Tell Me What You Want, What You Really, Really Want

**Mark Wilders
and James Pitt**

Abstract

Too often discussions on curriculum development fail to examine underlying assumptions about the nature of education, the identity of design and technology as a 'subject', and its place in the whole school curriculum.[1] Even our National Curriculum document offers no rationale behind the statutory order.[2] Indeed there is a danger that design and technology teachers simply do not have time to reflect.[3] The DATA consultative paper[4] provided a valuable framework for discussion. The present article reports on a workshop at the 1998 DATA Conference. This took the form of a structured, participatory debate, led by two Nuffield Area Field Officers holding differing views on certain fundamental issues. Eight key issues were raised with the leaders presenting a range of arguments. Delegates were then invited to contribute further views before registering their agreement with one of three statements designed to gauge their position on these issues. Following the workshop the findings were collated and presented back to delegates.

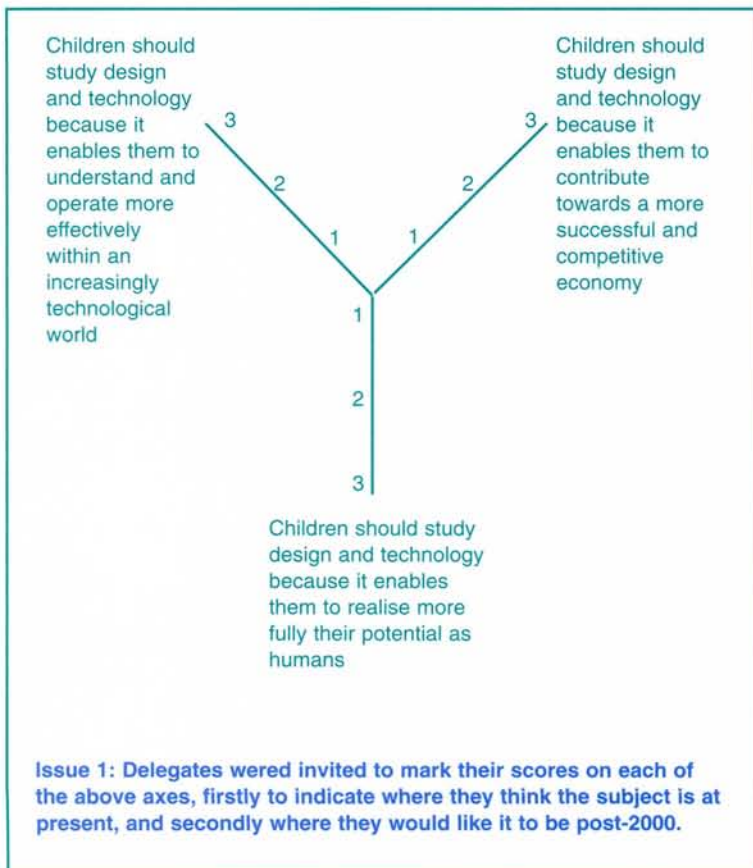### Issue 1 Why should children study design and technology?
(Introduced by JP)

Gandhi held that if you did not understand how the tram conductor's ticket punch operated, you should not ride on the tram! For him, it was important that all technologies should be accessible and comprehensible, on a human scale. This is one justification for compulsory design and technology in schools. We live in an increasingly technological society in that the pervasiveness of technology, and its rate of change, are unprecedented. Thus well-educated school leavers should have a basic technological literacy and competence if they are to operate effectively.

> **"People are surrounded on all hands by inventions and creations of the human mind with which they have no contact at all. It is the beginning of unsocial life to accept these creations and inventions without understanding them."**
> **– Rudolf Steiner**

An alternative justification for compulsory design and technology can be found within the economic-functionalist approach. James Callaghan articulated a vision of education in his Ruskin College speech in 1976. The prime purpose of all school based education was to improve a country's economic performance. This view continued through subsequent Conservative governments, and is still central to the Blair government's vision.

At the risk of seeming old-fashioned and un-reconstructedly child-centred, I would argue that in giving children experiences to develop skills in designing and making, we give them the opportunity to develop more fully as humans. One thing which distinguishes us from other animals is our ability to make choices which are not just the products of instinct and conditioning. We are capable of moral acts. We can entertain 'what if...' type propositions. We can come up with alternatives and make decisions. We can reflect on the results of trial and error, of experiments. Design and technology education in England, Wales and Scotland has been constructed within a humanistic framework. Its justification as a compulsory part of the curriculum is that children develop their moral, aesthetic, physical, creative and analytic capabilities through practical problem-solving in response to human need. As a learning area (I prefer to call it this rather than a 'subject'), it is rooted in the real world, in the real lives of people. It is a constructive matrix for the development of citizenship.

Children should study design and technology because it enables them to understand and operate more effectively within an increasingly technological world

Children should study design and technology because it enables them to contribute towards a more successful and competitive economy

Children should study design and technology because it enables them to realise more fully their potential as humans

Issue 1: Delegates wered invited to mark their scores on each of the above axes, firstly to indicate where they think the subject is at present, and secondly where they would like it to be post-2000.

RESEARCH

Introduction by MW

There are many reasons why children should study design and technology. I want to emphasise the following:

1) It should teach them about the man-made world – not just wooden toys and sausage rolls – but the whole range from small to large products, engineering to architecture, bio-technology to virtual products.

2) It is an ideal vehicle for bringing together other subjects in a holistic way.

3) It is an ideal vehicle for delivering a wide range of key transferable skills.

Issue 1 – Why should children study design and technology?

Response a) children should study design and technology because it enables them to understand and operate more effectively within an increasingly technological age

Response b) children should study design and technology because it enables them to contribute towards a more successful and competitive economy

Response c) children should study design and technology because it enables them to realise more fully their potential as humans.

> **"We want education to be part of the answer to Britain's problems, not part of the cause. To compete successfully in tomorrow's world – against Japan, Germany and the United States – we need well-educated, well-trained, creative young people."**
> **– Margaret Thatcher**

Findings – with this issue delegates were asked to indicate their strength of feeling for each of the three possibilities on a scale of one to three. The following table summarises the findings both as they see the current situation and as they would like it to be post-2000:

now	low	medium	strong
Response a)	12%	33%	55%
Response b)	24%	59%	17%
Response c)	12%	44%	44%

post-2000	low	medium	strong
Response a)	6%	35%	59%
Response b)	40%	47%	13%
Response c)	0%	12%	88%

Conclusions – delegates appeared to feel that all three responses are currently valid, but with less sympathy for the economic rationale. This response became more pronounced as they considered the future with 40% feeling this was a low priority. In contrast 88% voted for the subject's raison d'être being primarily humanistic. One might conjecture whether this response would be in line with that of the business or political communities.

> **"Education is a process of living and not a preparation for future living."**
> **– John Dewey**

Issue 2 Knowledge and understanding – how prescriptive should the National Curriculum be?

MW – My feeling is that whilst there are strong arguments for the design and technology National Curriculum being limited in prescription, these are outweighed by those for prescription. In particular, the content received by each child in the country should not be subject to limitations in the knowledge of teachers, to limitations of facilities in schools or to limitations of vision of senior management.

JP – Prescriptive? Hardly at all! We are trying to develop skills, capabilities, a framework for moral development. The more that the state prescribes content, the less chance the child has to think for himself or herself.

I agree with the views of Tolstoy and Dewey. Tolstoy held that you cannot force people to learn against their will. Dewey argued that real learning comes from within.

Issue 2 – How prescriptive should the National Curriculum be?

Response a) the National Curriculum should be highly prescriptive

Response b) the National Curriculum should be moderately prescriptive

Response c) the National Curriculum should be minimally prescriptive

Findings – with this and the following issues delegates were asked to indicate which of the responses they most nearly agreed with, both now and post-2000:

	response a)	response b)	response c)
now	11%	63%	26%
post-2000	11%	89%	0%

Conclusions – most delegates avoided the extreme positions with a slight desire indicated for more prescription in the future

Issue 3 How design/problem-solving based should design and technology be?

MW – I want to discuss this question together with question 4 – what emphasis there should be on craft skills in design and technology?

My view is that the subject should not be overly biased towards either designing or making. Before either of these activities have any value, children must gain understanding of the man-made world and the place of designing and making within it. All children will live within the man-made world and should be prepared for that experience.

Few children will be designers or makers and to skew a curriculum towards this rather specialised activity is unfair to the majority, and does not even serve the needs of the minority.

> **"Education is not something to be forced upon children and youth from without, but is the growth of capacities with which human beings are endowed at birth."**
> **– John Dewey**

JP – We should be highly orientated towards designing and problem-solving! We must not burden children with unnecessary facts. We must develop their skill and confidence so that they can find out what they need to know when they need to know. The 'facts' are forever changing with new technologies and new understandings of technology.

The need to solve problems is found in every area of life. What we should aim for is the flexible, creative, pro-active self-learner. This requires that we concentrate on the process, not on the knowledge.

Issue 3 – How design/problem-solving based should design and technology be?

Response a) design and technology should be highly design/problem-solving based

Response b) design and technology should be moderately design/problem-solving based

Response c) design and technology should be minimally design/problem-solving based

Findings:

	response a)	response b)	response c)
now	22%	78%	0%
post-2000	5%	61%	12%

Conclusions – again delegates tended to avoid the extreme positions but a desire for less design/problem-solving in the future could be identified.

> **"Compulsion in education is impossible. It brings no results or only sad results. It has no other basis but arbitrary will. Compulsion in education is the tendency towards moral despotism raised to a principle."**
> **– Lev Tolstoy**

Issue 4 Making – what emphasis should there be on craft skills in design and technology?

JP – I use 'craft' in the broadest sense, meaning any making skill. I want to argue that it is tremendously important. Children love making things: they take real delight in making to a high quality. Too often the joy of making is denied to them. I also believe that physical education is undervalued, and that design and technology is an area in which children can develop fine motor skills and grow in physical self-confidence.

Secondly, in acquiring craft skills, children learn to choose materials and processes. Knowledge is rooted in experience.

Finally, I believe that British education has been be-devilled for centuries by an elitist dualism, which has prescribed 'practical' subjects for thick kids, and 'academic' subjects for the high flyers. This is philosophically and pedagogically nonsensical, and morally wrong. Was Michelangelo a practical or academic person? What about Brunel? Surely we want to educate the fully rounded, integrated person. Homo Faber is as important as Homo Sapiens.

So let us keep making skills firmly in the centre of the design and technology curriculum. Doing and learning are inseparable.

MW – see my comments in relation to issue 3.

Issue 4 – What emphasis should there be on craft skills in design and technology?

Response a) there should be high emphasis on craft skills in design and technology

Response b) there should be some emphasis on craft skills in design and technology

Response c) there should be low emphasis on craft skills in design and technology

Findings:

	response a)	response b)	response c)
now	26%	74%	0%
post-2000	21%	74%	5%

Conclusions – the aggregate view was on the 'high emphasis' side of the craft skill debate but with a marginal desire to reduce this emphasis in the future.

Issue 5 Focus areas – what should be the main focus areas for student activity?
Issue 6 Facilities – in which type of facilities should design and technology be taught?
(These two issues were voted on together after a joint introduction.)

JP – I think the present balance of focus areas is about right, but that we should be flexible. I am all for schools deciding which focus areas on which to concentrate.

"Education may be defined as a process of continuous reconstruction of experience with the purpose of widening and deepening its social content, while, at the same time, the individual gains control of the methods involved."
– John Dewey

I like the physical arrangements found in some of the best schools. Ideally there should be a central design/resource area, with specialist workshops off it. This both expresses the centrality of designing in the design and technology curriculum, and encourages cross-media activity. The resource area should have an excellent reference library, including electronic media and Internet access. The whole area needs to be bright, colourful, visually exciting.

I would also like to see schools building up small collections of products, including those of other cultures and ages.

MW – on issue 5 – Focus areas
The current focus areas are arbitrary, based more on tradition and prejudice than on the needs of children. They are backward looking rather than forward looking. They are low-tech rather than high-tech. They are highly influenced by existing skills and resource provision and as such serve the needs of schools rather than the needs of children.

They are narrow rather than wide. They need to be changed!

MW on issue 6 – Facilities
My view is that, since understanding should be paramount, facilities should not be skewed towards designing and making activities. They should be primarily a good quality, well resourced area for children to learn about the man-made world with limited areas devoted to designing and making activities – where these activities are appropriate to the broader aim.

Issue 5 – What should be the main focus areas for student activity?
Response a) the main focus areas should be food, textiles, resistant materials, graphic products and control

Response b) some focus areas should be added to the above list and some removed

Response c) some focus areas should be added to the above list but none removed

Findings:

	response a)	response b)	response c)
now	87%	13%	0%
post-2000	37%	20%	43%

Conclusions – the delegates appeared to vote strongly for a change to the current focus areas, preferring a broadening of the subject without the loss of the current areas.

Issue 6 – In which type of facilities should design and technology be taught?
Response a) design and technology should be taught mainly in an area with excellent ICT and multi-media resources

Response b) design and technology should be taught in a mix of specialist design and make areas

Response c) design and technology should be taught mainly in well equipped specialist making areas

---

"Knowledge is a process in the minds of living people. It is what we do as we try to find out who and where we are, and what is going on about us."
– John Holt

Findings:

	response a)	response b)	response c)
now	6%	72%	22%
post-2000	22%	72%	6%

Conclusions – delegates indicated a strong preference to stay with the current teaching facilities with a slight tendency for a more hi-tech approach.

> "True knowledge emerges only through invention and re-invention, through the restless, impatient, continuing, hopeful inquiry which men pursue in the world, with the world, and with each other."
> – Paulo Freire

Issue 7 Morals and ethics – how should design and technology address moral and ethical issues?

JP – I was profoundly influenced by Glenda Prime of The University of The West Indies. In unpacking the statement above, two main themes appear. Firstly, that designing and making, and hence design and technology education, is aimed at making the world a better place. The word 'improve' is a moral term. Secondly, it focuses on human relationships. It is not just to make the world better for me (or any other individual) – it is to make human interactions run more smoothly, to fulfil people's deepest desires as social beings. All our interactions are mediated by technology – the products we use, the clothes we wear, the environments in which we live – all these have an impact on how we perceive each other and relate to each other.

I was also deeply moved the first time I read the statement addressed to the teacher. It should be pinned up on the wall of every workshop and design studio.

The challenge, then, is to integrate the discussion of values into the way we teach design and technology. This is not the same as inculcating specific attitudes. That is not our job beyond developing respect for self and others. Each child must be given the opportunity to develop their own basis for moral decision making. But we do need to help our students realise that every act has a social consequence, and that every technological change has huge consequences, whether they be social, cultural, economic or ecological. VALIDATE has done some

important work on this. It is also embedded in the Nuffield and RCA teaching materials at Key Stage 3 and Key Stage 4. I believe that values issues should inform every design analysis (IDEA) and DMA that children undertake.

MW – Morals and ethics should permeate all subject areas, both in content and delivery. design and technology should be no different to any other subject: but it has unique opportunities by giving a reality to abstract concepts.

Issue 7 – How should design and technology address moral and ethical issues?

Response a) morals and ethics should be central to design and technology

Response b) morals and ethics should be on the periphery of design and technology

Response c) morals and ethics should not be taught in design and technology

Findings:

	response a)	response b)	response c)
now	14%	68%	3%
post-2000	68%	32%	0%

> "Nobody can be a true philosopher who is not also able, in an emergency, to darn his stockings and mend his clothes."
> – Rudolf Steiner

Conclusions – a very strong moral stand was taken for the future of the subject, contrasting with the way delegates perceived the current situation .

Issue 8 The design and technology context – how should areas such as the historical and cultural aspects of design and technology be taught?

MW – A rigorous, prescribed, organised but not over-bearing historical and cultural perspective is essential to children's understanding of the man-made world and the place of design and technology within it.

We would not consider teaching music without Beethoven, art without Rembrandt, nor science without Newton – so too with design and technology!

JP – The main vehicle for doing this must be through design analysis. Personally I am against a prescribed 'history of technology' syllabus. What I would like to see is every child asking, 'What can I learn from other times? What can I learn from other cultures?'

when he or she is confronted with a design problem.

Often the best way to teach theory of materials, processes, structures, control systems etc. is through analysing products. Much pre-electronic or pre – 'black box' technology is delightful in its transparency. And by studying the artifacts of other times and cultures children can be encouraged to respect others and learn from them.

"Doing is learning. Knowledge is action." – John Holt

On balance, I would argue for ad-hoccery (depending on the projects being done in the school), within a commitment to ensure that the cultural and historical aspects are considered wherever possible.

Issue 8 – How should areas such as the historical and cultural aspects of design and technology be taught?
Response a) historical and cultural aspects of design and technology should be taught in a systematic and rigorous way

Response b) historical and cultural aspects of design and technology should be taught in an ad-hoc way

Response a) historical and cultural aspects of design and technology should not be taught

Findings:

	response a)	response b)	response c)
now	13%	81%	6%
post-2000	48%	52%	0%

Conclusions – a similar stand was taken to this issue as on the previous issue, with a pronounced desire being expressed for a more central place for the teaching of historical and cultural issues.

Discussion and conclusion
By no means could this audience be seen as statistically significant. The number of returns was small – 19 people out of 25 attending the workshop completed questionnaires. The delegates included teachers, lecturers, people involved in curriculum development projects and at least one commercial publisher. They could not be assumed to be representative of the wide variety of opinions held both within and without the teaching profession. But they do offer certain insights.

What are the significant issues raised by this snapshot of teachers' attitudes? Essentially, we are discussing the soul of the subject design and technology.

There is a clear wish that the subject should be construed in child-centred terms. Designing is a human activity that transcends time, place and culture. The majority of teachers feel that this should inform the way the subject is constructed. At the same time there is a wish to see a body of technological knowledge built into the curriculum requirements, and an unwillingness to see craft skills abandoned in favour of a knowledge based approach. Furthermore, issues of values need to be placed more centrally.

**Dear Teacher,
I am a survivor of a
concentration camp.
My eyes saw what no man
should witness:
Gas chambers built by
learned engineers,
Children poisoned by
educated physicians,
Infants killed by trained nurses,
Women and children shot and
burned by high school and
college graduates.
So I am suspicious of education.
My request is this:
Help your students become
more human.
Your efforts must never produce
learned monsters, skilled
psychopaths, educated
Eichmanns.
Reading, writing and arithmetic
are important only if they
serve to make our children
more human.
– Source unknown**

At the time of writing, the consultation on the new curriculum is in its final phase. The aims of design and technology, as expressed in the QCA Consultation document support this broad, humanistic approach[1]. But the content of the programme of study does not fully reflect these high ideals.

Many other countries have developed their own curricula for design and technology in a way that is inspired by the British design-based approaches. They see that this offers a way of developing children's creativity and flexibility, both as an end in itself, and as a

means of preparing children for a world of work in which pro-activity and the ability to learn throughout life are highly prized.

In our opinion, it is essential that we build on the successes of a humanistic, child-centred approach, and that as we go more 'high-tech' with requirements for CAD/CAM and greater emphasis on systems and control, that we keep at the front of our minds this simple thought: the purpose of all designing and making is to make the world better for everyone.

> ## "The purpose of all designing and making must be to improve the quality of human relationships."
> ## – Glenda Prime

Final thought

"In educating children as designer-makers, we seek to create a learning environment in which they become more fully human, as well as acquire technical skills, knowledge and understanding. Technology education is as much to do with developing social responsibility as with making products which function efficiently." Policy statement of Technology & Enterprise Education in Russia

Reference

1. QCA & DfEE (1999) The review of the National Curriculum in England and Wales: The consultation materials Qualifications and Curriculum Authority Internet Site

The place of design and technology in the curriculum is expressed as follows:

"Design and technology contributes to the school curriculum by preparing all young people to participate in a rapidly changing technological world. It enables them to understand how to think and intervene creatively to improve that world, combining their knowledge with understanding of aesthetics and function. It helps pupils to become discriminating and informed users of products, and to contribute to their home life and the community. As they develop systems and make products which enhance the quality of life, design and technology broadens their understanding of industrial production and commercial practices. Pupils learn to become autonomous and creative problem solvers both as individuals and in working with others... Pupils learn to recognise needs, wants and opportunities and respond to these by producing a range of ideas and products which they can critically reflect on and evaluate from a variety of perspectives, including use, production, marketing and environmental, cultural and aesthetic. They achieve this by considering the design and technology that exists both now and in the past and by considering its effect and uses."

(2) DFE (1995) Design & Technology in the National Curriculum London HMSO

(3) Breckon A (1998) National Curriculum Review in Design and Technology for the Year 2000 in The DATA Journal Vol 3 No 2 Summer 1998 pp101-105

(4) DATA (1997) DATA's Initial Thoughts on the National Curriculum Review Wellesbourne: DATA