


This item was submitted to Loughborough's Institutional Repository by the author and is made available under the following Creative Commons Licence conditions.




creative commons  
COMMONS DEED


**Attribution-NonCommercial-NoDerivs 2.5**


**You are free:**

- to copy, distribute, display, and perform the work

**Under the following conditions:**

 **Attribution.** You must attribute the work in the manner specified by the author or licensor.


 **Noncommercial.** You may not use this work for commercial purposes.

 **No Derivative Works.** You may not alter, transform, or build upon this work.

- For any reuse or distribution, you must make clear to others the license terms of this work.
- Any of these conditions can be waived if you get permission from the copyright holder.

**Your fair use and other rights are in no way affected by the above.**

This is a human-readable summary of the [Legal Code \(the full license\)](#).

[Disclaimer](#) 

For the full text of this licence, please go to:  
<http://creativecommons.org/licenses/by-nc-nd/2.5/>

# Inservice training for primary design and technology - is it working?

Clare Benson\*, Rob Johnsey+ and Diane Wiggins\*  
University of Central England\* and Warwick University+

## Abstract

*This paper reports on course participants' perceptions of aspects of change in their schools as a result of participation in Grant for Education and Training (GEST) funded courses for design and technology, carried out at the Universities of Central England and Warwick.*

*An initial trial, using both questionnaire and interview techniques, was followed by a questionnaire survey of teachers who had attended the courses during 1993 and 1994.*

*The categories of enquiry focused on the perceptions of changes in the practice of the course participants, their colleagues and the school as a whole. Additional enquiry was made into changes in resourcing for design and technology following the course, the attitude of the head teacher towards design and technology and the provision made for dissemination of the courses in schools.*

*Analysis of the data has made possible a comparison of the effects of course length, structure and focus on the perceptions of changes to design and technology practice in the schools surveyed. Patterns in responses are identified and analysed, and recommendations for future courses are suggested.*

## 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 science, art and craft together with a range of related subjects, design and technology was a new, single subject. It soon became apparent that the nature of the subject needed further understanding before it could be taught effectively in schools. GEST funded courses for primary co-ordinators of design and technology began in England in 1993. Initially the courses were for twenty days duration but since 1994 they have varied in length from five days to the original twenty days. Whilst a comprehensive evaluation of the first courses of a similar nature in mathematics and science was carried out in 1992 (Harland and Kinder 1992) 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 four GEST funded courses held at the University of Central

England and Warwick University during the academic years 1993/4, 1994/5. The intention was to survey the course members' perceptions of the long term effectiveness of each course. Rather than try to measure this in absolute terms, it was decided to gauge the perceived change that different aspects of each course had made to three groups of people - the course members, colleagues in their schools and the whole school staff.

## Brief description of the four courses

The courses at both Universities had a common core of key elements which had been identified by the Department for Education (DFE) as a requirement for validation and were planned jointly with the Universities and the Local Education Authorities (LEA). The common elements included the development of teachers' own knowledge and understanding of design and technology, their ability to plan and implement design and technology in their schools and the exploration of issues relating to the role of the primary school co-ordinator for design and technology. However, differences between the

Course aspect	UCE 16 day	Warwick 20 day	Warwick 6 day
Knowledge, understanding and practical capability of :-			
structures and forces	5 hours	6 hours	3 hours
electricity in D & T	5 hours	3 hours	1.5 hours
mechanisms	10 hours	6 hours	3 hours
I.T applications including control	4 hours	3 hours	-
food	5 hours	6 hours	-
textiles	5 hours	6 hours	-
paper, card and reclaimed materials	5 hours	-	-
understanding of the processes of designing & making	10 hours	18 hours	7.5 hours
planning, implementing and assessing D & T	10 hours	21 hours	9 hours
working with children in schools	-	9 hours	3 hours
Values in Design and Technology	1.5 hours	1.5 hours	-
Visit to DATA at Wellesbourne	-	3 hours	-
Major making project	15 hours	-	-

Figure 1 Content of GEST funded courses at UCE and Warwick University

courses were noted. At Warwick University a greater emphasis was placed on enhancing teachers' understanding of the nature of design and technology and exploring the inherent processes through work with children, whilst at the University of Central England a greater emphasis was placed on enhancing subject knowledge and practical capability. (see figure 1)

### Survey rationale

It is important to be clear about the intentions of the survey and to recognise its limitations. The main aim of the survey 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. 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.

### Methodology

The survey was 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 four main areas of interest.

- Teachers' subject knowledge and understanding of the processes of design and technology
- The parts of the courses which had significant effects on the participants
- Dissemination of ideas from the courses and support provided in school for design and technology.
- 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 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 head teachers.

Out of a potential seventy one course members, there were twenty five respondents, split almost equally between those attending courses in each of the two universities. Respondents did not answer all the questions since, in some instances, these were not all relevant to their particular course. It was noticed, in a significant number of cases, that the distribution of responses for the participants at both universities was similar so

it was decided to combine both sets of results and focus on the general patterns which emerged from these.

The survey technique had a number of limitations. 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 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.

It is impossible to separate all such influences.

### Survey results and analysis

#### *Teachers' background knowledge and understanding in design and technology*

A general trend in this section was for a significant increase in knowledge and understanding to be indicated for the course members but a lesser change for some of their colleagues in school. An even smaller change was recorded in every case for the whole staff in the school. Mechanisms is just one example of this trend (see figure 2. P) However Computer Control was one area where the consensus was not so great and this may have been because Control as a distinct area did not feature so strongly on each of the four courses.

If the results are compared for all the subject knowledge areas then course members felt that they had improved their understanding of Mechanisms the most, followed closely by Structures. The least change for the course members was indicated in Textiles and Food Technology. A similar pattern was noticed for some colleagues in schools. This trend may have been because of a general emphasis within the courses on subject knowledge which is less familiar to primary school teachers such as those associated with the physical sciences. Indeed, the specifications set out by the DFE included mention of Structures and Mechanisms whilst not requesting work in textiles and food directly. A pre course audit at the University of Central England found that prospective course

Figure 2 GEST funded courses in primary design and technology

**Survey of course members' perceptions of the long term effectiveness of their course**

2. In your opinion how do you feel the course and the subsequent time in school has changed the following:

Ring one number in each column

	FOR YOURSELF	FOR SOME COLLEAGUES	FOR THE WHOLE STAFF
	changed a lot— ————no change	changed a lot— ————no change	changed a lot— ————no change
knowledge and understanding of: (omit aspects not covered on your course)			
structures and forces	1 2 3 4 5 <b>5 10 8 1 1</b>	1 2 3 4 5 <b>1 4 12 3 1</b>	1 2 3 4 5 <b>0 0 10 9 3</b>
electricity in D&T	1 2 3 4 5 <b>5 8 8 0 2</b>	1 2 3 4 5 <b>0 4 10 6 1</b>	1 2 3 4 5 <b>0 3 5 7 6</b>
mechanisms	1 2 3 4 5 <b>9 7 8 0 1</b>	1 2 3 4 5 <b>0 8 7 2 2</b>	1 2 3 4 5 <b>0 3 5 7 6</b>
control	1 2 3 4 5 <b>4 7 8 3 0</b>	1 2 3 4 5 <b>1 3 4 3 5</b>	1 2 3 4 5 <b>0 2 3 7 8</b>
energy	1 2 3 4 5 <b>0 7 10 2 1</b>	1 2 3 4 5 <b>0 3 3 7 4</b>	1 2 3 4 5 <b>0 2 3 5 8</b>
food	1 2 3 4 5 <b>5 7 3 5 3</b>	1 2 3 4 5 <b>3 7 2 1 5</b>	1 2 3 4 5 <b>1 7 1 3 8</b>
textiles	1 2 3 4 5 <b>2 6 6 4 2</b>	1 2 3 4 5 <b>1 4 4 2 5</b>	1 2 3 4 5 <b>0 3 3 6 8</b>
practical capability ie ability to use tools and materials and the processes associated with these	1 2 3 4 5 <b>5 5 7 2 5</b>	1 2 3 4 5 <b>0 2 9 5 3</b>	1 2 3 4 5 <b>0 0 8 8 5</b>
understanding of the processes of designing and making	1 2 3 4 5 <b>9 10 4 2 0</b>	1 2 3 4 5 <b>2 7 7 4 0</b>	1 2 3 4 5 <b>1 6 8 5 2</b>
ability to plan, implement and assess D&T in the classroom	1 2 3 4 5 <b>6 14 2 3 0</b>	1 2 3 4 5 <b>1 5 8 5 1</b>	1 2 3 4 5 <b>1 5 7 8 3</b>

Results for each question are in bold.

members felt that they had a degree of confidence in Textiles and Food, thus supporting the theory that less change might be expected in this area.

The responses to the question about practical capability - an ability to handle tools and materials - showed an apparent lack of confidence in some respondents. Twenty nine per cent felt that there had been little or no change in this area, while the same percentage felt that a moderate change had occurred. This may have been because they already possessed a degree of capability or they did not recognise the need to achieve a practical capability themselves. However the pre course audit would not support these ideas. It is more likely that a practical ability is not easily gained on a relatively short course where there are a number of differing objectives.

The greatest change, overall, was reserved for understanding of the processes of designing and making. Here 76% of respondents indicated that they had gained increased understanding. Moreover, the results show that much of this understanding had been passed on to colleagues in school. Such increases in a fundamental understanding of the subject indicates how relatively new these ideas are to most primary teachers and how much still may have to be done to increase an overall understanding in all schools in England.

#### *The most significant effects of elements of the courses on schools*

It is worth noting that during the year between the last course and the survey, the National Curriculum for design and technology was radically changed. Despite these changes, 22 schools had a policy for design and technology by the time of the survey and 18 schools had completed schemes of work.

Course members were asked to identify three key aspects of the courses which they felt had made the most significant impact on the teaching of design and technology in their schools. There was a significant difference in the responses from teachers on the courses at the two institutions. At UCE, over 70% of teachers identified knowledge and understanding (particularly in the areas of Textiles, Food and Mechanisms) linked to

practical capability, as having had the most influence, whilst at Warwick University the pattern was very different. The responses here showed that there was no one aspect which had had a major influence, rather a wide variety of aspects were cited as each having influenced a small percentage of the teachers. This pattern could be explained by the differing nature of the courses, as described earlier. However, although Food and Textiles were the most frequently mentioned aspects in this part of the survey, they were not identified as having brought about a significant change in the knowledge and understanding of the teachers. It could be that what the teachers had gained were ideas for practical implementation, and the 'feel good' factor of the day may have remained with them, making it difficult to distinguish between personal enjoyment and influence on teaching.

Although Structures and Forces were identified as areas in which teachers' own knowledge and understanding had increased the most, these aspects were not identified as having had a great influence on teaching throughout the school.

This may be because teachers found difficulties in translating the concepts gained on the course into activities across the primary age range.

#### *Dissemination of ideas from the courses and support provided in school for design and technology*

Teachers were asked how ideas gained on the courses had been disseminated within their own school. The data revealed that informal discussion played the largest role, with almost all teachers having also been involved in after-school meetings. Relatively few course members had been able to share ideas through subsequent in-school training days. As schools have only five such days each year and design and technology is not a core curriculum subject this is perhaps not surprising. Only one third of teachers reported having had non-contact time for developing design and technology within their school. Where this had been available, either on a regular basis or as several whole days, it had been spent on a variety of tasks including writing schemes of work and meeting colleagues. Almost all

teachers had used written materials to pass on ideas to colleagues and about one third had worked alongside other teachers in their classrooms (see figure 3). One teacher commented that although time for formal dissemination was limited, she felt ideas had been transmitted indirectly through writing the school policy.

Funding for design and technology has been shown to vary across the country (DATA, 1995) and our survey showed that only one third of schools had allocated extra funds to design and technology as a result of the course. Some teachers reported other spending priorities, such as information technology, or that each curriculum area is part of a rota for focused funding and was not a priority during that year.

*Overview of the effects of the course on the profile of design and technology in the schools*  
Information was gathered relating to the place of design and technology in the school development plan, including the production

of a school policy and schemes of work for design and technology. An analysis of the survey responses shows that overall, participation in the courses had had a positive effect on schools, although this had not been uniform. There were marked differences between the courses at the two institutions in terms of the degree to which the head teacher had been influenced with regard to the teaching of design and technology. Whilst on the Warwick course it was felt that 70% of head teachers had been influenced a lot or quite a lot by the course, only 43% of teachers on the courses at UCE identified that the head teachers had been significantly influenced since the course. On the Warwick courses, unlike UCE, the LEA had provided the head teachers with more opportunities to be involved at key times during the courses. They attended an initial meeting to discuss the nature of the course and the intended outcomes, and visits were made to some of the schools during the courses. Most significantly, the head teachers attended the

### Survey of course members' perceptions of the long term effectiveness of their course

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

not at all	<b>0</b>
informal discussions	<b>21</b>
after school staff meetings	<b>19</b>
teacher group meetings (ie year group or cross phase)	<b>13</b>
1/2 day training day	<b>3</b>
full day training day	<b>4</b>
written materials	<b>21</b>
teaching alongside colleagues	<b>8</b>
observing colleagues as they teach	<b>4</b>
discussions with headteacher	<b>15</b>
other:	

Figure 3 GEST funded courses in primary design and technology  
Results in bold

final session of each course in order to discuss the needs of their school with the course member and to agree an action plan for the future.

### Conclusions

The main conclusions drawn from the results of the survey are :

- Teachers' own subject knowledge and understanding in the key areas common to all courses had significantly increased.
- One area of greatest improvement as a result of the courses was in teachers' understanding of the processes of designing and making, thus indicating a probable lack of clear understanding before the courses. This may have been due in part to the many changes which had taken place to the National Curriculum for design and technology and the small numbers of teachers who have studied the subject during their own schooling.
- The relative success of the 'cascade effect' whereby course members are expected to pass on the skills, knowledge and understanding gained on such courses to their colleagues in schools can be measured to some degree. Whilst there is some evidence of success for some colleagues in certain aspects, the effect appears to diminish markedly when the school as a whole is considered.
- Time and additional funds to support the dissemination of ideas gained on the course are not always made available to returning course members.
- Dissemination of ideas takes place largely through informal conversations, staff meetings and written materials. Formal follow-up is limited.
- There is room for improvement in the way head teachers are positively influenced by the courses their staff attend. The link between the course aims, head teachers' involvement and their perceptions of design and technology is important.

### Recommendations

From the findings and conclusions above, it would appear that the course content (even on the shorter courses) provided an appropriate balance between understanding of the processes of design and technology and supporting subject knowledge and understanding for teachers. This balance would need to be maintained on future courses. However, changes do need to be made to the ways in which the content of the courses is disseminated. This view is supported by the recent report by Her Majesty's Inspectors (1996) relating to inservice training.

The authors would recommend the following as being important considerations if courses in design and technology are to bring about changes in schools :

- Head teachers, 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.
- If new ideas from a course are to be disseminated effectively then a temporary boost to funding would seem advantageous, as a time lag in the availability of resources to implement new ideas might mean they are not taken up once initial enthusiasm has waned.
- Course providers should include, as part of the course, ways in which course participants might disseminate skills, knowledge and understanding to colleagues when they return to school.
- Teachers should return from the courses having formulated an action plan for design and technology, in conjunction with their head teacher, which takes into account the school development plan.
- School monitoring systems should include an evaluation of the long-term impact of such courses on classroom practice in design and technology.



## References

- Design and Technology Association. *A survey of capitation allowances, resources and INSET needs for design and technology in primary and secondary schools in 1994/5*, DATA research paper No. 3, 1995, DATA.
- Harland, J. and Kinder, K. *Mathematics and science courses for primary teachers: lessons for the future*. 1992, National Foundation for Educational Research.
- *Report from the Office for Her Majesty's Inspectors of Schools Subjects and standards-issues for school development arising from OfSTED inspection findings 1994-5 Key Stage 1 and 2*, 1996, HMSO.