms this meant that too much attention was being paid to 'correct' solutions and 'proper' techniques rather than to the development of students' sense of design and ability to solve problems. In other words, there was too much emphasis on the product and not enough on the process. Another significant problem lay in students' inability to express their ideas and opinions. A way was needed for the teacher to extend students' vocabulary and self-expression.

The answer to many of these problems seemed to lie in an adaptation of a technique called Structured Group Work which is advocated by Graham Gibbs. If properly handled, this would give students the chance to learn from the faults in their design, an opportunity to reflect on the deeper principles involved in design, and peer-group assessment of their work. The teacher's role would then become that of facilitator by drawing attention to important issues, feeding in the appropriate vocabulary and clarifying the principles involved. A procedure was worked out and tried with another class of 20 students who had been set the same problem; the scheme worked quite well first time. The pattern we now recommend is as follows:

STAGE ONE: Teacher tells whole class that 'evaluation' is the job for the lesson. A short introduction is given for students for whom this is a new activity. The original design brief is reviewed, attention being drawn to the salient points. Students collect all documentation and artefacts, then sit in pairs. The pairs are chosen by students; the teacher intervenes minimally.

STAGE TWO: The teacher tells the class that each partner will look at the other's work, to identify and note down positive, negative and 'interesting' aspects (at least three positive aspects). After, say, 10 minutes students exchange views and discuss the implications, reasons for problems, success, etc.

STAGE THREE: Pairs join to form groups of four students to compare notes and identify similarities in order to establish general points about successful designs, to identify the characteristics of good designs and artefacts, and to note any particularly ingenious or striking aspects. These are written by one member of the group.

STAGE FOUR: In a plenary session, group spokeswomen state the groups' findings. The teacher involves all students in discussing the suggested points; agreed items are written on the board. (These can be separated into categories as seems appropriate, e.g. positive characteristics, major errors to avoid, etc.)

STAGE FIVE: Individual students write up their own evaluation, referring to the brief and the criteria on the board. If there is not sufficient time to finish this in class, it forms an ideal homework. The marking of the evaluation is important only in so far as it gives it value in the students' eyes. The main value of the evaluation lies in its function as a crucial stage of the learning process.

The role of the teacher in this process is the key to its success: in stage one, a verbal reminder of all the demands in the 'brief' is needed, but it must be concise and business-like, rather than domineering or threatening. Students need to be encouraged to be sensitive in giving feedback on their peers' work. Instructions about stage two are not given until stage one is complete. Discussion between students is to be encouraged, but they need to be told firmly to keep the discussion on the central idea of the principles and details of design (not on social chat!). Students should be encouraged to say *why* they chose a particular solution. Also in stage two, the teacher will listen in to groups and ask questions to focus attention on key issues: 'Why did it not work? How could you improve it? Where did you find that idea?' The teacher also has the option of calling the attention of the whole class to a particular aspect which one group has discovered or which too many students are ignoring; this also provides the ideal vehicle for giving students the words and phrases both to express new ideas and to develop those ideas through further discussion, either as a whole class or in the pairs. For stage three, students will probably need guidance and suggestions about what constitutes a 'general principle' or a 'characteristic of good design'; the teacher should suggest one or two points (not all the

obvious ones!), then leave students to work out the others. Again, the teacher will be able to help by listening in to the group discussions and prompting by carefully worded simple questions. This role of the teacher needs great sensitivity and self-control; it would be only too easy to tell the students 'the right answer'. Real learning for students, however, will come only from the process of thinking and arguing things out for themselves at their own level of understanding. During stages three and four this level of understanding will grow for all pupils, provided that the discussion is not forced to too high a level either by a great disparity between students or by an over-eager teacher. At stage four, care must be exercised to avoid leaving some students behind; the level of English needs to be pitched carefully. It may even be appropriate to write up the general principles in two 'registers'; for instance, 'High centre of gravity' under the heading 'Major errors to avoid' may need the addition of the phrase 'top heavy' until students are familiar with the new phrase. For stage five, it may be appropriate to allow pupils to write 'top heavy'; alternatively, this could be one of the central aspects of the design brief and a key item to learn, in which case the teacher will need to extend the discussion around this theme to ensure that every student has mastered the phrase and will be able to use it in the individual evaluation.

The disadvantages of this style of teaching (a form of experiential learning) are more apparent than real. The first concerns the attitudes of the teacher. Some teachers find it very difficult to give up the dominant controlling role; others find it frustrating to let students think through their own problems at their own pace, and prefer to tell them the answer (in the mistaken belief that the students will believe *and* understand *and* remember the answer!) Secondly, it may well be felt that the process takes far too long. Certainly, the exercise takes longer than a simple, one-off evaluation should, but this process also achieves far more: it develops students' ability to communicate, it deepens their grasp of concepts and it extends their understanding through application of general principles to specific cases. Thirdly, this process makes some students very uneasy: they feel frustrated when the teacher refuses to tell them the 'right answer'. Such pupils may just need a few words of encouragement, or they may need an explanation of the reasons behind the scheme. In any case, many students will need to be brought to the possibly uncomfortable realisation that they are being asked to take responsibility for their own work. Any change in role tends to be resisted (by students as well as teachers) and will take effort to establish. Lastly, the teacher has to do most of the really hard work before the students ever see the design brief; the insights and learning that the teacher wants the student to attain must arise out of the experience of working through the design brief, and the teacher uses the evaluation to lead students to a fuller understanding of the principles involved. If the ideas and principles that the teacher intended students to meet with do not naturally arise from carrying out the design and brief, then they must be left for a later session (which will need planning with even greater care).

The advantages of this approach are more important than any drawbacks. Firstly there is the tangible fact that students are responsible for their own learning; they grow in confidence and motivation so long as the teacher remains a facilitator — asking, prompting, reminding, feeding the appropriate vocabulary and developing students' thinking. Secondly, the comments of peers are taken at face value (unlike teachers' comments which are often taken with a large pinch of salt!), yet students feel free to argue with peers about matters of design and thus deepen their understanding of what is involved. The time spent by each student in constructive criticism of her own work is far greater than under any traditional pattern of classroom organisation. Thirdly, the teacher is freed from the function of judging students and their work; this allows a more productive relationship to develop. Fourthly, the teacher is totally aware of students' level of interest, motivation and understanding; this informs the next unit of work and also improves assessment of students. Lastly, the students actually 'own' the final evaluation and have internalised the principles that it embodies, since they have established the criteria for a successful design and applied them to their own work.

The most important result of adopting this style of evaluation did not show itself immediately. Some months after we first tried this approach, however, it began to affect the conduct of other lessons. Teachers are now more aware of students' point of view; they tend to avoid put-down comments like 'That's not very good' or 'I don't like the proportions of that'. Instead, they say: 'Do you like that? Can you think of any improvements?' or 'Does that meet *all* the demands of the brief?' There is more praise of students' initiative — and consequently more initiative. The centre of interest in everyone's mind has shifted from the teacher's control of the class (and the resulting student resistance) to a cooperative mood and a focus on the intended aim as stated in the design brief. In turn this new situation makes for a more speedy evaluation session, because attitudes have already been prepared to facilitate it.

For anyone wanting more detail or a deeper rationale of Structured Group Work, reference should be made to Graham Gibbs, Teaching Students to Learn. A Student-Centred Approach. Open University, 1981.

(Robert Farnham is a teacher of CDT and Harold Wightman is Assistant Head at Beaver Hill School, Sheffield. During a year's secondment in 1985/6 to the CCDU at Leeds University, Harold Wightman researched Study Skills and Learning Styles, working alongside colleagues in various departments).