

CHAPTER 3

INTERLUDE

Theoretical Frameworks

3.1. TECHNOLOGIES OF POWER

How are technology and power related? In this section I begin to tease out some theorisations of the term *technology* and its complex interrelationships with *power*. From the *Prelude*, Barnes (1988) comments that, strictly speaking, power should be taken as referring to distributions of capacity, potential, or capability. Technologies of power impact multifariously upon all stakeholders involved in activities of teaching and learning of adult and vocational mathematics: as citizens participate in their social, cultural, and civic activities; as workers and employers labour in the workplace; as students and teachers located in various educational settings teach and learn together; as teachers and their managers as employees of educational (and other) workplaces perform managerial tasks; academics as researchers and teacher educators carry out intellectual and pedagogical work; and as government policy makers, bureaucrats, and educational planning officers legislate for and enact political imperatives.

3.1.1. The Concept of Technology

The concept of *technology* is central to this monograph. Firstly, from an industrial perspective it is integrally linked with mathematics in production in the manufacturing, service, and symbolic-analytic sectors. Secondly, it is utilised as a tool of management, both in industrial settings and throughout the Australian VET sector — although, as will be argued in chapter 6, the education sector itself is being transformed from a public good to a competitive industry. Following the work of Jacques Ellul, George Grant understands technique as “the systematic utilization of the most efficient methods of producing and distributing desired goods” (Andrew, 1988, p. 303); technology is seen as the bringing together of *techne* and *logos* (our making and our knowing). Grant asserts that technology is not a set of instruments, nor a world of things, but rather is a worldview, present in attitudes to things and people, embodied in an integrated system of procedures, languages, and purposes. Minds and bodies are exploited by and attuned to the systematic control of nature. He claims that just as the subject-object split in technological research submerges subjectivity, so values are denied cognitive status in a technological world

predicated upon facts, but return as products of autonomous human will — as standardised and ‘ready-made.’ These theses resonate with those raised in earlier chapters.

The primary meaning and the publicly accepted interpretation of the Australian post-compulsory vocational education acronym *TAFE* was, and remains, Technical and Further Education — despite numerous attempts to replace it with more politically expedient alternatives. However, in recent years derivatives of the term *technology* have become more prevalent (e.g., Universities of Technology), various adjectivally qualified department and School (faculty) titles (e.g., Engineering Technology), and subject titles (e.g., Biotechnology). There has been a slippage of terminology in the progression from the low-status technical skills and knowledges to technological know-how — reflecting at one and the same time changes to industry sectors in modern society and the perceived need by the education industry for astute marketing of its products.

Andrew Feenberg (1995) argues that technology is one of the major sources of power in modern societies; the power wielded by masters of technical systems largely overshadows political democracy in the control they exert over, *inter alia*, experiences of employees and consumers. However, rather than accepting a thesis of technological determinism, Feenberg asserts that technology is but one important social variable. He claims that technological determinism draws its force from an attitude that the essence of technical objects lies in their explainable functions. Instead, he suggests that there are two hermeneutic dimensions: their social meaning and their cultural horizon. The first extends beyond the concept of ‘goal’ which strips technology of its social contexts; the second holds that technological development is constrained by cultural norms — for example, the assembly-line technology of production was specific to a certain form of capitalist economics and social context. According to Feenberg, “social meaning and functional rationality are inextricably intertwined dimensions . . . not ontologically distinct” (p. 12), as ‘double aspects’ of the same underlying technical object. Functional rationality isolates objects from their original contexts, contributing in an apparently neutral way to what he calls the ‘bias’ of technology in support of a hegemony. Feenberg continues that modern technology can only be understood against the background of the traditional technical world from which it developed. However, rather than a generic shift, he claims that there has been a significant shift in emphasis of features such as the use of precise measurements and plans, and the technical control over some people by others. Bureaucracy is one example.

3.1.2. Bureaucracy and Rationalisation: The Contribution of Max Weber

The work of Weber relating to the development of rationalisation in Western civilisation offers an insight into the processes of bureaucratisation prevalent in the institution of vocational education and training, in Australia at least. The sector derives its primary political and social importance from the initial preparation and continuing education and (re)training of actual and potential members of the workforce. A secondary but not insignificant role is to provide an alternative,

politically pertinent in statistical terms, activity to the personal void and the public liability of unemployment. In other words, a major but generally tacit goal of governments internationally is to be seen to be minimising unemployment figures. The management of the public funding and educational outcomes for 1.7 million Australian students (approximately 10% of the population), whilst being seen to be responsive to the electorate in general and to industry in particular, requires an efficient and effective bureaucracy.

Anthony Giddens (1972, p. 32) notes that contrary to liberalism and Marxism, a key theme in Weber's writings is "his emphasis upon the independent influence of the 'political' as opposed to the 'economic'." According to Weber, the relationship between democracy and bureaucracy in the modern social order creates a profound source of tension. While the development of democratic government necessarily depends upon the further advancement of bureaucratic organisation, the reverse is not true. The essential character of capitalism is in the rational orientation of productive activity. This process, such as the separation of workers from their means of production which gives rise to bureaucratic specialisation, is irreversible. Bureaucratic specialisation of tasks is, in Weber's opinion, first and foremost the characteristic of the legal-rational state; this affinity between capitalist production and rational law derives from the factor of 'calculability' intrinsic to both.

As will be elaborated in chapter 6, bureaucratic specialisation is reflected in the shifts that have taken place in ultimate responsibility for the Australian VET sector, particularly over the last two decades. Under the influence of political ideologies of neoliberalism (or economic rationalism) there has been a transition from departments headed by experienced professional educators to ministries headed by bureaucrats — in the newly legitimated structures. Calculability is of the essence, together with accountability. The influence of bureaucracy has been so pervasive in the adoption by many Australian educational institutions of the International Standards Organisation (ISO) quality assurance model — a model designed not for educational institutions but for commerce.

In contrast to the contestation over, and eventual transfer of, responsibility for secondary mathematics curriculum from the profession to the bureaucracy of the state (Horwood, 1997), mathematics teachers in the Australian VET sector have, historically, operated under different conditions of professionalism. They have never received the support of powerful universities and at best a tokenistic support from industry, and appear to have ceded their responsibilities without any sign of a struggle. It could be surmised that one explanation lies in the massive nature of bureaucratic changes which have overwhelmed teachers during the last two decades and which met with little, if any, organised resistance. In fact, the bureaucratic task was made easier in the 1980s by the actions of mathematics teachers associated with the TAFE Mathematics Common Interest Group, in the state of Victoria, who proposed and received state funding for an audit of the plethora of extant courses. (This will be further discussed in chapter 4.)

According to Giddens (1972, p. 13), "Weber recognised an absolute dichotomy between the validation of 'factual' or 'scientific' knowledge on the one hand, and of 'normative' or 'value' judgements on the other." Hence politicians' factual

knowledge can never validate their value-laden goals. The correlate to Weber's epistemological proposition that rational analysis cannot validate or disprove judgements of value is the sociological approach that "rationalised systems of social organisation do not create values, but instead only function as a *means* to furtherance of existing values" (Giddens, 1972, p. 52). The assessment of rationality takes moral objectives or ends as givens; the rational cannot evaluate competing ethical standards.

Education, through its contribution to rationalised human conduct as exemplified in the manifestation of the bureaucratised division of labour, cannot avoid specialisation. Thus, seeing intellectualism as bound up with the rationalisation of human conduct, Weber concludes that professional education has come to replace humanism (Giddens, 1972). Here Weber's theorisation helps to explain the shift towards instrumentalism in vocational mathematics education, as will be illustrated in chapter 4, and the apparent lethargy by politicians and bureaucrats towards engagement with issues such as those raised by John Stevenson (1996, 1997) and others concerning the worthwhileness of vocational curricula in general for individual students, not to mention current and future industrial and societal needs.

Although Claus Offe (1972) was writing about a late capitalist welfare state, contrasting it with the liberal capitalist society where the economic system was institutionalised as a domain beyond the authority of the state, his observations may yet be pertinent to neoliberal political regimes. He notes that social processes, almost without exception, no longer take place beyond politics. Following his argument, an alternative explanation may be found for the apparent lack of political interest in day-to-day educational practice as compared to the managerial aspects of the Australian VET sector. Considering the need by ruling parties to maintain mass loyalty, state intervention would only be justified if there appeared to be consequences arising from the current situation that would jeopardise the immediate stability of the system as a whole. In any case, teachers in the Australian VET sector have now been placed in a severely weakened political situation — as evidenced by their replaceability by trainers with minimal qualifications or (potential) technologies of education — discussed in chapter 5. Their students, with reduced powers of student unions and few financial resources to back them, have not the collective voice that employers have (Anderson & Hoare, 1996). Yet, Australian employers like their British counterparts (Stuart, 1999, 2000), traditionally reluctant to countenance the funding of initial vocational education and training have, through representatives of big business and industry, still managed to influence government policy in the direction of deregulation. Collectively, they show little evidence of concern to ameliorate the declining quality and quantity of vocational mathematics education (as evidenced in the following chapters) — in fact, just the opposite.

The growth of what Weber termed *technical rationality*, as evinced in social relationships in the form of bureaucratisation, is closely tied to the development of legal-rational norms (Giddens, 1972). From Offe's (1972) discussion of a *technocratic* concept of politics, with decision-making processes designed to maintain stability with the political focus away from the *status quo*, I now turn to the

work of Jürgen Habermas, a member of the Frankfurt School of critical sociologists along with Offe, to develop further the discussion of technology and values.

3.1.3. *Technical Rationality: The Contribution of Jürgen Habermas*

According to Paul Connerton (1976), the idea of critique is a product of the Enlightenment, extended and reformulated by the Frankfurt School. He describes the methodology of Critical Theory as being related to "the idea of critique as reflection on the conditions of knowledge in the social world" (p. 37). Its proponents argue that no system of basic concepts, such as those found in the natural sciences, is in principle possible for the study of society; reality can only be perceived through certain a priori categories embedded in the human subject. From a political perspective Critical Theory "is related to the idea of critique as an analysis of constraints imposed by the historically variable structures of the social world" (p. 38). The argument here is that our world is increasingly dependent upon science and technology, but then scientific criteria are used to determine whether or not the social world is rationally ordered. Habermas addressed several human interests: the technical, the practical, and the emancipatory (linked respectively to empirical-analytic, hermeneutic, and critical paradigms). However, Connerton notes that in the case of the interest in possible technical control this is not an empirical, demonstrable interest, but an interest in the *condition of the possibility* of natural science. In other words, not only its emergence and continued existence need to be explained, but also its procedures and methodological structure.

Habermas (1963/1974) argues that science, technology, industry, and administration are interlocked in the continual expansion of technical control over nature and concomitant refinement of administration over human beings. The social potential of science is reduced to technical control, and "emancipation by means of enlightenment is replaced by instruction in control over objective or objectified processes" (pp. 254-255). Industrialised societies are now unable to distinguish between practical (hermeneutic or interpretive) and technical power. Rather than attempt a rational consensus on the part of the community, technical control is attempted through ever-improving administration. There is a paradox in that people are externally bound to the functionally interdependent technological systems in the social order while personally being denied knowledge and, even more so, the ability to reflect on them. Rather than improved systems of manipulation, Habermas suggests a possible solution in a persistent critique.

Distinguishing between the exercise of *technique* in its former sense of guiding artisans and the modern use of the term *technology*, Habermas (1963/1974) relates the function of modern science to the social division of labour. In addition to its monopolisation powers of technical control, the other critical achievement of positivist science has been to reject all competing claims to a scientific orientation other than purposive-rational action. These are blocked out through slogans of ethical neutrality or value-freedom, according to Habermas. In fact, even this sole admissible 'value' of economy of means in the form of technical recommendations is not seen explicitly as a value because of its coincidence with rationality as such.

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