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TRANSFERRING CAPABILITY
(moving in indeterminate zones)

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This paper considers some of the background to the construction of National Curriculum Design & Technology and speculates about its progress into the future. The paper draws distinctions between the task as envisaged in the Working Group's proposals and the processes by which that task may be accomplished. Its considerations are linked to the thinking arising from the GRASP* project at King Alfred's College, Winchester.

NC D&T is designed for the future. It takes us into the realms of "what might be."(1) The declared intention of the Working Group is that "this new departure"(1) should operate in the "indeterminate zones of practice"(1). The proposals for Design and Technology are directed towards a concept of capability. They are designed with achieving in mind. Their political background is linked to a desire to shift education in the direction of getting things done, making things happen. The Working Group, asserting that the proposals are based on the

"recognition that the capability to investigate, design, make and appraise is as important as the acquisition of knowledge"(2)

places the proposals within a radical arena.

If NC D&T really is going to help build "capability to operate effectively in the made world"(1), we need to keep refreshed our sense of the contents of that world. Ideas are just as much "made" as more tangible artefacts. The making of ideas always interlocks with whatever other forms of making any of us engage in. The practical and the theoretical are inextricably connected. The NC proposals recognise this interconnection. Their attainment targets are designed to ensure that "pupils develop the ability" to:

"intervene purposefully" "speculate" "model" "plan"
"achieve" "appraise" "understand"(2).

These verbs have at least as much to do with the making of ideas as with the making of artefacts.
The NC D&T recommendations are of course themselves designed and made from ideas. Simply stated, the theory is that, by making available to children activities which require the purposeful management of progressively complex competencies, we will be enabling them to operate more successfully, at a later date and in quite different situations. We could call it the theory of transferable capability. If that is the theory we are going to be working with, we need to know how it has been put together.

The theory owes much to developments set in motion by ideas first advanced by key figures such as John Dewey and Kurt Lewin, from whom much of our current thinking about experiential learning is derived. As early as 1916 Dewey was arguing that education is about:

"the reconstruction or reorganisation of experience which adds to the meaning of experience, and which increases ability to direct the course of subsequent experience"(3)

Kurt Lewin's formulation, in the 50's, of a model of experiential learning based on a cycle of experience, observation, conceptualisation and experimentation(4) has been at the heart of much of the subsequent attention to process as a vehicle for learning(5,6). It too has essential links to the theory which we now find at the centre of the NC proposals.

The study of designing itself, in its exploration of what happens within the conscious pursuit of explicitly identified intentions(7), has clearly contributed to the making of the theory behind the NC proposals. Parallel to this, but with different origins, has been the exploration of problem-solving in contexts as diverse as military strategy and social planning.

The theory behind the NC proposals also owes much to a realisation in the 20th century of the permanence of change and the reorganisation of thought which has had to accompany that realisation(8). Education has, in one way or another, to make friends with change and devise ways of equipping those whom we teach for uncertain circumstances, for "the 21st century"(2).

Previously this uncertain future has often been seen in terms of the job-market, sometimes more broadly in terms of the needs of the economy as a whole. Sometimes it has been interpreted in relation to personal and social needs. Whatever the chosen priorities in this vision of change, it
leads us, in one way or another, to a shift of emphasis away from the acquiring of knowledge. Knowledge itself we have come to see as subject to change, provisional. All this has led to interest in identifying key competencies. It led to the concept of transferable skills.

Although much of the transferable skills work started with a vocational focus, it resulted in a recognition that vocational skills and "life skills" do not belong in separate camps. If they exist as defined, by their very nature, transferable skills are going to belong in lots of places. Attempting to define "basic skills" in 1981, the FEU had in mind:

"a level of ability, achievement and understanding in essential areas of knowledge and skill which will increase a young person's chance of making a success of adult and working life."(9)

This will have a familiar ring to the avid reader of the NC D&T proposals. If we are seeking "to operate effectively in the made world"(1), we find that the central skills are, unsurprisingly, those needed both at work and elsewhere. The truly portable skills are those which support achievement whatever the context. If it is those which we need to foster, and surely it is, then how do we do it? How do we develop the appropriate pedagogic technology?

As teachers how do we plan to respond to the need identified by the NC D&T proposals? Where do we start: with the tidiness of theory or the messiness of practice? Do we break down capability into separate skills because that way it feels as if we are doing something, and in control of our task? It makes teaching feel more manageable. Certainly it makes assessment easier. Or do we approach capability as a whole because that's actually how it's used?

In touching on these dilemmas, the NC Working Group has admirably refused to give priority to the analysis of individual skills and maintained the need for a holistic approach. It has also admitted that many of the attributes it seeks to develop are "personal"(2). Will a holistic approach sit comfortably with separate attainment targets, however carefully it is stressed that they should not be used to indicate a linear process? Will we find ways of being comfortable with valuing and assessing the personal? In practice what kinds of experiences is the new curriculum going to produce in classrooms? To what extent will the assessment structures determine not only the what, but also the how?
To answer these questions, teachers need to recognise their own processes. When constructing classroom realities out of curriculum proposals, there is an understandable tendency to go for the specific, to fall back on familiar ingredients. Indeed the programmes of study, with their repeated litany of things which will "be taught"(1 & 2), invite such a response. Writing about the designing of an Indian village, Alexander warned that:

"We sometimes forget how deeply the nature of an object is determined by the nature of its components."(7)

It is worth reiterating this warning. The known components of classroom experiences are specific content areas, delivered in certain ways. In practice the pull is always to the specific, because it is familiar, tangible, secure, and, again, easier to assess.

However in the terms of the NC D&T attainment targets, "knowledge, skills and values"(2) must be exercised in pursuit of recognised purpose. They need to serve as component parts of general capability: they are only of use when put to use to get results. For those of us who have learned to identify our own capability mainly in terms of specific areas of expertise this is a difficult concept to work with. We tend to keep our hard won specialisms firmly at the front of our attention and certainly at the top of our value systems. In this way we can be easily distracted from the accurate identification of the needs presented by a particular context. We can go on interpreting problems from the standpoint of that specialised expertise in circumstances where the expertise is inappropriate. Guarding against that happening in our planning and implementing of NC D&T will demand from us a vigorous sense of purpose.

As part of its wider activities, the GRASP project has been working with nurses. Like teachers, nurses need technical expertise, but their effectiveness does not rest solely within that technical sphere. The nursing profession provides a case-study of people operating in the made world which can offer us useful insights.

Since the late sixties, nurses have been encouraged to perform their professional tasks within a framework called "the nursing process", which sees nursing activity as essentially a "problem-solving process". Based on an attempt to identify the precise nature of nursing expertise, it provides a structure to support nurses in the selection and development of appropriate approaches to the care of individual patients.
The nursing process identifies nursing capability as a core of problem-solving skills. These are explained under four headings: assessment, planning, implementation, evaluation. They are spoken of as "steps" or "components". Trainee nurses are taught the skills associated with each step. The qualified nurse is required to go through each step when approaching the care of each patient.

The Nursing Process is a logical, systematic approach to the total care of a patient.

It involves the following:

1. Assessing
2. Planning
3. Implementing
4. Evaluating

The nursing process was developed as a means of enabling nurses to identify more precisely the needs of particular patients, instead of automatically applying habitual systems. Previously, nurses are depicted as treating the patient as an appendectomy or a hernia, regardless of the variations between individuals and their particular circumstances. Applying the process, it is argued, can free them from these standard responses and enable them to develop flexible care plans based on individual need.
The history of the implementation of the nursing process offers a fascinating example of the progress of a good idea from theory to practice. Providing an outline model of a process is one thing. Enabling others to make effective use of it is another. A speaker at the 1982 conference: "The Management of the Nursing Process", comments:

"Around the country...it continued to be viewed with suspicion, fear and confusion, as to what it really meant."(11)

There has been evidence of tension between those trying to construct a soundly argued justification for the process and those at the receiving end of the ideas. Those who argue for the nursing process often seem to feel that they have to deny its theoretical content and emphasise that this is just a practical tool(12,13). Certainly the theory is presented apologetically.

Those charged with the task of putting the process into operation on the wards have not always been given the chance to make it their own. Instead the structure has been handed to them, complete with supporting theory. Consequently some nurses come to see "the process" as just another bureaucratic device. In fact those responsible for selling the idea to others do not seem to have recognised for themselves its transferability to the task of enabling others to use it. They have not automatically transferred the problem-solving skills embodied in the nursing process to their own activity as nurse managers, even though the lessons it contains are centrally relevant. They have not assessed the nature of the problem accurately, planned alternative strategies, implemented them watchfully or evaluated progressively.

In practice the implementation of the process on the wards has usually been achieved and monitored by means of a form which the nurse has been required to complete for each patient. For many nurses therefore, the process has become another routine task, not the device for freeing the nurse from routine responses, which was its intended function.

Does this start to sound familiar? Teaching based on "the design process" was intended to enable children to explore their capacity to handle technological problem-solving. It was a way of freeing children and teachers from the pursuit of prescribed tasks, predetermined regardless of purpose or personal relevance: the archetypal teapot stand. Instead, and predictably, the design process in action in the
classroom has become, in the hands of some teachers and interpreted by some classroom support material, just another means of imposing a deadening uniformity of approach: a straightjacket, not a liberty bodice. Like "the nursing process", "the design process" has proved capable of being transformed into a bureaucratic device.

The history of education in the mid 20th century is littered with curriculum innovations which did not quite make it; with intentions which were somehow never quite translated into outcomes(14,15). How can we make sure that the NC proposals do not follow the same route? It could be argued that these proposals contain a huge irony. At their centre is the wish to develop designing and making capability in children, yet they remove from those who are to implement the proposals the opportunity to design and make the curriculum. On the other hand, designing the curriculum is probably the easy bit. In fact NC D&T frees teachers to concentrate on more intricate and demanding daily designing and making functions: those encompassed within each teacher's own role as a facilitator of learning.

The more we learn about the nature of teaching as an activity, the more we come to recognise that it is, like many other forms of professional practice, in itself a complex exercise of just those capabilities which the NC seeks to develop in children, as expressed in the four attainment targets(16,17). Teaching requires careful and accurate identification of need. It involves us in the selection of routes by which that need may be answered. It requires a continual process of evaluation and review in the light of the consequences of decisions made and actions taken. We are beginning to understand that the most effective way to refine and develop teaching, "to get better at it", is to develop an explicit awareness of how we think and act when doing it(18). For this we need a metalanguage to describe the processes involved. It is just such a language of process which the NC seeks to make available to children.

The student teachers and tutors at KAC with whom I have been working all engage in design and technological activity to a high level. They are familiar with the activity of designing in a number of contexts requiring "design and technological capability". However for them, as for most of us, the transfer of these designing skills to other contexts is not automatic, nor is this transfer always recognised as a possibility. The skills and competencies are securely carried to circumstances which are labelled "Design and Technology". They are not
confidently transported elsewhere, for instance into designing and making learning environments.

Left to ourselves most of us appear to operate in our known world, the bounded world which we recognise as home for the exercise of specific skills. The skills we possess are known to us in terms of their tangible outcomes: the artefacts which are their end products. We are not yet adept at articulating them confidently as part of a generalised capability with which we approach the new and unknown. Because we do not articulate them as such, they are not put to use as such. We may possess a transferable capability, but we do not readily transfer it.

Recognition of this dilemma has led KAC to design and make a new B.A. (Design and Technology) course which has built into it a continuous thread of explicit attention to issues related to general capability. It seeks to bring these into conscious exploration by the students, requiring them to engage in a continuing debate with the contexts in which the course places them. The course requires students to explore, as a central theme, the connections between purposeful activity of different kinds in different contexts, be it work in industry, teaching in school or the designing and making of artefacts.

In this way the course refuses to allow students to limit their process awareness to the narrowness of a specialist context, engaging them instead in a conversation with a variety of contexts and causing them to recognise connections between the processes at work in these settings. In doing so it is laying the foundations for a development of professional competence which is itself rooted in those ideas which have contributed to the making of the NC proposals and which are now also beginning to reshape our understanding of how professionals learn(19). It means that we shall have to admit to the complex personal processes at work in teaching and learning, that we shall be acknowledging ideas as social and personal constructs and accepting that knowledge is provisional. It involves us in the recognition that, in whatever context, teaching itself is a problematic enterprise: "an indeterminate zone"(1).
*[Based in the Design and Technology Department at King Alfred's College, Winchester, the GRASP project has been focusing on questions of general capability: getting results and solving problems. It is funded by the DTI and the Comino Foundation, who have established related projects in Salford, in the Management Development Unit of the University, and in schools in Dudley.]*

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