Reviewing Capability in National Curriculum Assessment

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It is good practice in design and technology periodically to step outside the preoccupying activity of trying to get something to work out, and to review what is happening. This encourages reflective practice and enables us to take stock, assess how things are progressing and to modify our actions accordingly.

This year has seen a considerable amount of reflective activity as practitioners have been reviewing the current state of technology education whilst trying to make National Curriculum theory work out in practice.

This article highlights some of the underlying difficulties for National Curriculum design and technology and its assessment as they have typically been experienced by teachers over the last three years. I also wish to explore some of the reasons *why* the difficulties have arisen, since this helps us to see how practice might be improved. In so doing I will be drawing on the experience and insights gained through working within the Technology Education Research Unit (TERU), Goldsmiths' College, which has brought me into contact with hundreds of teachers and pupils across England and Wales.

Practitioners and their critics

Few of the teachers with whom TERU has worked over the last few years would claim that they are yet fully satisfied with attempts to come to terms with National Curriculum Technology. Many are seriously uneasy about the way in which the Order has been interpreted and about some of the practice that they feel they have been encouraged to adopt.

The recent process of discussion and review within the profession has enabled some of the myths of National Curriculum to be exposed for what they are, and teachers have gained confidence from having some of their fears allayed. Many are now beginning to question some of the ill-founded messages they have received about what they ought to be doing, based on interpretations of the Order which were not necessarily intended, and are modifying practice in the light of experience.

After only two years, this progress is not to be dismissed. By and large it is not teachers who underestimate the enormity of this curriculum development programme, but rather those who look in on what they are doing.

It is certainly worth attending to the criticism of those who comment on the state of technology education. But perhaps more useful is an examination as to *why* things have taken shape in the way they have, rather than drawing the conclusion that the principles of National Curriculum must unquestionably be flawed, simply because there are teething problems. Of course, there will be flaws in the document — it is, after all, a prototype undergoing evaluation.

The impact of the Order

When the National Curriculum document was finally published two years ago, it was heralded as the answer to all uncertainty about the nature of technology. One of the complaints since then has been that, in being supplied without instructions, the document still leaves teachers unsure about what to do with it. In fact, the Order is *not* a teaching model, but an assessment model. It sets out, in levels, what pupils are expected to attain in capability terms. It does not specify *how* to teach pupils to be capable. Yet teachers have been led to believe that if they get their pupils to do things as set out in the document this will result in them becoming capable.

It has taken some time to become clear that no amount of written documentation will ensure pupil capability. The irony is that the more slavishly teachers pursue what they are supposed to do, the further they get from real capability being developed.

The conclusion which some people are tempted to draw from this is that teachers cannot do what is required, even when it is spelt out for them. However, there is another conclusion which could be drawn — that is, that a document alone, however well founded, cannot do the job it has been created for unless those who are to use it are given the understanding with which to interpret it. There have been some strong messages coming through about how teachers should interpret the document, but not a lot of consistent advice. This has led to many misunderstandings, resulting in practice which teachers were encouraged to adopt and for which they are now being criticised.

The main challenge facing teachers of design and technology has been to interpret the ethos of National Curriculum and put it into practice in a way which is relevant and motivating to all pupils whilst ensuring that they become

progressively more capable. The answer must lie in teachers bringing their professional judgement and experience to the fore, but many have been understandably reluctant to do so because they feel their role to have been superseded by the Order. Hence they persevere with it at all costs.

Assessment and capability

One of the most obvious insights gained from working with teachers is that unless they are clear about the goal of enabling pupils to be capable, it is very difficult to plan a curriculum route which will help pupils on that journey, and even more difficult to determine whether or not pupils are capable as a result of these experiences. Hence assessment becomes problematic. The key is to be clear about what it means to be capable in the National Curriculum terms, and to develop a model of how teachers will use their experience and expertise to enable their pupils to become capable. Only then will we move closer to getting assessment right — not just in terms of satisfying the statutory requirements, but to our own satisfaction as professionals who can feel we are succeeding by equipping pupils with the appropriate types of technological experiences — those which facilitate capability.

Of course the purpose of assessment should be directly related to pupils' learning and progression, and this is not the case if pupils are doing things in order to be assessed. Whilst teachers do not need to be convinced about this, the way in which National Curriculum assessment has been introduced has meant that assessment has been seen as the purpose behind National Curriculum, largely because it seems to have so many assessment requirements attached to it and because it states what pupils should be able to attain, but not to say how they get there. Importantly, we need to be moving to a position whereby pupils are engaged in the kind of worthwhile experience that results in them developing their capability, so that this can be assessed as it develops.

A pertinent question to ask might then be: 'What do we mean when we say that we are teaching pupils to be capable?' 'Capable in what?' 'Capable for what?' 'Capable *about* what?' It has been said that the document does not provide the answers to these questions in a form which is readily accessible to teachers. It is, therefore, worthwhile going back to basics, and refocusing on the purpose of design and technology.

Presumably, the aim is to educate young people to be capable in a society where they are constantly interacting with the made world, and they are at a distinct disadvantage if they cannot deal competently and practically with the challenges presented to them.

In particular, teachers are aiming for pupils to be creative, innovative competent and knowledgeable in relation to a broad range of the technological materials, skills and processes of the real world. Design and technology education should, therefore, give rise to a practical, vocational curriculum where the emphasis is on putting ideas into practice, whilst at the same time being reflective about the 'what, why and how' of that practice.

This is considered an educationally valid goal because it produces pupils who can both 'think' and 'do' for themselves in real contexts, and who are equipped with the knowledge, understanding and skills to act capably. If this is the goal, then how do teachers use the Order to achieve it?

Using the Order to Build a Teaching Model

Firstly, it is important to clarify the role of the attainments targets for curriculum and assessment purposes. The way in which they have typically been interpreted to date has created problems for assessment, because design and technology is seen to be about 'doing the attainment targets' — as if this represents attainment in its own right. Whilst 'doing the attainment targets' might result in pupils being engaged in technological activity, it is not necessarily purposeful beyond evidence for assessment, and pupils may experience design& technology without developing their capability at all.

If any key stage is viewed as a programme of learning, during which pupils will be acquiring and developing the knowledge, skills and understanding (from the programme of study) with which to become capable, then the attainment target represent those processes with which pupils will be engaged in design and technology activity.

Failure to develop a balance of both the programme of study and the attainment targets actually means a failure to develop capability.

Pupils are not capable just by acquiring knowledge for its own sake. Nor are they capable just by being able to handle the design process. It is the interaction of the two that is sought. We have seen many pupils who are getting increasingly more confident (and not necessarily any better) at designing, whilst only demonstrating a very low level of knowledge and understanding about, for example, the technical and production issues of what they are doing. They can generate ideas, but do not possess the resources to work these out with real materials. Often they are engaged in theoretical, 'blue sky' design which is never realised.

After all, how can one be a good designer and maker without being practically knowledgeable in the use of materials, tools and processes? Without being able to generate ideas, having seen opportunities for design and technology solutions? Without being able to plan and organise for their ideas to work out successfully? Without investigating and exploring materials, tools and equipment in order to develop and realise ideas? Without appraising what they are doing, how they are doing it, and having a sense of why it is a worthwhile thing to do? Without looking at the issues which surround their task and context, taking these on board and making decisions in relation to them?

If the attainment targets are described in this way, rather than as a series of stage which pupils must, of necessity, move through, then their purpose in designing and making becomes obvious. It also becomes evident that there are knowledge and skills attached to engaging in these processes with any competence, and that the purpose of acquiring and developing knowledge and skills in design and technology is in order that pupils can progressively handle activities with broader and deeper knowledge, skill and understanding, with a range of materials and working in different contexts. Teachers have been deflected from this issue with National Curriculum, because they have received the message that design and technology is about process above all else. It has also been implied that capability is acquired by osmosis, rather than by teaching. Whilst, in part, it may be acquired through experience, such experience needs to be structured to ensure that learning takes place. This in turn means that pupils can be taught!

Design and technology entitlement

Given that the National Curriculum is an entitlement curriculum, it becomes crucial that pupils are enabled to become technologically capable in the fullest range of materials and contexts that they are likely to encounter in their lives — hence artists' media, food, resistant materials and textiles are identified as valid materials with which pupils can work. To suggest otherwise is to suggest that some activity is more technological simply because of the materials being used. This is not a helpful line of argument. It implies a narrow view of technology and denies the fact that capability will develop through a range and variety of appropriate activity. However, perhaps the notion of 'range' has been overemphasised, and we have reached the point where range needs to be balanced by addressing breadth and depth.

Planning the design and technology curriculum will then involve identifying the knowledge, skills and competencies which form the building bricks of capability, and structuring these into activities which motivate pupils to develop capability in practical and relevant ways.

There are many activities of different types, lengths and styles which will contribute towards pupils becoming capable. It has, however, rather been assumed that the best type of project for design and technology is the extended one. This is a useful vehicle, particularly for giving pupils the opportunity to demonstrate their full capability, rather than just aspects of it. Yet sometimes it may be more appropriate, in terms of what teachers want pupils to learn, to present something to them by means of a demonstration, or by formal teaching, or by a short focused activity. What becomes crucial is that, when taken together, these different activities constitute a coherent and balanced learning programme, and not a series of disjointed experiences. This necessitates the design and technology team in a school working together to plan the learning programme and to establish a manageable means of assessing pupils' progress in relation to it.

Similarly, there are many and varied starting points for design and technology activity and it is good practice to provide pupils with experience of this range. If pupils are expected

always to carry out activities in the same way, then 'doing projects' becomes a formula to be followed rigidly. Pupils become adept in dealing with the formula but do not necessarily become capable.

Involving the learners and looking for evidence

Pupils also need to understand what is expected of them, and what it is to be a good design technologist, otherwise they are playing a constant guessing game — trying to come up with whatever they think the teacher is expecting of them. The teaching team need to have a shared understanding of design and technology which they then pass onto their pupils in terms of what they are asking them to do, how they are expecting them to think and work, and the language they are using with pupils.

Consistency of message and standards will help pupils to appreciate what it is to be doing design and technology, and that they are developing their capability when doing this through the medium of food, textiles, art and graphics, wood, metal or plastic. Otherwise, as far as pupils are concerned, they are doing something totally different every time they change teacher or room, rather than making connections between pieces of the whole. These connections are necessary if pupils are to understand what capability is and attain in relation to it.

Evidence of capability will take a variety of forms (outcomes, documentation, graphics, photos, results of activity), but these mean very little without the teacher's perception and knowledge of:

- how pupils interact with materials, tools and processes
- how pupils grapple with ideas and issues and how reflective they are whilst also being active
- knowledge, skill and understanding they are developing their design ideas (breadth, depth and range)
- things they do and say when interacting with the teacher
- how they interact and collaborate with others
- how they reason, justify and are critical about the what, how and why of their activity.

Purpose of Assessment and Recording

There is no requirement within National Curriculum for every aspect of every design and technology activity to be recorded, assessed and retained. A reasonable amount of evidence should be retained from such activities (enough to validate judgements being made of different levels of capability), but it is up to each school and department to decide what arrangements they will make to ensure that pupils are assessed as a normal part of teaching and learning, and how best to collect that evidence.

There is also a distinction between (i) ongoing formative and diagnostic assessment, where the teacher's purpose is to monitor progress and to see whether pupils are acquiring and developing knowledge, skills and understanding and bringing them to bear on their work; and, (ii) summative assessment where the purpose is to sum up, at a particular point in time, pupils' attainments to date against the statements in the Order. In view of the fact that no 'big picture' of where assessment fits into the larger curriculum framework has been given, the roles of these different means of assessment are being confused, with teachers thinking that all assessment should be carried out against all statements in the Order, when this is time-consuming and not always appropriate or necessary.

Teachers may decide to assess pupils in overall capability terms and against the Attainment Targets only at the end of each term, or module, or whenever their school would usually report to parents, but this will happen alongside diagnostic and formative assessment of progress during the key stage.

Recording pupils' experiences against learning aims should not be confused with making assessments (judging development) of their capability, which is a different exercise done for a different purpose. The recording of pupils' experiences needs to do something more than track coverage — the information gathered is for the purpose of recording not just what pupils have done, but whether they have learnt anything by doing it — have they really acquired some understanding or competency, or have they just vaguely visited something?

Consistent interpretations of the statements of attainment will be aided by teachers working

together and discussing how and why various judgements of pupils' work have been made. Teachers reported that one of the most valuable exercises that they carried out as part of TERU's assessment trialling was the setting up of agreement trials within their schools, and between neighbouring schools. This prompted open discussion whereby teachers were asked to justify their professional judgements and explain how they were interpreting evidence of capability in relation to the Statements of Attainment.

Conclusion

The formal review of the Order will hopefully clarify some of the sound principles of design and technology, putting them into a more manageable perspective, without narrowing the curriculum in a way which reduces the educational entitlement of pupils. Meanwhile teachers need to feel that they are right to regain control over their pupils' learning. They need to approach National Curriculum as a framework within which to make decisions about appropriate programmes of learning and how best to assess how pupils are progressing as a result of them. Teachers need support to consolidate good practice and to build on this. Without such an input from the teaching profession, no amount of statutory regulations about what should be taught and what should be assessed will have any positive effect on the quality of the curriculum.

These and other issues for assessment are further exemplified in a forthcoming book from TERU, to be published by Hodder & Stoughton (ISBN 0 340 57305 8) and in an Assessment Inset video soon to be available from Kent Education TV, Barton Road, Dover.