

The long-term effects on schools and staff of in-service courses for teachers of primary design and technology

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Abstract

A new curriculum subject, design and technology, was introduced into schools in England and Wales as part of a National Curriculum in 1990. In-service training for primary teachers of design and technology is an essential feature in the development of this new curriculum subject. This has taken place partly through the Grants for Education and Training (GEST) funded courses ranging from 5 to 20 days in duration. While a short training course might be evaluated for its content and modes of delivery, the effect of the course on the school itself is of much more interest and concern. Without a knowledge of the degree of change that the course has brought to pupils and teachers, an evaluation of the course will not be complete.

This paper describes the results of two surveys which set out to gauge the degree of change perceived by course participants in schools as a result of GEST funded courses over the past four years. The analysis and conclusions provide indications regarding the effectiveness of the courses and suggest where improvements might be made. Many of the conclusions and recommendations would apply to a wide range of in-service courses in all curriculum areas.

Introduction

In 1990 a new National Curriculum for design and technology for primary children was introduced into state schools in England and Wales. Although primary teachers had always taught elements of design and technology in science, art and craft and within a range of related subjects, design and technology was defined as a new, single subject, bringing with it its own unique rationale. It soon became apparent that the nature of the subject needed further understanding before it could be taught effectively in schools.

No national organised programme of in-service work was set up as the National Curriculum was introduced and thus the majority of teachers had little support to aid implementation of the subject in school. It was not until 1993 that GEST funded courses for primary coordinators of design and technology began in England. Local Education Authorities (LEAs) had to bid for

finance from the government in order to run them and they were delivered, in the main, by Higher Education Institutions or advisory teachers or a combination of the two. Initially the courses were of 20 days duration but since 1994 they have varied in length from 5 days to the original 20 days. The Department for Education (DFE) defined the content and set out specific criteria for all courses (DFE, 1992) which it then validated where appropriate. In addition, courses were validated by Higher Education Institutions thus enabling participants to obtain post-experience or postgraduate awards on completion of a written assignment. Indeed, this was encouraged by the DFE and one criterion for successful validation was the opportunity for participants to gain an award from the course.

Whilst a comprehensive evaluation of the first courses of a similar nature in mathematics and science was carried out in 1992 (Harland and Kinder) there has been little or no formal evaluation of such courses for design and technology. Now a joint evaluation has been carried out of the long term effects of GEST funded courses held at the University of Central England and Warwick University during the academic years 1993/4, 1994/5 and 1995/6. The intention was to survey the course members' perceptions of the long-term effectiveness of each course. General trends were sought within the results for a range of courses.

Brief description of the courses

The courses at both universities had a common core of key elements which had been identified by the DFE as a requirement for validation and were planned jointly with the universities and the LEA. The common elements included the development of teachers' own knowledge and understanding of design and technology, the exploration of the inherent processes of design and technology, their ability to plan and implement the subject within their schools, the development of the teachers' own practical capability and the exploration of issues relating to the role of the primary school coordinator for design and technology. The length of the courses varied between five and twenty days and on average fifteen teachers participated in each course. A majority of the participants were

coordinators for design and technology or were to take on this responsibility shortly. The role of coordinator involves ensuring that design and technology is implemented effectively in the school and offering support to all staff to enable this to happen. Many of the participants were also coordinators of other subjects, mainly Art, Science or Information Technology. All courses were delivered in the Higher Education Institution in specialist rooms containing a wide range of published primary school materials, tools and equipment.

Survey rationale

It is important to be clear about the intentions of both of the surveys and to recognise their limitations. The main aim of the surveys was to gather information on the perceived changes within each school as a result of the courses attended. Some schools, which were already doing well in this subject, therefore, may have witnessed relatively small improvements. Generally, however, teachers were chosen to attend the courses because the school had identified a need for improvement within the subject and thus design and technology was part of the school development plan. Moreover, this was a recommendation from the DFE in their original brief relating to course construction.

The first part of the survey focused on three main areas of potential change. Respondents were asked about the perceived change to themselves as course members, some of the staff at their school and the whole school staff. Due to inherent difficulties in gauging change that an in-service course makes within a school, it was recognised that the analysis of the results should involve looking at general trends rather than individual results. The first survey was carried out with those participants who attended courses in 1993-5. The data was analysed and conclusions drawn and presented at the International Conference on Design and Technology, Educational Research and Curriculum Development (IDATER) in 1996 (Benson, C, Johnsey, R, Wiggins, D). As a result of this work, a further survey was carried out with those attending courses in 1995-6, thus enabling the authors to make comparisons between earlier and more recent courses.

Methodology

The surveys were carried out through the use of a questionnaire, sent to members at least one year after the end of the courses. It was felt that this had a number of advantages. It gave respondents the chance to consider their own answers without being unduly influenced by those who had run the courses themselves. It was one of the least time-consuming options as far as the course members were concerned. It allowed time for reflection and changes effected by the course. It made it easy for teachers not to participate, if they so wished. In this respect the survey responses will reflect the views of those who were interested enough to reply to the questionnaire. The questions were arranged around three main areas of interest:

- teachers' subject knowledge and their understanding of the processes of design and technology
- dissemination of ideas from the courses and support provided in school for this
- the effect of the course on the whole school.

An initial questionnaire was drawn up and trialled with four teachers, each of whom had attended one of the earlier four courses. This was followed up with individual interviews to gather information on any changes that were necessary to the questions and to the format of the questionnaire. The final questionnaire was then distributed to all course members and their headteachers as part of Survey I. Survey II was conducted one year later using the same questionnaire.

The survey technique had a number of limitations which should be borne in mind when examining the data. These included:

- respondents had a personal interest in indicating a significant degree of change since they were the main agents of such change
- the degree of change in understanding, attitude and approach to a curriculum

Table 1: Survey of course members' perceptions of the long term effectiveness of their course

Results show the total number of responses to each grade for survey I and survey II and a total.

knowledge and understanding of: (omit aspects not covered on your course)	FOR YOURSELF					FOR SOME COLLEAGUES					FOR THE WHOLE STAFF				
	changed a lot-----no change					changed a lot-----no change					changed a lot-----no change				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
structures and forces															
SURVEY I	5	10	8	1	1	1	4	12	3	1	0	0	10	9	3
SURVEY II	6	9	7	8	0	4	9	5	5	2	0	6	16	5	2
TOTAL	11	19	15	9	1	5	13	17	8	3	0	6	26	13	5
electricity in D&T															
SURVEY I	5	8	8	0	2	0	4	10	6	1	0	0	9	7	5
SURVEY II	4	7	15	2	2	2	7	12	3	2	0	2	15	6	4
TOTAL	9	15	23	2	4	2	11	22	9	3	0	2	24	13	9
mechanisms															
SURVEY I	9	7	8	0	1	0	8	7	2	2	0	3	5	7	6
SURVEY II	13	12	4	0	0	2	12	9	3	2	0	10	9	8	2
TOTAL	22	19	12	0	1	2	20	16	5	4	0	13	14	15	8
control															
SURVEY I	4	7	8	3	0	1	3	4	3	5	0	2	3	7	8
SURVEY II	6	14	7	2	1	2	6	8	4	8	0	4	10	5	10
TOTAL	10	21	15	5	1	3	9	12	7	13	0	6	13	12	18
energy															
SURVEY I	0	7	10	2	1	0	3	3	7	4	0	2	3	5	8
SURVEY II	0	9	11	3	1	0	7	11	6	4	0	1	2	7	9
TOTAL	0	16	21	5	2	0	10	14	13	8	0	3	5	12	17
food															
SURVEY I	5	7	3	5	3	3	7	2	1	5	1	7	1	3	8
SURVEY II	11	11	7	1	0	5	11	11	0	2	2	7	10	4	6
TOTAL	16	18	10	6	3	8	18	13	1	7	3	14	11	7	14
textiles															
SURVEY I	2	6	6	4	2	1	4	4	2	5	0	3	3	6	8
SURVEY II	7	14	6	2	1	2	16	11	0	0	2	8	5	12	2
TOTAL	9	20	12	6	3	3	20	15	2	5	2	11	8	18	10
practical capability ie ability to use tools and materials and the processes associated with these															
SURVEY I	5	5	7	2	5	0	2	9	5	3	0	0	8	8	5
SURVEY II	8	18	7	0	0	8	9	8	4	0	2	9	12	4	2
TOTAL	13	23	14	2	5	8	11	17	9	3	2	9	20	12	7
understanding of the processes of designing and making															
SURVEY I	9	10	4	2	0	2	7	7	4	0	1	6	8	5	2
SURVEY II	11	13	4	2	0	10	12	5	0	2	4	13	9	2	2
TOTAL	20	23	8	4	0	22	19	12	4	2	5	19	17	7	4
ability to plan, implement and assess D&T in the classroom															
SURVEY I	6	14	2	3	0	1	5	8	5	1	1	5	7	8	3
SURVEY II	4	20	5	0	0	7	10	6	0	2	0	10	13	4	2
TOTAL	10	34	7	3	0	8	15	14	5	3	1	15	20	12	5

area was measured subjectively through the views of a single person

- some changes in schools would have happened without the influence of the in-service course.

Survey data

The following sets of data show the results for two surveys, carried out at different times, but employing the same questionnaire. Survey I took place in 1996 and focused on a range of courses which took place in 1993, 1994 and 1995. There were 25 respondents out of a potential 71 course members. Survey II was conducted in 1997 and concerned courses run in 1996 and received 30 respondents out of a potential 42 course members. In each case the replies for all the courses run by the two universities were combined for the period in question.

The results for both surveys are presented in Tables 1 and 2 in the format of the questionnaire for convenience and for ease of analysis.

Analysis

The results can be examined from two standpoints. A commentary can be made on the overall results for courses run in the last 4 years by taking the total results for each question. At the same time a comparison is possible between courses run between 1993 and 1995 and the ones run more recently in 1996. Thus an indication of the change in the effect of similar courses over time can be explored.

The nature of the individual courses was different in that they were run at different establishments and for different Education Authorities. Furthermore the duration of the courses varied from 6 days to 20 days. The results, therefore represent a wide variety of provision and should be examined with this in mind. General trends will be highlighted rather than focusing on specific results.

Where the perceived degree of change is shown to be small or of no significance this may be for one of a number of reasons. It is possible that the previous experience and knowledge of the participant was already at

a high level in that area before attending the course and therefore little change would be possible. Alternatively it may be that the presentation and content of that aspect of the course did not meet individuals' needs. Other possible reasons for little or no change may be lack of the right conditions in the school to foster and promote change, the course participant's own resistance to change or a respondent's modest attitude to his or her achievements since the course.

Knowledge and understanding of design and technology

This section of the questionnaire focused on an understanding of the content and procedures in the subject as well as an ability to plan and implement successfully. The combined results for Surveys I and II show a clear increase in confidence in participants' ability to plan and implement design and technology in the classroom. Eighty-one percent of respondents felt they had made significant changes in this area.

A similarly large proportion of course members (78%) felt they, personally, had made improvements in their understanding of the processes of designing and making. Since this is fundamental to understanding the nature of the subject and a significant feature of each course, this was a reassuring result.

The area of content knowledge and understanding showing the greatest increase in confidence was that of mechanisms, where just over three quarters of course members indicated significant change. Generally all areas in this section appeared to have made an impact on the understanding of course participants with the exception of Energy and perhaps Electricity. This can be explained by the low profile given to these areas on the courses and also indicates how the survey sheet might be rationalised for future use in order to reflect current changes in course design.

Effects on colleagues in schools

The degree to which colleagues in schools had changed their understanding was clearly perceived to be less than for course members, for each survey question. A clear picture of the cascade effect of course dissemination emerges in the results. In

Table 2: Survey of course members' perceptions of the long term effectiveness of their course

Results show numbers of respondents in each case.

The long-term effects on schools and staff of in-service courses for teachers of primary design and technology

QUESTION 3. How were the ideas gained on the course disseminated to colleagues? (tick all methods you have used)

	SURVEY I	SURVEY II	TOTAL
not at all	0	0	0
informal discussions	21	28	49
after school staff meetings	19	23	42
teacher group meetings (ie year group or cross phase)	13	17	30
1/2 day training day	3	3	6
full day training day	4	12	16
written materials	21	24	45
teaching alongside colleagues	8	9	17
observing colleagues as they teach	4	6	10
discussions with headteacher	15	18	33

QUESTION 4. Have you been able to write a school policy for D&T or extend a previously written one since your course? Please ring.

	completed policy	partially completed policy	no policy yet
SURVEY I	15	5	3
SURVEY II	25	3	0
TOTAL	40	8	3

QUESTION 5. Have you been able to complete a scheme for D&T for the whole school since the course? Please ring.

	complete scheme	partially completed scheme	no scheme yet
SURVEY I	10	8	7
SURVEY II	17	8	4
TOTAL	27	16	11

QUESTION 6. Was D&T part of a school development plan before the course?

	YES	NO
SURVEY I	19	6
SURVEY II	16	11
TOTAL	35	17

Has D&T been part of a school development plan since the course?

	YES	NO
SURVEY I	15	6
SURVEY II	23	6
TOTAL	38	12

QUESTION 7. Have extra funds been allocated to D&T as a result of the course? Please ring.

	YES	NO	DON'T KNOW
SURVEY I	8	16	0
SURVEY II	22	7	0
TOTAL	30	23	0

QUESTION 8. Have you been provided with increased non-contact time since the course in order to promote D&T?

	YES	NO
SURVEY I	8	16
SURVEY II	7	21
TOTAL	15	37

QUESTION 10. Did you receive support from others outside your school for promoting D&T after the course?

	YES	NO
SURVEY I	13	9
SURVEY II	11	16
TOTAL	24	25

QUESTION 12. Do you feel the course changed your role as a coordinator for design and technology?

	a lot -----not at all				
	1	2	3	4	5
SURVEY I	3	3	5	0	1
SURVEY II	4	17	7	1	0
TOTAL	7	20	12	1	1

QUESTION 13. To what degree do you think your headteacher has been influenced regarding the teaching of D&T in the school since the course?

	a lot -----not at all				
	1	2	3	4	5
SURVEY I	0	4	8	2	9
SURVEY II	4	10	9	3	2
TOTAL	4	14	17	5	11

QUESTION 14. How strong was Design and Technology in your school before your course?

	strong -----weak				
	1	2	3	4	5
SURVEY I	0	0	4	5	3
SURVEY II	2	5	8	15	

QUESTION 15. How strong is Design and Technology in your school now?

	strong -----weak				
	1	2	3	4	5
SURVEY I	0	4	6	1	1
SURVEY II	3	13	12	2	0

Table 2: Survey of course members' perceptions of the long term effectiveness of their course (continued)

Results show numbers of respondents in each case

most instances it appears that a few close colleagues have been influenced by the dissemination of ideas from the courses but that this effect diminishes when all the staff are considered. In some of the more problematic areas such as control technology as many as 61% of respondents felt that little or no change had occurred for the whole staff in their schools.

In contrast to this, more than half of respondents felt that the whole staff had made a moderate improvement in their understanding of mechanisms and food. An even greater effect can be detected in whole staff understanding of planning and implementation in the subject (66% achieved a moderate to significant change) and in the fundamental appreciation of the processes of design and technology (79% achieving a moderate to significant change). Staff expertise in practical capability also showed a significant improvement.

It can be assumed that some time has been spent by course members on running in-service sessions in their own schools after the completion of the course. One might expect these in-service sessions to focus on a general introduction to the essential features of design and technology. If such an introduction includes work on an understanding of the nature of design and technology, practical capability and classroom planning then the survey results signal the impact of such dissemination.

Improvements in the results for survey II

In practically all areas of knowledge and understanding a clear improvement can be detected in the results for Survey II compared with those for the first survey. Most significantly, a strong improvement can be detected in course members' practical capability (42% to 77%), their understanding of mechanisms (64% to 86%) and in the areas of food and textiles. A similar trend can be found for some colleagues and whole staff understanding in these areas.

These encouraging improvements will almost certainly be for a variety of reasons. Course design and delivery will have improved as more experience is gained by the providers and in the light of previous

course evaluations. A clearer understanding of what design and technology is and its potential for learning in the primary school has emerged in the years since the first implementation of the subject in 1990. A rewritten National Curriculum for design and technology was introduced into schools in September 1995 and will have had an influence on the courses evaluated in Survey II. New publications from subject associations such as the Design and Technology Association (DATA) as well as recent research has increased the learning curve for all involved in the development of the subject.

Dissemination of ideas gained on the course

The responses to Question 3 (Table 2) indicate the methods by which course members disseminated ideas gained on their course to their colleagues in schools. The results are very similar in both surveys apart from a marked increase in the use of a full training day for in-service provision. Only 4 respondents had indicated this method in Survey I but this had increased to 12 in Survey II. Quite possibly there is a link between this increase in the use of a full day's training and the increase in confidence noted earlier in staff in certain fundamental areas of the subject. However, this strategy was only used by a total of 29% of all course members. This figure rises to 40% when the results for the use of a half day's training are included. It would seem that the best potential for disseminating the ideas on a recent in-service course is not being exploited by more than half of schools surveyed. When the cost of such courses and the possible disruption to the school is considered it is disappointing that a simple means of passing on ideas is not being used to the fullest extent.

Other methods for dissemination were used by larger proportions of course members: 89% of respondents used informal discussion and 82% employed written materials; 76% were able to convey ideas in after school meetings and a welcome 60% were involved in discussions with their headteacher. The most time consuming and yet effective option, teaching alongside colleagues, was employed by just under a third of respondents.

Support for course members by their school and external agencies

Questions relating to funding for resources and attitudes of heads enabled information to be gathered in relation to the support of the participants by their schools. From both surveys it was evident that more funding had been made available to coordinators in schools as a result of the attendance on the course (57%) but there were still a significant number of participants (43%) who indicated that they had not been allocated extra funding. However, comparison between the two surveys shows that 76% from the later survey received extra funds compared with 33% from the first survey. This increase in extra funding over the last three years is in line with the national trends shown in the *DATA Survey of Design and Technology in Schools* (DATA, 1995).

The increase could be explained in several ways. The subject has become firmly rooted in the primary curriculum and its importance is understood by more headteachers there is a greater understanding by coordinators of what is needed: the recognition that to produce quality products appropriate resources are needed; there has been a growth in appropriate, accessible, attractive resources; following an inspection, design and technology has been identified as a priority subject in action plans, thus ensuring the allocation of more funding; and as other subjects were resourced first it is now the turn of design and technology. Certainly 76% of respondents identified design and technology as being part of their schools' development plan since attendance at the course. Whilst respondents were not required to identify how the extra funding had been spent, it was interesting to note that a number identified that the additional funding had been spent on construction kits. In the National Curriculum (1996), the use of construction kits was included in the programmes of study; thus schools have to ensure that they have them. In addition, on all courses the appropriate uses and evaluation of construction kits are highlighted, thus raising the awareness of the coordinators as to their importance.

The significance of the headteacher in promoting change within schools

The importance of the headteacher in bringing about successful curriculum change has been shown in research carried out by Harland and Kinder (1992) and in the *DATA* survey (1995). It has been found that without such support it was difficult for coordinators to develop the subject in a positive way throughout the school. With regard to the GEST funded courses, more than two thirds of the respondents indicated that heads had given at least moderate support but that a significant minority (22%) had given no support at all. This would suggest that some of the changes that have taken place in schools have occurred despite there being little active encouragement from some headteachers.

However, when comparisons are made between the two surveys, it is encouraging to note that heads have been much more supportive in the later survey with 82% of heads being at least moderately supportive, and often very supportive, whilst only 7% were not at all supportive. A small number of respondents made positive comments regarding the commitment that the head has shown to design and technology. Possible reasons for this change are varied. Heads may now have a better understanding of design and technology and realise the value of it in relation to the education of the primary child. School inspections often have highlighted the need to include the development of design and technology in the school's action plan although indications from the *DATA* survey would suggest that whilst this was the case only 42% of schools took action as a result of the inspection. Nevertheless, action may have been taken before the inspection. Over the two surveys there has been a small increase of 8% relating to the inclusion of design and technology in school development plans. Heads now have highlighted design and technology as a priority before the course and want to ensure that the course has maximum positive impact on the school.

Overall effect of the course on the school

Course participants were asked about the inclusion of the subject in the school development plan, the production of a school policy, schemes of work for the

whole school, the role of the coordinator and the strength of design and technology in the school both before and after the course.

A number of LEAs had selected participants to the courses on the basis that design and technology was part of the school development plan. The results for the earlier courses show this was the case when 76% of respondents answered positively (Question 6). This figure fell to 59% for the later courses, perhaps indicating that this was not such a strong requirement once the subject had undergone a degree of development in schools. However, since the attendance on the course 71% in the first survey and 79% in the second indicated that it had become part of the school development plan. By prioritising design and technology in schools in this way (alongside course attendance by a member of staff) there is more likelihood that it will develop successfully in the schools.

The production of a policy is regarded as a strong basis for any curriculum development in a school and should be the underpinning for the delivery of the subject. It should state clearly the rationale for the subject the aims and objectives for that school together with an outline of how the implementation of design and technology is to be carried out. Overall 78% of participants had written a policy since attending a course, 16% had a partially completed one, whilst 6% had no policy yet. From a comparison with the two sets of data, it is apparent that there has been an increase in those producing policies from the later courses with all participants indicating that they have at least a partially completed policy. Perhaps this is not surprising as it is the starting point, more schools are preparing for inspection, design and technology is more firmly rooted in the curriculum and most schools have identified a coordinator within the school with responsibility for its production.

A similar trend was found for schemes of work. Whilst overall 80% of participants had at least a partially completed scheme of work, 72% on the earlier courses but 86% on the later courses achieved this. A scheme of work provides all teachers in a school with a structured programme of work which builds on previous skills and

knowledge and understanding. Without this, there is little chance that the work provided for the children will be relevant and balanced and allow for continuity and progression.

Again the increase in the production of these schemes from later courses may well be the result of a longer period of time since the introduction of design and technology into the curriculum in which to develop the schemes, the growing confidence and understanding of the coordinator to produce the schemes and the need to have schemes in place for inspection of schools. There were two comments about policy and schemes being deemed sound by inspectors from the Office for Standards in Education (Ofsted).

The participants were asked to indicate how much the course has changed their role as a coordinator for design and technology within their school. Both surveys showed that there was a positive change with no negative comments being made. However, there was marked increase in the later courses with 72% of coordinators in comparison to 50% indicating that there were positive changes. Comments included: 'I gained confidence', 'I now have a greater knowledge', 'I am more confident in my ability to monitor' and 'I have increased personal skills'.

Finally the participants on the courses were asked to consider the strength of design and technology in their schools both before and a year after attendance on the course (See Table 2, Questions 14 and 15). It is not surprising given all the other responses that overall, design and technology was stronger in schools after the course. However, it is interesting to note that from the second survey, design and technology was considered to be weak in the schools before the course by 52% of the participants in comparison with 25% on the earlier courses. Of course, these data are based on the perceptions of the participants and this will be subjective, but it could be that the first survey included schools who had already made a start and that by the time of the second survey, participants were coming from schools who had initially ignored the development of design and technology and

now were coming as a result of inspection or impending inspection. This information was not gathered from the surveys but will be included in any further questionnaires.

Conclusions

The majority of respondents indicate a significant change in their understanding of the key aspects of design and technology as a result of the course. This is especially true in the fundamental areas of the subject such as an understanding of the nature of design and technology and practical capability.

Course members indicated that there had been varying degrees of positive change within their schools since the completion of the course.

There were marked, positive increases between the results for Survey I and Survey II which suggests that there is a growing confidence and improvement in understanding of the subject by all concerned.

Whilst there is evidence of additional funding being given to support the dissemination of the ideas gained on the course and from the findings of the second survey, more participants were given this funding, there are still 32% of participants who indicated that funds have not been increased and comments were made about the difficulties of implementing change in school without this additional funding.

Course members used a variety of strategies for disseminating ideas gained on the courses and there is evidence of an increase in the use of full training days for this purpose. There is, however, a significant proportion of course members who have not been able to influence staff in their schools through formal INSET provision.

Two thirds of course respondents have been unable to disseminate their ideas by teaching alongside staff in their schools.

Both surveys suggest that there is a need for more heads to become positively influenced by the courses their staff attend.

The situation had improved since the first survey but there was still a significant overall minority of heads (21%) who hardly gave any support once the participant had returned to school.

Whilst there is evidence that policy and schemes of work are in place in majority of the schools after the course, there is still a need to ensure that all the course participants develop appropriate documentation to support the successful delivery of design and technology.

Recommendations

The following are recommendations for the implementation of in-service provision for primary teachers together with action which might be taken by schools during and on completion of the course:

- Headteachers, in their role as curriculum leaders and resource managers, should be made more aware of the course content and how they might support changes within their school. One way in which this might be achieved is to involve them in initial and after course meetings.
- Adequate resources such as time and funding should be made available to promote the subject, especially in the first wave of enthusiasm following attendance at a course.
- Teachers should return from the courses having formulated an action plan for design and technology in conjunction with their headteacher which takes into account the school development plan.
- More thought should be put into how a course member will disseminate ideas after the completion of the course. A variety of strategies should be employed including long in-service sessions and informal meetings. All courses should include help on dissemination strategies.
- School monitoring systems should include an evaluation of the long term impact of long award bearing courses on classroom practice in design and technology.

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