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## **Managing the delivery of design and technology in secondary schools**

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REPOSITORY RECORD

Davies, Trevor. 2019. "Managing the Delivery of Design and Technology in Secondary Schools". figshare.  
<https://hdl.handle.net/2134/1645>.

## MANAGING THE DELIVERY OF DESIGN AND TECHNOLOGY IN SECONDARY SCHOOLS

**Davies T C**

Six Counties Technology Project

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Technology has always been the Cinderella of the education system, partly because of the power and mysticism bound up with the term by society, and partly because of the high value placed on theoretical knowledge and on the ability of children to remember facts and regurgitate them in however many ways teachers can devise.

Technological activities in the traditional sense, as recognised by those outside CDT or science departments, have tended to be bound up in the notion of wood-work, metal-work or more recently IT. Preferably situated furthest away from the Headmaster's room and serving the needs of less to average ability pupils. A slightly more acceptable face to technology has been that controlled by physics departments in schools, where even if the lights did flash in the house that a child had constructed, the cardboard houses were so poorly designed and built that it was quickly destined for the waste bin because the outcome held little or no value for the child. Even with the advent of Craft Design and Technology, names of departments in some schools changed, but the old skills associated with using and manipulating materials, still made up the large core of what went under the name. This was very much highlighted by the Secondary Schools curriculum review conducted by H.M.I.

Computer studies courses have of course flourished recently in many schools - as the sole preserve of the expert from 'maths' or sometimes 'science' who flaunted his language in a manner that deserved a key role in Hamlet.

The Government initiative in reporting Technology as the 1st of the non-core foundation subjects associated with the National Curriculum, has begun to focus the thinking of managers and administrators in schools and LEA's. It has set an agenda for the decade in its far reaching implications. Development at LEA, school, faculty and department level needs to be structured in a way that takes real time into consideration, not to try to change everything in one breath as it were.

The philosophy of the approach determined by the National Curriculum Working Party for Technology, under the chairmanship of Lady Parkes, clearly offers a bench-mark for the delivery of the statutory orders. Secondary schools are organised to deliver a subject based, knowledge led curriculum. There are therefore fundamental implications for the co-ordination and management of design and technology if the delivery is to become genuinely integrated in respect of those teaching it and in particular, how children receive it.

Teachers of the five identified subjects of design and technology need to increasingly look for ways, in which their subject can contribute positively and from strengths. This will take time to develop. Teachers of other subject areas, particularly science, mathematics, and english need to recognise the contributions that they have to make to design and technology. For this to happen effectively, the process of change in schools must be controlled and managed with clear targets and timescale for development.

Great opportunities for learning are presented by collaborative work. Each area may contribute appropriately from its resources and expertise, to enable children to reach higher standards and better quality outcomes.

Design and Technology is not a traditional subject area of the curriculum, with a recognised culture and discipline such as Science and Mathematics. Its development within schools, will need to be undertaken with tact and careful consideration of managers, teachers, pupils, parents and governors values.

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The Six Counties Technology Project is one of ten Joint Support Activities Nationally and has been running since April 1988, obviously before the reporting of the National Curriculum Working Party for Technology.

The project aim was:

'To identify and produce a network structure which can enable curriculum strategies to be developed and will offer training opportunities which will promote the delivery of the technological dimensions of the 14-19 curriculum.'

Thirteen pilot schools/colleges from across the six LEA's have been involved at the heart of the project, where the emphasis has been on the adoption of 'a whole institution' approach to delivering technology. These institutions were not chosen as a result of prior identified excellence in respect of technology but rather to represent a wide range of social and academic cultures and pupil ranges.

Detailed project outcomes are being published in two phases. National Curriculum requirements for technology have highlighted the importance of much of the work undertaken in pilot institutions, e.g. in co-ordination, team building, developing curriculum models, reviewing, profiling etc.. Development work has been undertaken with children, teachers and managers during the project and interesting practice from the institutions forms the basis of a two part publication programme.

Much of the work that has been done has relevance to key stage 3, in addition to key stage 4. Design and Technology and Information Technology feature in the materials.

Phase 1 materials consist of twenty-four development papers of which the first ten are already available. The remaining papers will be published during September 1990. The papers are concerned predominantly with management issues and are all illustrated by accounts of practice case studies in pilot institutions. Each contains reference to general principles, opportunities and difficulties encountered across the range of project schools/colleges.

They are intended to raise awareness of issues that are of concern to all secondary institutions currently addressing the delivery of technology for National Curriculum purposes. The papers should be of interest to anyone with a responsibility for delivering technology.

Phase 2 materials will comprise three folders of curriculum, teacher and management support materials that will be published in mid 1991 with a national publisher.

The remainder of the paper is dedicated to sharing evidence accumulated from the work with pilot institutions.

It is very apparent that the key issue in most schools is that there is a lack of common understanding with respect to design technology in the curriculum at present. Educational aims associated with technology trigger much debate, particularly when teachers of different curricular areas are asked to take part in cross-curricular activities involving technology.

A strategy of coherent management, calls for a commonly and easily understood language in which teachers and managers can communicate about design and technology education in addition to working towards the development of a common understanding. Only then, can decisions at one level (e.g. by teachers planning curriculum activities) be taken in the confidence that they are consistent with those at other levels (e.g. curriculum managers, senior managers etc.). The school needs to address in a designerly way, all issues, from the determination of a clear philosophy and appreciation of the nature of the learning in design and technology, to the very pragmatic issues concerned with managing and planning course materials, accommodation etc.

Schools must seek to develop clear policies, common values and consistent expectations for the delivery of design and technology in the curriculum.

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Central both to TVEI and to the National Curriculum is the nature of pupils' learning experiences in design and technology. However, the experiential, negotiated approach is not always understood or sought by those teachers who perceive an over-riding importance of providing pupils with information, the possession of which can be easily assessed, recorded and reported. Equally so, children need to be in possession of certain knowledge and skills before being able to exercise judgement and apply knowledge and understanding in a holistic way.

Schools need to address as a 'whole institution', each of the following within the context of the National Curriculum, its attainment targets and programs of study.

- \* Whole School aims need to be clear in respect of what the school is striving to achieve. Particularly with regard to attainment and the values promoted.
- \* The nature of learning experiences in design and technology needs to be understood by those delivering it. Research needs to be undertaken in order to inform about issues of progression, differentiation and the transfer of skills across contexts.
- \* Methods of delivering learning experiences need to be determined that reflect the schools, views on the issues above (through subjects, projects etc.)
- \* Management issues, including audit to identify strengths; timetable modelling; team building opportunities; staff INSET etc., are the keys to ensuring a flexible approach to delivery, whilst not losing sight of the aim of delivering quality experiences to children and providing them with the opportunity to achieve high quality outcomes.
- \* Use of contexts and resources including accommodation need to be planned accordingly to maximise the use of local resources, links and benefits of the provisions that exist.

As an example, this Buckinghamshire schools' development plan involved researching pupil and staff views in technology and using the findings to develop curriculum activities and a meetings structure that could build on what was identified as good practice in the school. Different groups of staff were carefully introduced to the debate on technology and the planning of student programmes was undertaken by involving relevant staff and senior managers in a way that clearly focussed the development work.

In order to plan development effectively, changes must be managed in technology. The purpose of the change, is to produce new materials; behaviours; beliefs; understanding and practices, in order to produce the need for new organisation. This process must build on existing strengths to produce evolutionary growth.

If attitudes and values towards learning in design and technology and its implications for teaching and learning do not change and develop, the result is 'failed change'.

The process of change must involve an initiation stage, where those that are sensitive to the need for change are introduced to the new methods and ways of thinking and working. Implementation will then involve management; clear leadership roles; identified teams; meetings; changes to syllabi etc. This has a resulting impact on children and staff. Learning and teaching outcomes must then be evaluated in the light of experience and decisions made as to whether or not the outcomes justify the means in terms of effort and other priorities. Some outcomes will be identified as useful - others will be rejected.

Nothing about technology is passive. Active engagement is fundamental and ownership must be built at all levels.

Schools must clearly build on what is recognised good practice within their institutions and look to analysing classroom delivery, staff strengths, resources and accreditation methods. Reviewing existing delivery must also begin with the received curriculum, not solely with what is intended by staff.

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It is up to an individual institution to plan how it will deliver National Curriculum. This could incorporate the use of courses, project time, subject enhancement and other ways of increasing flexibility in the use of allocated time and expertise to the delivery of technology.

Clearly a delivery policy must offer purpose and structure to the approach adopted by a school, including the classroom delivery aspect, staff training and management methods.

Finally an action plan that brings together the planning, implementation and evaluation stages into a rigorous yet flexible structure through which schools can tie together vision and practice.

There are of course associated with this approach, key management features. The identification of needs at all levels within the institution including pupil, teachers, parents etc. Communication issues to facilitate the development of climate and awareness resulting in wide ownership of change. The implementation of the action plan within the framework of the delivery policy.

In order to achieve the scale of development required, these changes must be signalled and led by people that have the sensitivity to the nature of the change required. They must also have the ability to relate to and work with staff and others on the right professional basis. They must be able to lead teams, as well as contribute as a team member.

Senior management in school clearly have major responsibilities in ensuring that design and technology is given a high enough profile on the school curriculum. Active Leadership is required to develop teams that are confident and competent to deliver design and technology.

Particularly important, are the decisions made concerning the appointment of key staff, such as The Technology Manager (Co-ordinator) and the enabling support given to allow effective reviews to take place and to allow flexible responses to needs as they arrive, both with regard to curriculum delivery and professional development.

Developing the ethos in a school, depends greatly upon influencing the climate and culture. The Technology Manager's (Co-ordinator's) role is hence wider than that of being purely associated with the delivery of the National Curriculum but needs to involve all aspects of school life.

Management, curriculum and professional development will need to be undertaken within a timescale that is realistic for a school. This should be built on the schools strengths and developed accordingly to meet current and anticipated needs. The operational management of design and technology needs therefore to be led and developed by a Technology Manager (Co-ordinator).

The role is undoubtedly a wide ranging one and from the experiences of the pilot institutions in the 6 Counties Technology Project, demands wide ranging skills. Critically to hold a vision and be able to manage change in order to realise the vision. Undoubtedly the generic skills are those associated with the management of people.

Factors that should influence the selection of such people are:-

- \* A sensitivity to the nature of design and technology
- \* The ability to manage people, time and resources
- \* The confidence and capability to handle the uncomfortable state of continuous change
- \* The ability to justify change.

The qualities that a technology manager are likely to possess include that of having:

- \* Senior status in a school
- \* Easy access to management
- \* Decision making capability
- \* The ability to network other groups working in a school and local community e.g. (personal and social development; profiling etc.)

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- \* The competence in team building skills
- \* Vision and sensitivity to issues concerned with Design and Technology
- \* The ability to work across subject areas in a school and respect other disciplines and their ethos
- \* The ability to build confidence in self and others.

Subject background is irrelevant in respect of these qualities.

By 1995, all students in secondary schools at age 16 will have covered a complete National Curriculum entitlement for technology. It surely must then be seen, if this pre -16 entitlement is to have any value for students, employers and teachers, for there to be a key stage 5, or post 16 entitlement for technology. Most certainly the acceptance of information technology as a core skill seems to be readily accepted and by that stage, we can hope for each teacher and certainly every department in a secondary school, to have taken ownership of Information technology as part of their individual and collective professional responsibilities.

The future is an extremely exciting and challenging one. Delivering design and technology is a microcosm of education itself in respect of the issues that must be addressed and I would like to identify in summary four cornerstones to the determination of success. They are:

- \* The development of a common understanding
- \* Valueing
- \* The development of partnerships and active involvement of partners from wide ranging backgrounds and circumstances
- \* The rigorous application of individual institution approaches