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The Introduction of Practical Craft Skills into the Scottish Technology Curriculum: A New Beginning or the Beginning of the End? A Reply to my Critics

John Dakers, University of Glasgow, Scotland

Abstract
This follows from a paper presented at the conference last year (Dakers, 2003). The argument given in that paper suggested that the introduction of a subject which taught practical craft skills in a prescriptive manner, as is the case in Scotland, is likely to be a retrograde step.

The paper made the case that the learning of a craft skill, for instrumental purposes only, reduces the pupil to the level of that of an automaton. Such a pupil will consequentially have no ownership of, or creative identity in, either the process or the end product.

A major criticism of this view was that in order to master, or at least gain proficiency in a skill domain, certain necessary basic skills appropriate to that domain are an essential prior requirement. For example, if one wishes to play a musical instrument, it is first necessary to learn the playing of scales. If one wishes to manufacture a wooden pencil case, an understanding of how to operate a variety of woodworking tools, amongst other things, is a necessary prerequisite. Without prior mastery of such fundamental and basic skills, it will be impossible for a person to develop into a proficient musician or woodworker.

The criticism was taken further with the argument that these fundamental skills were also a necessary prerequisite for the design or creative process. To play a musical instrument with creative flair requires not only a formidable set of psychomotor skills requisite to the instrument, but a deep knowledge and understanding of music. Equally, in order to design the ultimate wooden pencil case, handcraft skills associated with woodworking, together with knowledge and understanding of the properties and nature of wood, are essential prerequisites.

This paper will seek to develop the argument and will take as its starting point the criticisms mentioned above. It will argue that it is not a necessary prerequisite to becoming proficient, or indeed creative, that fundamental psychomotor skills such as the rote learning of musical scales be undertaken. Learning, like design, is not only a messy process but also a very personal one. It will argued, moreover, that learning these skills in the manner suggested is, in fact, more likely to result in the de-motivation of the majority of pupils and a stifling of the creative process.

Introduction
I wish to begin by making clear my understanding of the concept of Practical Craft Skills; something which I fear may have eluded some of my critics last year. It was not my intention to deliver a polemic against the idea of practical work; rather, I was condemning the idea of practical work as action without thought, or unreflective practice.

Practical Craft Skills is an ever-increasing initiative which now forms part of the Technology curriculum in Scotland, and whose rationale, I venture to warn, may surreptitiously begin to find an audience beyond the Scottish borders. It has as its basis a neo-Technology education principle which hankers back to a nostalgic craft era when men and boys collaborated in a mimetic form of learning and teaching and where instruction in craft skills purported to make provision for the next generation of manual workers. Artefacts were prescribed and practical psychomotor skills were adjudged to be the single most crucial element of development. Because of this emphasis on practical craft skill development, the quality and complexity of the workmanship was regarded as considerably higher than that necessarily demonstrated today. As a consequence of this model, assumptions prevail that pupils exist who are unable to deal with the academic rigours necessary for engagement in the design process. These pupils are consequently happiest in the workshop and will openly resist folio work. For this reason, the return to the model described above promises to engage those formerly estranged pupils in a subject area designed to meet their needs. Whilst these are my words, they nevertheless reflect the views of a considerable number of technology teachers on this matter.
These views are not, moreover, confined to an isolated pocket of the technology education community. There is a growing part of the technology curriculum in Scotland which still ‘reveals a genealogy with clear roots in its industrial and vocationally oriented past’ (Dakers & Doherty, 2003:613). There are more technology teachers from that era teaching in Scottish Technology Departments than those emerging from university courses in which a different paradigm has been taught, one with an emphasis on design and problem based learning. The major control, consequently still lies with those who hold firmly to the notion that technology education should (and in many cases does) retain a strong emphasis on practical skill development. (Dakers & Dow, 2004; Dakers & Doherty, 2003).

The curriculum in Practical Craft Skills is dominated by performance and output from pupils. This reflects a restricted view of what technological education is and how it manifests itself. Historically, technology education was designed to serve industrial needs. As Williams (1996:54) postulates, it has ‘been more concerned with the development of in-depth manipulative competencies in a narrow range of technology areas than broad based, attitudinal and cognitive competencies’. As a result, a restricted definition of technology education predominates. This definition runs counter to both constructivist theories of teaching and learning and to policy development at the 5-14 stages of Scottish Education. Part of the problem may be that the intellectualisation of what was traditionally a craft based, production oriented subject has led to confusion among the participants. ‘The new broader type of technology education is more complex than that which has sufficed in the past, partly because intellectual processes are not directly observable, in contrast to physical skills’ (Williams, 1996:54). This problem, as Williams observes, perpetuates the performance/output emphasis of the curriculum and subverts attempts of policy makers to raise the importance of process and appropriate provision. As a result able pupils are steered away from the subject at the secondary stage and the ‘less able’ are steered towards a new ‘Nirvana’ of Practical Craft Skills with its promise of avoidance of cognitive overload.

Constructivist theories such as those postulated by Vygotsky (2000) and Bruner (1996) see learning as culturally influenced and set within a socio-historical context. Whilst experiencing the world we inhabit, we develop our understanding and knowledge of it, mediated by antecedent cultural values, artefacts and skills laid down by our forebears. We construct meaning through direct experience with the natural world, our made world, and our cultural and social environment. Thus, learning is a combination of constructing meaning through interaction with more able humans (such as teachers) and about experiencing the world we inhabit. It is not our capacity for picking up rules that directs our perception and understanding, rather, it is flexible styles of behaviour (Merleau-Ponty, 1962). As humans, we need to be able to understand the relevance of an artefact in some meaningful context beyond being instructed as to what it is or how it is to be fabricated. Learning needs to have some rationale that makes sense to the individual. Without this we enter into the realms of chaos. For Vygotsky (2000), deep understanding can only take place when a process of internalisation has taken place. For this to happen the learning situation is mediated such that abstract decontextualised rote learning of prescribed rules is made meaningful by associating it with the spontaneous or tacit knowledge the individual has acquired as a result of being in the world.

I do not argue that the development of practical craft skills is a bad thing. On the contrary, we are descendents of Homo habilis who 2.6 million years ago fashioned the first primitive tools out of simple cobbles. It is through the mediation and development of tools that our natural biological evolution was supplanted by new prosthetics which exponentially increased our power over the environment ‘beyond its natural measure’ (Arendt, 1998:140). ‘Axes now made it possible to build shelters and construct primitive settlements, and they physically changed the world once and for all’ (Burke & Ornstein, 1997:10). Tool use thus changed our primordial ancestors’ development to such an extent that what we are now, physically, intellectually and culturally is the result of tool use. But in the modern world which we now inhabit, there lies a distinction between learning tool use for the purpose of improving our collective needs and wants, and learning tool use as objective means towards prescribed ends.

Pye (1995:52) qualifies this distinction as the ‘workmanship of certainty’ and the ‘workmanship of risk.’ The former is:

‘the result of every operation during production [having] been predetermined and...outside the control of the operative once production starts’, whereas the latter is ‘the result of every operation during production [being] determined by the workman as he works and its outcome depends wholly or largely on his care, judgement and dexterity’.

Here Pye is making a distinction between the workman as craftsman, and the workman as
producer. Arendt (1998:140-141) defines this ‘workmanship of certainty’ model as fabrication:

‘The actual work of fabrication is performed under the guidance of a model in accordance with which the object is constructed. This model can be an image beheld by the eye of the mind or a blueprint in which the image has already found a tentative materialisation through work. In either case, what guides the work of fabrication is outside the fabricator and precedes the actual work process…’.

Practical Craft Skills follows the fabrication paradigm. The model to be fabricated is predetermined. Each stage in the process has been carefully planned and the pupil is expected to follow these stages precisely. Individual working patterns are promoted over collaborative approaches; the less help provided by the teacher (or others) the more credit is given. This rigid adherence to prescribed rules, in which pupils are expected to carry out rigid procedures such as planing or sawing within a set of prescribed tolerances in order to demonstrate craft ability, encourages conformity and what Martin (2000:90-91) refers to as ‘lock-in’:

‘…the complexity of the manufacturing process, and its sequential nature, in which each step is crucially dependent upon the meticulous and precise completion of the previous stage, tends to produce ‘lock-in’. Variation and innovation become increasingly hazardous’.

The pupils are given instruction in a set of skills which are not situated in any meaningful context. The pupils have no ownership of the product, only of the skill. The outcome of the exercise is to ‘contribute to the knowledge, understanding and practical experience of candidates whose aspirations and abilities are towards practical work, or who are considering a career in an industry which involves practical activity in any capacity’ (Scottish Qualification Authority, 1999:3). The product made becomes merely a device upon which skill is perfected. It is the skill that is measured in a situation where the pupils’ fabrication skills are assessed for the purpose of a potential career in fabrication. This form of pedagogy militates against creativity and risk taking. Martin (2000:99) cites several examples in industry where sequential processes of skill development lead to ‘evolutionary stasis’. In this model the only way pupils can achieve success is by continually perfecting each stage, within the tolerances given, in order to achieve the preconceived and prescriptive ideal outcome. To do otherwise, to be plus or minus one millimetre outside the set tolerances can result only in failure. To avoid this, pupils must improve their performance and output, avoid risk and ensure conformity to the rules (Ames, 1992; Dweck, 1999):

‘So that when you have got it right, you adopt the golden rule; don’t change anything. Use exactly the same materials – even though you don’t know in any rigorous way what they are. Prepare them and process them in exactly the same way each time. Suppress variation, suppress innovation, teach your apprentices [pupils] to stick rigidly to the rules’ (Martin, 2000:99-100)

In Pye’s (1995) definition of workmanship ‘rough’ workmanship is regarded as an essential part of bringing an artefact into being. Pye argues that whereas in the West, ‘rough’ workmanship is considered to demonstrate the workman’s ineptitude, in the Far East, rough workmanship is revered. It epitomises handicraft bringing an artefact into being. Pye argues that whereas in the West, ‘rough’ workmanship is considered as an essential part of the manufacturing process, whose processes obviously fall into two parts: first, perceiving the image or shape (eidos) of the product-to-be, and then organising the means and starting the execution’ (Arendt, 1998:225).

The pupil who fabricates an artefact which has both form and process already prescribed by those who know what to do and those who do it. Workmanship, in the creative domain, starts off rough in the form of ideas, sketches or models etc. As the craftsman interacts with the process, responding to the various idiosyncrasies presented by the situation, he adjusts accordingly; he decides at what stage completion has been reached. Fabrication on the other hand, expects efficiency, both in terms of economics and manufacture as well as reproducibility. Arendt distinguishes this as:

‘the division between knowing and doing, so alien to the realm of action, whose validity and meaningfulness are destroyed the moment thought and action part company, is an every day experience in fabrication, whose processes obviously fall into two parts: first, perceiving the image or shape (eidos) of the product-to-be, and then organising the means and starting the execution’ (Arendt, 1998:225).

The pupil who fabricates an artefact which has both form and process already prescribed by those who know what to do (the teacher), belongs to the population of those ‘who do’. This pupil has no say in what the end product should be; but has simply to apply the newly acquired skills to the matter of fabrication. There is no potential for creativity in this scenario. Variation is not an option; the practical activities developed are, by their very nature, activity without thought. The only thought process involved is that required to execute the psychomotor skill, which has more to do with procedural memory or ‘conditional-action sequences…[which are] forms of storage [that] tell us ‘If this, do that’ (Sternberg & Williams, 2002:278).
In thoughtful activity, each individual pupil would have some degree of ownership of both the process and the product. Within the skill procurement paradigm, however, each product has to be fabricated to an identical design, to identical standards of workmanship using identical processes. This can only reduce the fabricator to the level of automaton.

However, let us now consider the argument that these skills, once mastered, can aid the creative process.

The argument for learning a set of prescribed psychomotor skills as a prerequisite to any creative activity is problematic. Learning how to fabricate a prescribed pencil case, by rote, implies that certain tools and procedures are necessary in order to fabricate that artefact. Learning the correct operation of these tools is the main aim of the teaching/learning construct. (If the main aim of the lesson were to produce many identical and perfectly constructed pencil cases, then the teacher would choose experts to make them). Certain prescribed tool use skills begin, therefore, to be developed. These skills are situated within the construction of a specific model. The skills are then further developed through the fabrication of a more complex artefact which has once more been prescribed. This in turn introduces an increasing number of tools and processes, while at the same time reinforcing the use of those already introduced. This pedagogy is situated within a time- limited curriculum which may span only three or four years, with the result, that only a finite number of hours can be devoted to craft skill development. At some stage in the process, we must assume that a time will be reached when the class will have developed an optimal set of craft skills. This optimal stage, this prescribed level of competency must, ipso facto, restrict any future creative process which is constrained within the parameters set by the prescribed set of optimal skills acquired.

This model assumes that the ‘toolkit’ of prescribed psychomotor skills in tool use, accumulated over whatever period of time was available, in a controlled environment, devoid of risk, where two or twenty two prescribed models may have been constructed, will suddenly promote a sense of free expression and creativity. I suggest that the reverse is a more likely scenario. Under the tyranny of strict control and conformity, pupils will become so reliant upon the ‘recipe book of instruction’ that they will be more likely to avoid risk for fear of failure. If this emphasis on control and conformity has been the dominant pedagogy up to a point where liberty and freedom of expression is allowed, it cannot result in creative expression. Output that has hitherto been situated or embedded within a very narrowly defined performance framework, consisting of prescribed models will become embedded in the psyche of the pupil. (R)esearch shows that what problem-solvers of all ages in everyday and workplace situations actually do and know depends on the context in which they are asked to work, and bears little relation to what goes on in the average classroom’ (Hennessy & McCormick, 2002:113).

For pupils who are situated within this restricted performance/outcome model of Practical Craft Skills, a paradigm in which ‘aspirations and abilities are towards practical work,’ (which, significantly, society reconstitutes as ‘intellectually less able’) becomes dominant. This is the case especially where the model coincides with earlier failure in ‘academic’ subjects. Under these circumstances it provides an entire culture with its ‘sense of itself’. Anything outside this framework is marginalised and all other interpretations, all other senses of identity are lost.

To understand how pupils as a culture are situated within Practical Craft Skills, we need to review this framework. It is held together by the promise of a curriculum more suited to perceived needs and wants. This in turn correlates with the pupils’ own personal constructs of having low intellectual capacity, (which has somehow developed into being ‘good with your hands’). This paradigm offers a diminishment of cognitive engagement, where thought and interpretation are not encouraged. Aligning themselves with that promise, pupils adopt not only its standards for conformity and craft skill development, but also their perceived place in the world. They develop implicit theories about their abilities which are entity based, and difficult to alter. (Dweck, 2000)

If the end product and the means of achieving it has been prescribed in advance, with both governed by a rigid set of procedural rules, there can be no space left for creativity. The guitarist who is told that the ability to play the guitar well will necessitate the learning of musical scales, and only the learning of musical scales, will potentially become proficient in the playing of musical scales, (or will more likely give up as a result of utter boredom). In the absence of any context meaningful to the learner, that is, within a context where her own experience of music is ignored and no new musical experiences are introduced, the effect will be a sense of existing within a vacuum of musical scales. Her only understanding of music will be that of musical scales. It is preposterous to assume that in the absence of any context other than that of musical scales skill development, the learner will be able to transfer these de-contextualised skills into some creative endeavour. The end in this scenario could

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be construed as a learner ‘whose aspirations and abilities are towards practical work, or who is considering a career in an industry which involves practical activity in any capacity’ (Scottish Qualification Authority, 1999:3). The means becomes the learning of fundamental practical craft skills which, as has been argued, is meaningless unless the learner’s needs, wants and aspirations are taken into account.

Finally, a more sinister conclusion can be drawn from this argument. If fabrication is the result of prescribing the ends before enacting the means, that is a situation where the fabricator uses skill to bring into being the pre-designed end product, then not only is the pupil in Practical Craft Skills being taught the processes of fabrication, the teacher must also be considered to be a fabricator. The Practical Craft Skills curriculum is precise and unwavering. It prescribes the models to be fabricated and the tools to be used in that endeavour. The teacher is not permitted to waiver in any way. The end is promulgated in the documentation: the bringing into being a future workforce who possess prescribed manual skills. The means are enacted in the transmission of specific expert skills in a prescribed fashion. The teacher is ‘locked in’ to a model in which creative and innovative teaching is made extremely difficult. The teacher, like the pupil, becomes constrained by the parameters set by the prescribed set of optimal skills they have to develop in the pupils.

‘In a very small number of centres candidates have been allowed to adopt a ‘Craft and Design’ approach to the Woodworking Skills course project. Instead of being given a standard NAB [National Assessment Bank] drawing and instructed to lift sizes on to the appropriate material and generate skills evidence accordingly, candidates have been given more freedom, to a greater or lesser extent, to introduce their own interpretations and ‘do their own thing’. This of course is contrary to the spirit and letter of the instruction contained in the Subject Guide and must not continue if skills evidence is to be maximized’. (Scottish Qualification Authority, 2003)

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