Ethics and the technology curriculum

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Abstract
'Values' in the technology curriculum are usually put in technical or commerical terms. This can lead to a conflation, between commercial/industrial domains, and the pedagogic domains which is frequently unresolved in curriculum literature, and which can manifest itself in a confusion between instramental and intrinsic values.

Commercial artefacts are generally taken as having instrumental value only, ie they are typically valued only as means to further ends. In addition, if the artefact ceases to be commercially viable then the processes and skills contributing to its production are similarly otiose unless they can be turned to the production of other artefacts which again render them of instrumental value only.

This paper seeks to clarify the distinctions between instrinsic and instrumental value in relation to the technological curriculum, and argues that the values that should be identified and explicated are often instrinsic and not merely instrumental. The techno-scientific framework itself, it is argued, is impoverished through a tacit rendering of value systems in instrumentalist terms. Active pedagogic engagement through the technology curriculum is seen as an essential corrective towards a viable techno ethics.

I

In the current United Kingdom technology curriculum, 'values' are usually put in what might be described as technicist commercial terms. The argument [as such it is] for' values' often runs thus:

> For an artefact to have any value it must be well made and attractive: vital aspects of commercial production [sic] that can only be achieved by the teaching of practical skills and the grasping of cross-curricular themes such as economic and industrial understanding...[1]

In the commercial world, things are valued because they lead to the promotion or attainment of some further specific desired end; they are instruments in the attainment of those ends, and are valued on that account. Seen in this light, the value of most commercially manufactured artefacts is simply instrumental i.e. merely a means towards some other end. That, for example, a Ford Fiesta, coming off the the assembly-line has no value in itself either for the producer or consumer, is evidenced by the fact that if it fails post-production inspection then unless the fault can be rectified within 3 minutes of post-production time, the vehicle is simply scrapped and re-ordered on to the production line.

Again, commercial production processes themselves are simply among of the means [because that's what the vehicle after all only exists for as far as the producer or shareholder is concerned] of turning the artefact into a profit. If the artefact ceases to be commercially viable then the processes that contributed to its production are similarly otiose unless they can be turned to the production of other artefacts, again of instrumental value.[2] Indeed, the UK National Curriculum in technology tends to focus on such instrumentalities; we note that, for example [3]

> Pupils should be taught...to obtain and analyse worthwhile and valid information to develop their design approach and establish the preferences of potential users; eg use a questionnaire to determine preferences concerning colour, comfort in terms of temperature and humidity, and

> acceptable prices for an item of protective clothing.

It is not that learning to do such things is not useful; quite obviously, it is. But there is often little attempt to relate such instrumentalities or means, [in curriculum terms] to the wider ends to which techno-scientific activities may ultimately relate. The curriculum activity tends to be premised on notions such as ' preferences of potential users'. The technology is seen as an instrument aimed at the satisfaction of such preferences. These, together with 'consumers' values' tend to be taken as suitable 'ends'. We read, in another example that pupils should be taught [4]

> ...to understand that account needs to be taken of the values of consumers by examining existing products [to]...design products for particular users with due regard for their needs and values [and] ...identify the needs and preferences of users reflected in existing products; eg cultural values.

The above considerations tempt us towards what I think are two rather unsatisfactory conclusions: on the one hand it seems that 'technology' is itself a 'value-neutral' instrument whose function is merely to provide society with goods or artefacts; on the other, it seems that the question of what is 'valuable' in these goods or artefacts is cashed out in consumerist terms [it's simply whatever the 'customer' wants].

Now of course, we may want to say here, that whatever is of value in our techno-scientific culture must surely be more deeply rooted than this suggests, and indeed, I think this is so; but we are hard put to find any clear evidence of this in the current technology curriculum. If you read the documentation relating to it, you'll find it mostly refers to 'technology' and 'values' in the above terms. So- what's gone wrong? Clearly, these assumptions need to be challenged if technology itself is to be seen as a significantly worthwhile activity in curriculum terms, and if the outcome of technological endeavour is to be credited with anything other than superficial value.

II

It is commonly held that technological knowledge is concerned, like its close neighbour scientific knowledge, with matters of fact about the world. Technology and science both aim at objectivity; that is, knowledge of the way things objectively are in the world; with what can be stated as in some sense 'factual' or 'true'. Such knowledge, it is often assumed, is unproblematically value-free, or at least can be distinguished from value considerations with a clarity sufficient to render its objective or factual status distinct from value considerations. Now there is undoubtedly a lot of common sense in this assumption. It appears to be a commonplace fact about the world in which we find ourselves, that scientific and technological know-how deals with [for instance] empirical investigations of the physical world; that the behaviour of the physical world which such investigations reveal can be described through universal 'laws of nature', including [in a technological context] materials, machines and systems; that it employs powerful tools of analysis such as mathematics; and that the employment of such tools of analysis typically yields useful [and usable] predictions about a vast variety of objects within the techno-scientific domain.

Such tools are often taken as paradigms of investigative processes, rationality and objectivity, their employment typically leads to highly successful manipulation of the physical environment, and the allusion is usually to those aspects of the techno-scientific framework such as physics, engineering, chemistry and so on. However, the techno-scientific framework is far less homogeneous than this implies. 'Objectivity' and 'facts' may appear at least, to be relatively unproblematic in physics, but are not so obviously unchallengeable in other areas of science; when, for example, one considers areas of the social sciences such as economics or psychology [each of which might legitimately lay claim to being considered a part of the techno-scientific framework], it can be argued that the methodological tools used there are sufficiently different from those employed in the 'hard' sciences and technologies as to make notions of 'objectivity'

more difficult to sustain.[5] Notions such as 'facts' and 'objectivity' are really used rather differently in these different domains; they have a use which is relative to the different methodologies which have become established in those different domains. We might say, following Wittgenstein [6] that 'objectivity' is a family resemblance concept, and many different language-games can be played with it. Notions of objectivity, fact, rationality etc. have evolved along with the techno-scientific framework, of which they are inherently a part. This need not detract from their usability, but it serves to remind us that the 'objectivity' of techno-scientific activity is tied to the multiplicity of uses to which that activity is put; it is not conferred upon it by some higher authority. There is no Archimedian point to which notions of 'objectivity' can be fixed. It is, therefore, mistaken to assume that technological knowledge is 'objective' in the sense that it is somehow independent of the variety of activities to which it is put.

We can challenge the supposed 'neutrality' of technological knowledge in another way; some things at least, may be regarded as of value in themselves - that is, they have intrinsic value. We might for example, value certain medical or surgical techniques for their contribution to health or longevity; that is, as instrumentally useful. But we would regard good health as a good in itself; that is, as intrinsically good. Again, when we consider medical technologies such as 'in vitro' fertilisation we become aware that the pursuit of of such technologies is premised upon foundational assumptions about quality and value in human life and experience [eg; 'parenthood', or 'the family'] ; these values are 'written in' to such activities. Although we can distinguish between the technology itself and the ends being pursued, the technology would seem to be pointless, even meaningless, without these particular ends. The supposition that it is a neutral value-free process just awaiting application doesn't stand up to scrutiny. Yet we frequently encounter this kind of assumption in curriculum technology literature. The U.K. National Curriculum Council for example, has put forward the view that[7]

> Pupils will become aware of the ways in which technology is changing the home, the workplace and lifestyles, and they will be better placed to respond to the employment needs of business and industry. They will learn that technological change cannot be reversed and will understand its enormous power and realise that its use has to be controlled.

Note the apparent contradictions, ie, that people on the one hand are seen as simply required to "respond" to technology, yet on the other hand somehow to "control" it, or that such control apparently goes hand in hand with the "irreversibility" of technological change. Note also its apparent depersonalisation; it is a 'neutral' technology that changes "the home" rather than peoples' actions, their values etc. themselves influencing the nature and purposes of technology.

It is a common but mistaken assumption that technology and science, as distinct forms of knowledge, are 'objective' in the sense that they are value-neutral, until directed to some purpose or end [these purposes or ends being value-orientated]. 'Pure' or 'objective' techno-scientific activity in this sense is a myth; the activity comes value-loaded. Values are themselves intrinsically a part of technological processes.

III

To be objective is, it is assumed, to allude to a domain of generally uncontested facts or truths, whereas to be subjective is to be tied to individual judgement and therefore fallible. Again, this might be thought to have some basis in common sense. Our individual judgements seem more inclined to fallibility than our collective judgements. The former, it is said, lack the intersubjectivity of the latter. The truth in this, is that although the latter are intersubjective right enough, nothing about the fallibility of the former follows from this fact. My personal judgement may well be correct in a given instance. In fact if our judgements as individuals were not generally reliable at least over commonplace matters in the everyday conduct of our lives, then we

would hardly be likely to survive. However, our judgement, it is sometimes said, is also subjective in a different kind of way; it is subjective with respect to our personal preferences or values. I, for instance, may like raspberry jam whereas you may not. Now my preferring [or not] raspberry jam is not a fact about the world but merely a fact about me.

The trouble with this reading of 'subjectivity' is that it seems to lead straight to a relativism that is both moral, and aesthetic. Although the facts we may claim to know about the world may be subject to test, including the test of intersubjectivity, there seems no way of subjecting such preferences and values to any test . They remain 'personal' and it thus seems to follow that values rest simply with the individual. This kind of 'subjectivist' reading of values seems implicitly a part of the assumptions we find in the technology curriculum, and is there, I think, because it fits in rather well with the consumerism underlying it. In short, it implies that values issues, like preferences, may be addressed by simple reference to consumer products. But we need to dig deeper than this if we are to avoid such trivialisation. We need a more adequate explication of the notion of 'value'.

Values are not like preferences; the latter can [and do] frequently change. But values form part of the relatively stable frame of reference by means of which judgments can be made and opinions and views can be expressed, including of course, one's preferences concerning, for example, consumer products. Values form part of what we might call an attitudinal framework. For example, I may change my opinion about you, or come to hold different beliefs concerning you. But such changes take place against something deeper, more fundamental - my attitude to you as human being. That you are sentient, reflective, feel pain, joy, anger, despair, love, etc. forms part of this attitude. Without such a framework, we could not so much as utter an opinion, or form a belief, about others [as about much else]. Developing an opinion, forming a belief, stating a preference etc. depends upon a relatively stable attitudinal framework against which these can develop and form. Likewise, changing opinions, beliefs etc. similarly depend on such stability. Only against a relatively stable background does it become possible to assess changes of this kind. We share this framework; it is our common cultural and community heritage, so to speak. This last point is important; human value systems are, like other human practices, rooted in communities. Such phenomena depend logically, upon the existence of a community. This, I think, has profound implications; it means that the concept of community is, in an important sense, an essential dimension, in the development and continuing evolution of such practices. We owe the values we have as individuals to the community; it is from thence that they spring. This conclusion runs counter to the psychological atomism implicit in the technology curriculum's assumption of 'values' cashed out in terms of preferences which are a matter mainly for the individual.

IV

I have argued for the inherent value-ladenness of technology, and for a conception of values as rooted - essentially so - in community practices. This links our techno-scientific practices to the wider community, binding them into a shared value-system. What are the implications of this for an ethics of the technology curriculum? Clearly, perceptions there, of both of technology and values, need revision if this discussion is apposite; we need a richer notion of both and these need to be embedded in the curriculum in place of the present rather impoverished assumptions. These revisions would have some impact on both the content, and mode of delivery, of the technology curriculum; I am not, of course, advocating courses on 'ethics' to be incorporated, but rather, for a view of technological activity that would be more closely in accord with the conclusions I have drawn here. One way of promulgating this would be to focus more explicitly on programmes of technological literacy, a proposal I have discussed elsewhere.[8] The introduction of technological literacy programmes of study into the curriculum would involve developing in students an appreciation of ways in which new meanings are constructed, which itself grows out of an

active striving towards new perspectives, one which aims to get the active engagement of the individual in the creative processes essential to the forming of constructively critical perspectives through which meaning comes to be infused into the techno-scientific framework.

Technological literacy programmes might broaden the current context of the technology curriculum to confront ethically significant issues such as:

- The tensions between empowerment and entrapment of the individual
- Conflicts between Individual and organisational interests
- Difficulties of re-skilling
- Dangers of de-skilling
- Ideological debates and conflicts
- Conflicts over- and between- vested interests.

Technological literacy programmes would extend the curriculum more explicitly beyond the domain of the functional to give succinct characterisation to the processes of growth and evolution of the techno-scientific framework as it interacts with - and is itself shaped by - our community-based value systems.

References

1 TES Technology supplement (30/04/93) 'On the Home Front'

2 The further conflation of "processes' with 'skills' leads all too often to a devaluing of the human possessors of those skills of course, as well as the devaluing of the effort neede in their acquistion.

3 Department for Education UK. *Technology for Ages 5- 16* (1992) p.36

4 Ibid. pp. 28- 35

5 See Dupre J. The Disorder of Things Harvard Press (1993) for a sustained treatment of this issue.

6 Wittgenstein L. *Philosophical Investigations*. Blackwell (1953)

7 HMSO Dept. for Education & Science. *Technology in the National Curriculum.* (1990) Introduction.

8 Liddament T. (1994) Technological Literacy: The construction of Meaning. *Design Studies* Vol.15 No.2 p198- 214.