TECHNOLOGIES AND THE CURRICULUM CHOICE

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1. Technologies, not technology

Although the word technology is apparently all-embracing at its conceptual level, the picture is far less clear at the level of practice. Technology or 'ways of producing' implies a plurality of techniques rather than a one best way. Throughout history, societies have developed technologies suitable for their own needs. However, even such a simple sounding statement conceals more than it reveals. When a society's 'needs' are mentioned, there is a danger of making a misleading assumption that a society's members have equal say in determining its needs. The historical and anthropological records refute this.

Yet many educators assume that there is one technology only, Western Capitalism technology (WCT), that is worth curricular attention. Other technologies, if considered, are regarded as eccentric, old fashioned, or at best, tributaries that feed into the mighty river of so-called 'Western' technology. This last viewpoint is perhaps the most disturbing, adopted as it is for what is claimed are the best of liberal or even radical intentions. An example of this may helpfully underline the dangers of this approach.

In an attempt to demonstrate the contribution of non-white societies to Western thought, many curriculum innovators argue for the teaching of Arabic contributions to the mathematics and natural sciences, two key discipline bases for an understanding of capitalist technology. What is done however, is that the contributions that relate directly to capitalist technology are explored while the rest are unexplored and often unknown.

At this point it is helpful to clarify what is indicated by the somewhat loose phrase 'Western Capitalist technology'. Often referred to as 'Western' technology, it is in fact the specific technology that developed in Western Europe from the late 16th century in association with the growth and development of the
capitalist economic system and mode of production. Today, capitalist technology can no longer be so simply located in geographical terms: its principal centres are North America, North West Europe and Japan. In addition it could be argued that the USSR is another centre, despite its claimed rejection of the capitalist mode of production. Its retention of capitalist technology with its differing mode of production explains some of the paradox in Soviet economics and curricular aspirations. Current Soviet fears that the importation of new Western technology may bring in undesirable ideological consequences, as evidences in the work of Parrott (1983) and Hoffman and Laird (1982), presuppose an ideological purity (i.e. anti capitalist) within existing Soviet technology. Yet the continuous debate within the Soviet education system about the differential status afforded to manual and mental work reveals that WCT and its sustaining ideology was not totally swept away in 1917.

As well as being concentrated in specific regions, WCT is also essentially patriarchal, (Paulkner and Arnold 1985). United Nations statistics reveal that women, half the world's population, do two thirds of the work, gain one tenth of the world's income and own one hundredth of the world's property. If technologies' benefits to humanity are to be measured in such terms, women have clearly lost out, and continue to do so.

Although the majority of modern states are dominated by this single perspective on technology, it is by no means the only one. Two examples, one, in WCT terms, 'simple', the other 'complex', illustrate the range of efficient and effective technologies that are very much alive and kicking today.

The first example concerns the so-called Bushmen of the Kalahari. Long considered by traditional anthropologists as a classic model of a so-called primitive people, more recent analysis has revealed not only a complex social organization, but a technology that sustains a people in an ecology that is uneasily considered as beyond the limits of WCT. A similar case has also been made for the Australian Aboriginal technology. That such people have been marginalized and all but exterminated by proponents of WCT is indicative of its dominating and extirpating characteristics.

The second example is from Vietnam. In his book Chickenhawk, Moseen relates how, as a U.S. Army helicopter pilot, he walked through a deserted village that had been 'liberated' by the U.S. Army. Finding the empty home of a local carpenter, he was struck by the beauty, the utility and simplicity of the bench he found there. Solid, sturdy, it was held together without glue or
nails. He took the bench back to his helicopter. When his crewmates saw it their comment was that it was typical of the 'Gooks' that they could only manage a technology that did without nails and glue.

Behind both these examples is the idea that WCT is not only a superior technology, but is also the technology towards which all other technologies should either aspire or are developing. It is a more worrying form of earlier archaeological theories of cultural diffusion, under which a 'superior' technology evolves in one society and then spreads, like a plague bacillus, to adjoining societies. Tree ring and other forms of dating have exploded this archaeological theory (Renfrew, C.1978). A similar perspective is needed in the comparative analysis of technologies and their impact on education.

2. Ned Ludd as prophet: the neutrality of technology

To be a Luddite in English is to be closed-minded, backward-looking and resistant to change, all in a pejorative sense. Associated with this is the view that a Luddite is potentially both mindless and dangerous. This is reinforced by the common historical view that is given of the Luddites. Bands of desperate men, roaming the English countryside, rick burning and destroying the early nineteenth century equivalent of the new technology. The bands were rounded up and many of them, including Ludd, were executed. What in fact were they doing? The new technology of the Industrial Revolution was, it is true, leading to a massive expansion of England's wealth and power. But the wealth and the power were concentrated in the hands of those who owned and/or controlled the new technology. For Ludd and his followers, unconsulted about the changes which where so dramatically altering their lives, the future was one of increased pauperisation and powerlessness in Blake's 'Dark Satanic Mills'.

They, and many like them, now forgotten in conventional history, found that the introduction of new technology was anything but a neutral phenomena as some comparativists have claimed (MacLean, M.1984) of its contemporary manifestations. WCT is rarely neutral, in its conception or in impact upon people's lives. Invention and development do not take place within a societal vacuum. An example of this is the way research is currently funded in universities throughout the world. Much is directly funded by agencies concerned with warfare such as Defense Ministries and arms manufacturers; capitalist industry provides
another significant proportion as do other government agencies, but often they desire practical technological outputs which will be entrepreneurially exploited. So called 'pure' research, it is claimed, still exists, mathematics being an oft cited case. But even here, funding may be continued because of the realization that the pure research of yesterday can be the basis of the applied WCT of tomorrow. Current developments in cryptography, for example, have their foundations in abstruse theoretical mathematics dreamed up, many years earlier, as 'pure' research.

In many leading WCT countries the fear of Ludditism persists: much is made of the reluctance of workforces to accept new technologies which are claimed to be more efficient and cost effective. It is seldom the workforce. WCT is neutral neither in its academic developments nor in its economic and military applications.

WCT has been introduced into nation states, whose current technologies may derive from different traditions. The literature of development education is littered with case studies of the unforeseen and the unforeseen consequences of such introduction. If a shoe factory introduces WCT, it may produce shoes that are cheaper (and possibly better) than those produced by existing technologies. The factory workforce may well be better off than previously in material terms. But practitioners of the indigenous technology, in this case, large numbers of local cloggers, are priced out of the market in an economy that often can find no further place for them. The shoe factory profits are shipped, in part or in whole, out of the country with obvious consequences for the local economy. The process, if anything, is yet more marked with extractive WCT. Even if nationalized by the state, as has happened in the case of Gulf oil states, existing technologies are displaced, their value often realised when it is too late to save them.

This displacement is important, not for reasons of nostalgic preference for other technologies, which we would label as ethnotechnology, but because a culture and its technology are intertwined in a highly complex manner. In other words, WCT is not only not neutral in its conception and consequences at the level of production, it is not neutral in ideological terms. WCT contains within it an ideology that sustains much of the following: a. a belief in the inevitability of technological progress and change; b. a belief in the inherent value for humanity of such progress and change; c. a belief that the social relations engendered by such technology are liberating;
d. a belief in the superiority of WCT over other 'primitive' or 'non-scientific' technologies;
e. a belief that to be 'modern' implies acceptance of, and enthusiastic support for WCT;
f. a belief that WCT produces profit (used in the widest sense of the word) for all involved, however indirectly;
g. a belief that the complexity of WCT requires an education system that can meet its ever growing demands for a skilled (and compliant) workforce.

In sum, the technology that erected Zimbabwe can only be adjudged inferior to the technology that produced the non-stick frying pan; the education embodied in Angkor Wat is inferior to that provided in inner city schools in London and New York.

3. Teflon and the technological curriculum

If it took a man on the moon to provide us with the questionable virtue of the non-stick frying pan, WCT can hardly be said to be one hundred percent efficient. Yet the values embodied in WCT imbue the curriculum of most national educational systems throughout the world. We take the view that the values and ideology of the dominant technology, currently WCT, are reflected in school curricula. This is, in a sense, nearly repeating in a slightly different way what many radical writers on the curriculum have been asserting for a considerable number of years (Bowles, S. and Gintis, H. 1971; Apple, M. 1977; 1982). Educationists and others of a more conservative frame of mind have been arguing the same for a far longer period. The growth of formal technical and vocational education in many nation states is evidence of this. Three questions, however, arise from these assertions, and require closer examination, namely:
a. Can education systems select between technologies and on what criteria?
b. Can a technology (specifically WCT) be adopted in the school curriculum without the wholesale adoption of its values and ideology?
c. Can the school curriculum enable children to make choices about technologies?

Criteria for selecting between technologies can crudely be polarised as short-term cost-effectiveness against long-term cost-effectiveness; external profitability versus internal public good; potential for political and military control versus potential for developing self-determination. The impact of WCT both on its own centres and on the peripheral areas where it has encroached is
overwhelmingly towards the first section of each of these polarities. Backed by the political and the economic power of the U.S.A. and the E.E.C., WCT has brought about the destruction of the Amazon rain forest and the canals of Bangkok, has supported profits from Latin America back to the central metropoles whilst health and education for the peripheral masses are largely neglected, and has supported no matter how corrupt regimes in South Africa, Guatemala or the Philippines in order to protect its investments and profits. Some of the educational implications of the international relations of WCT have been explored under the theme of dependency (Coulby, D., 1984). But school systems, even in the countries where people are aware of these criteria polarities, can hardly select between technologies. Resistance to the social, economic and ideological invasion of WCT can hardly be fought at an educational level.

When nation states have attempted to resist Western influence they have often found themselves striving to take technology but to reject the ideology. The example of the Soviet Union has been mentioned. The cultural revolution in China may be seen as an experiment in resisting the ideologies and mode of production implications of WCT. Ironically, now that this trend has been reversed it appears that the WCT base in Chinese cities is still not strong enough to sustain a commensurate curriculum (Ma, L. and Hunter, E. (eds) 1981; Whyte, M. and Parish, W., 1984). The old polarities of communist versus capitalist hardly seem relevant here. WCT carries with it a specific mode of production, an implicit set of social relations and a consumerist ideology. Political systems may attempt to modify or distort these aspects, but in a world system dominated by WCT political events and rhetorics may point only superficial differences.

The third question concerning curricula which enable pupils to make technological choices is considered in the final section.


Since the 1976 Ruskin speech by then Prime Minister Callaghan, there has been an increasing trend in the U.K. towards stressing vocational elements in the school curriculum. Led by the Manpower Services Commission, which is responsible to the Department of Employment rather than to the Department of Education and Science, this trend began by providing low quality training for unemployed school leavers (the Youth Training Scheme). Under the influence of the MSC and with the encouragement of the government's monetarist dogma, these vocational
aspects soon penetrated the secondary curriculum through changes in the examination structure and the introduction of the Technical and Vocational Education Initiative. By 1985 these trends were penetrating to both primary and higher education. The green paper of 1985 puts great emphasis on the importance of technical and scientific subjects whilst suggesting that arts and "non-vocational" social science subjects should be given considerable less pre-eminence. The implicit link in the U.K. and elsewhere in the E.E.C. is between technology and vocation. If schools and universities would only teach computer studies instead of sociology and Shakespeare, the argument infers that their students and pupils would be able to find jobs. A move towards even further penetration of the school curriculum by WCT would lead to employment for the four million people currently jobless in the U.K. Economic nonsense ceases to be risible when it is used systematically to interfere with the curriculum of an entire education system.

This paper may have seemed to adopt the deterministic stance with regard to education systems which has characterised many critiques (Bowles, S. and Gintis, H., 1976; Apple, M., 1979, 1982). Certainly change at the level of the school curriculum is hardly likely to be sufficient to resist the encroachment of WCT. Nevertheless, in nation states where educationists and teachers have the relative autonomy to select entirely or in part the elements of the school curriculum, they can assist pupils and students to resist the tunnel vision which is one of the characteristics of WCT. It is possible for schools to teach about the uses and responsibilities of WCT rather than to instill mindless technological skills. Schools can teach about a range of technologies rather than confine themselves to the currently ascendant WCT. It is essential (contra the U.K. green paper) that pupils and students are encouraged to see the links between technology, the mode of production, patterns of national and international social and racial stratification, cultural traditions and political systems. Without this contextualisation of WCT and without access to the knowledge of alternatives, pupils and students will be trained for a place in a system they can neither challenge, understand, nor imaginatively circumvent.

Huge geographical and social inequalities in the distribution of wealth, the proliferation of costly weapons systems at the expense of small-scale agricultural and public health developments, the global spread of lowest common denominator mass culture (American T.V. dramas, European pornography, Japanese videogames) all point to the insight that WCT is not the one best way. Other alternative technologies have been developed in the past
and are being developed today. Schools and universities in many nation states still have the power or the autonomy to equip their pupils and students with the imaginative and technical capacities necessary to criticise WCT and to generate alternative possibilities. It is essential that this autonomy is used to develop and maintain a sufficiently broad based and critical curriculum.

References

Moson, R., Chickenhawk, London, 1984