

Towards an explanation of curriculum control

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The Mathematics curriculum has undergone extensive change over the past few years and much attention has been directed towards coping with the demands of this change. However curriculum has social implications and it is important to examine the intentions of curriculum innovation, which, in turn, leads us to consider the issue of control of the curriculum. This paper draws on the work of Max Weber as it attempts to fashion an explanatory model that will provide a conceptual framework for the consideration of curriculum change within the context of curriculum control.

The industrial revolution signalled a change in the social forms of modern society. It also signalled a change in the educational aspirations of the population at large. Mass public schooling in early eighteenth century England had its origins in the form of charity, or pauper, schools that blossomed alongside the workhouse movement. By the end of the eighteenth century the role of the charity school had been transformed.

Socially and pedagogically, such charity schools were a transitional form of educational life. On the one hand they were an integral part of the domestic or craft economy of the 16th and 17th centuries, yet, on the other hand, they were also a response to the spread of wage labour (and its *alter ego*, unemployment). From the first perspective, charity schools pre-date the factory system. They were a surrogate of family life, not an alternative mode of existence. By the end of the 18th century, however, the second perspective dominated. Workhouse charity schools could no longer cope, educationally or financially, with the increasing numbers of indigent poor children who populated areas of urbanization and industrialization (Hamilton, 1980, 284).

Urgent solutions to this crisis situation were required. The customary response to the growth in size of charity schools was to form new schools. The rapid increase in school numbers towards the end of the eighteenth century, coupled with the financial burden this imposed, precluded this solution. Lancaster adapted educational administration practice from France and reorganised existing schools into a hierarchy of smaller administrative units, of 'anything up to a hundred pupils', known as 'classes'. Each class was supervised by a monitor. The basis for much of the inspiration for these new ideas rested in the arrangements that governed the relationship between workers and supervisors within the factory system (Hamilton, 1980). The application of the scientific method to the task of manufacturing resulted in rationalised modes of mass production. It is not surprising that the application of a similar approach was envisaged as a solution to the problems caused by the extension of mass schooling. *The class, like the factory, could be systematised, made rational and controlled in ways similar to those used by science and technology in organising material life* (Popkewitz, 1984, 22).

The emergence of the notion of class went hand in hand with the notion of sequential courses of study, and, thus, to the displacement of more traditional approaches to education, where the 'elect', predominantly those with the ability to pay, were involved in the pursuit of a self-directed course of studies with the assistance of a personal tutor. In schooling, rationalisation meant the dominant forms of individualised domestic production were replaced by the simultaneous instruction of batch mass production. Although this transition took several decades to emerge, the classroom as we have it today saw its birth in the application of the scientific method to the challenges of mass-schooling (Popkewitz, 1984).

The emergence of the classroom, and subsequently of curriculum, serves to highlight the close association between the educational ideas of the time and prevailing social conditions. Education has a close relationship with the wider organisation of culture and of society and this translates into a concern with the nature of the content of

schooling (Williams, 1971). The determination of the nature of school knowledge becomes an issue of social control.

Those in positions of power will attempt to define what is to be taken as knowledge, how accessible to different groups any knowledge is, and what are the accepted relationships between different knowledge areas, and between those who have access to them and make them available (Bernstein, 1971, 52).

Curriculum is pivotal not only in terms of defining the nature of the knowledge to be transmitted but also in deciding those questions that relate to the nature of a society and of its culture. Awareness of the nature of the knowledge to be learnt, as well as that of the groups that determine it, is crucial to an understanding of the nature of the curriculum.

Development of a Model

The emergence of modern Western education has taken place within the context of a capitalist society. Pertinent to an understanding of the emergence of capitalism is the work of Weber which reflects on the characteristics of capitalism and on its particular connection with Western societies (Runciman & Matthews, 1978). What factors contributed to the emergence of capitalism in Western society but not in other societies? In Weber's terms, modern Occidental society is distinguished by the rational capitalistic organisation of (formally) free labour. In using the term rational Weber is using it in much the same sense that modern business and industry uses it. He refers to rational organisation as the process whereby the firm or company is organised, or reorganised, in such a way that every arrangement is made to serve a central goal. For a business enterprise this would normally be the maximisation of profit. Not that 'capitalist' undertakings in the pursuit of profit are in themselves rare. Individuals and enterprises, with a keen eye on the acquisition of capital, have existed in all civilised societies throughout history. Our history and our literature carries records of merchants, wholesale and retail, foreign and local; money-lenders of all kinds, and banks, which began to appear in the sixteenth century. The speculator, the entrepreneur, the capitalistic adventurer have existed all over the world. With the exception of trade and banking the basic opportunities sought by these individuals has been in purely irrational speculation or in acquisition by violence or by 'booty', sometimes in actual war but particularly by fiscal plunder of subject-peoples over a long period. Even to this day examples of such activities are in evidence. However, *[s]uch economic activities are worlds apart from the methodical management of a large-scale corporation, in which success depends upon professional competence and an everyday steadiness in the conduct of affairs that is incompatible with the indispensability of any individual and the sporadic character of very risky transactions* (Bendix, 1962, 306). Capitalism, as it exists in the West, has its basis in the employment of free labour, and is structured in such a way that its pursuit of capital is conducted in a systematic and regular manner. Rational, industrial organisation, attuned to regular market opportunities for profit, rather than to political or irrationally speculative opportunities, is a characteristic of capitalism.

It is, however, not the only characteristic. Another factor, closely related to the above, was the introduction of rational book-keeping, invented in the sixteenth century by the Italian mathematician Luca Pacioli (Boyer, 1991). The introduction of book-keeping was closely associated with the separation of business concerns from family concerns. Book-keeping provided the technology to allow business to expand beyond the immediate supervision of the family enterprise. The invention of book-keeping introduced the possibility of legal accountability without reliance on family members. Corporate property became legally separated from personal property. A new environment for the pursuit of business interests was created.

The industrial revolution heralded an unprecedented expansion of scientific activity as the developing capitalism demanded technologies that would assist it to

expand. Book-keeping notwithstanding, control over widely dispersed transactions would have been ineffective without adequate communications, transportation, and effective legal sanctions. The invention of book-keeping represents the depersonalisation and, in a sense the automation, of the accounting process. This same liberalisation was eagerly sought in the manufacturing environment. Rapid expansion was not possible if the work of individuals was essential to the production process. For this to occur the work of individuals had to be depersonalised; in other words, any person with appropriate training could take their place on the production room floor. The individual, even though highly trained, became merely another cog in the production process. The expansion of manufacturing industry necessitated the development of depersonalised, or automated, machinery.

A form of social organisation was also required that would provide for the necessary conduct of a society that was to allow the regulation of economic, and other, affairs beyond the intense supervision of the family firm. Essentially, mechanisms of control needed to be established within the society, and with this control the necessary sanctions that would ensure the control was effective. In this regard, Weber identified as most important the rational structures of law and of administration. For modern rational capitalism needed not only the technical means of production, but also a mechanism for control in the form of a calculable legal system and an administration based on formal rules. It required a regulated, depersonalised context within which it could operate, and it required trained and specialised personnel to administer regulations. Training and specialisation was particularly important for the position of trained official, the position essential for the smooth running and proper functioning of the administrative system.

Of course the official, even the specialised official, is a very old constituent of societies. However no country and no age has ever experienced, as has modern Western society, the absolute and complete dependence of its whole existence, of the political, technical and economic conditions of its life, on specially trained officials (Bendix, 1962). An important characteristic of the official, unlike in previous societies, is the depersonalisation of the role. Selection of the official is dependent on merit, rather than on the whim of the employer or contingencies of colour, race or creed. What becomes important in this context is the work of the official rather than the particular person who occupies that position. To this end training becomes important. Thus, the most important functions of the everyday life of society have come to be in the hands of technically, commercially and above all professionally trained government officials. Trained governmental public officials are an essential concomitant of Western society.

How has society resolved the potential challenge that the formation of these groups pose? To this end modern society has developed social structures that ameliorate the power of individuals and specific groups within the society - while power rests with the political structure, authority within society has been embedded in the institutional structures of bureaucracy and the professions. The one denies individuals the opportunity to attain exceptional power through the control of the administrative apparatus, while the other diverts emphasis from political prestige to acquisition of status. Both require further examination.

Bureaucracy is possibly one of the most-used and most-abused terms in modern political discourse. It has come to characterise the administration of large organisations, especially governmental ones. The fact that the term continues to enjoy widespread currency is, in itself, confirmation that bureaucracy is an important concept in discussion of administrative organisation (Spann, 1971).

Discussion of bureaucracy has its intellectual roots in the work of Weber (Albrow, 1970). Weber's work was concerned with the sociology of organisations and the study of political struggle - essentially the struggle of an organisation to prevail. Weber distinguished three main types of organisation: ad hoc groups based on personal ties; more permanent organisations (referred to as patrimonial) which acquire property and raise personal loyalties into a long-term world view; and impersonal bureaucracies which organise property around an abstract set of positions and treat individuals as temporary actors filling permanent slots (Collins, 1975).

What is important for all types of organisations is the ability of the organisation to survive. In this sense, Weber saw rationality emerging as the basis for the organisation of modern society, since rationality, through its close intellectual association with the growth of scientific knowledge and the ensuing specialisation of human activities, led to rearrangements of the work practices of the organisation that could better guarantee its survival. Survival in previous times had depended on capricious loyalty to particular individuals, whereas rational-legal organisation was founded in the rationalisation and abstraction of work processes. The survival of the organisation was no longer dependent on the whim, competence or charisma of individuals. However, the rationalisation of the nature of work within an organisation translates into a rationalisation of administrative functions - all areas of the organisation are subject to the same principles. This rationalisation of administrative functions unerringly leads to bureaucracy as the foundation of administration (King, 1980).

The claim to technical superiority of bureaucratic administration rests on its orientation to impersonal rules that enhance its reliability and hence the calculability of its operation; of the expertise of its officials; and of the development of a system of authority relationships that is practically indestructible. For a society administered by a bureaucracy, the conduct of public affairs depends upon expert training, functional specialisation, and coordination of a bureaucratic administration with its uninterrupted performance of the manifold tasks that are regularly assigned to the modern state. The bureaucratic form of administration is both permanent and indispensable; because not only do the myriad of employees have a vested interest in the continuance of such an organisation, but also because the complexity and specialisation of the tasks performed by the organisation put them outside the scope and grasp of any other administrative arrangement (Bendix, 1962). Once established bureaucracy is there to stay.

Bureaucratic administration is essentially administration by experts.

Equal eligibility for administrative appointments means in fact equal eligibility of all who meet the stipulated educational requirements. Educational diplomas have replaced privilege as the basis of administrative recruitment, just as scientific education and technical expertise have replaced the cultivation of the mind through classical literature and the cultivation of manners through competitive games among social equals. The expert, not the cultivated man, is the educational ideal of a bureaucratic age (Bendix, 1962, 430).

The superiority of bureaucracy as a form of administration would appear to be assured. However, this was not what Weber was intimating when he referred to the inevitability of bureaucracy. What he was concerned with was bureaucracy as a particularly efficient form of organisation for *political purposes* because it kept the organisation together. The survival of the organisation was again at the forefront of his concerns. The development of bureaucracy does not stop the struggle for control, it transfers it to a new arena which creates certain advantages for the bureaucrats. Thus, a tendency towards bureaucratisation, as control, is an inevitable trend in all areas of direct government concern (Albrow, 1970). How much more so in the area of education which comprises such a major part of government political responsibility?

Whereas the functioning of the administrative responsibility of society is dependent on the possession of expertise, the institutionalisation of expertise within society has been associated with the development of professionalism. Professions play an important role in the regulation of modern society in two ways. Firstly, they provide a vehicle which the middle class can utilise in their efforts to achieve realisation of aspirations for social recognition. The tendency for all middle class occupational groupings to aspire to professional recognition is in itself a confirmation of this role.

Secondly, professions provide an opportunity for the middle class to become involved in the political process, thereby encouraging them to identify with the actions of government and in the process helping to dissipate any political dissatisfactions. Professions allow governments to cede major responsibilities for certain areas within society that are necessary to that society's proper functioning. In so doing governments

rely on the social institution of professionalism to ensure that this responsibility is capably and efficiently discharged. Medicine, law, and engineering are readily recognised professional occupations, but many other areas, to a greater or lesser extent, are regarded as professional - the clergy, academia, and teaching are a few of many possible examples.

Professionalism emerges from the institutionalisation of expertise by modern societies. Thus, it relates to the work that a profession performs (Abbott, 1988). However true professionalism is only realised within a societal context. Professions ultimately depend upon the power of the state, since it is through the state that the legal functions that underpin the monopoly of a profession are attained. By acts such as establishing accreditation boards and recognising professional associations the state confers on one group of protagonists the societal legitimation that is essential to enable a profession to claim jurisdiction and to attain social status (Larson, 1977).

However, the state has a predilection towards bureaucracy. Thus when the interests of the state and of the professions coalesce it is the professions which are under greatest pressure, for not only is their legitimacy guaranteed by the state, and thus they are potentially vulnerable, but also the state has the advantage of the bureaucratic apparatus in the struggle to ensure that its will is imposed.

The making of curriculum is portrayed as professional activity. Responsibility for curriculum development has thus been entrusted to professional groupings (Goodson, 1988). However, in recent times the state has assumed an increasingly proactive role in the propagation of curriculum. Increasing conflict with the professional organisations would appear inevitable.

A Brief Case Study of Curriculum Change

The Victorian senior mathematics curriculum provides a particularly interesting case for exploration. Victoria began as a colonial state and has evolved to a modern democratic society. All this has occurred during the past two hundred years and has been substantially documented. Clearly substantial change has occurred throughout this period and thus many of the explanations of change proposed by Weber would be relevant. Weber, however, paid only scant attention to education, so the Victorian case provides an opportunity to examine the ideas of Weber, particularly as they relate to bureaucracy and professionalism..

The emergence of public education spanned a period stretching from the eighteen thirties to the nineteen sixties. Victoria began as a colonial society, and, not surprisingly, many of the influences of colonialism were evident in the social institutions, including education, of the emerging society.

Secondary education, in particular, owed its origins to its European forebears, and, as a fledgling colonial government struggled with challenges of civilisation and democracy, in the face of a harsh and formidable environment, both physical and political, it was left to private secondary schools and the university to construct the edifice which was to constrain the growth of public secondary education throughout the early twentieth century. Responsibility for secondary curriculum devolved to the traditional authority of the university professoriate, and an alliance between the university and the private registered schools ensured that this responsibility remained intact until well into this century (McCallum, 1990). Thus, secondary mathematics curriculum was constructed as an academic curriculum, and students and teachers alike were forced to cope with a curriculum that was primarily designed as preparation for university studies.

By the nineteen sixties classroom mathematics teachers had begun to express public opposition to a curriculum that was in no way appropriate for their students. Their voices were joined by others across the educational spectrum as educationists united to mount a challenge for control of the curriculum. Education had begun to emerge as an area of professional concern.

By the turn of this century education had become a major enterprise and the Victorian government initiated moves to regulate its provision. As the demand for

education grew throughout this century so did government involvement, but so also did the numbers of those with a professional interest in education. The elevation of education to professional status within the university, combined with an emerging discipline of psychology and an embryonic philosophy of education, provided the basis for the acceptance of education as a legitimate discipline. Professional recognition, however, had to await the work of Piaget, whose reconceptualisation of the learning process provided the intellectual infrastructure that enabled educationists to propose a new conception of the meaning and purpose of education. Thereafter, professional educators, mathematics educators among them, embraced the challenges posed by this new conception of education which treated the child as an active participant in its own learning process. This conceptual transformation entailed the redefinition of mathematics education, which effectively laid the foundations of the discipline of mathematics education. A new professional grouping was constructed, and from deep within the educational fraternity, a successful challenge was mounted to assume control of the secondary curriculum.

The expansion of educational activity certainly had an impact on the practitioners in the classroom, but it also had an impact on government. Over recent years government has displayed a renewed interest in the processes of schooling. In particular, an increased focus on the role of education has been seen as one way of addressing wide ranging problems within society at large, such as youth unemployment, changed work patterns, and a declining economy. Education is a large budget item, and governments sought greater accountability for the increased economic outlays. To a large extent this manifested itself in greater government intervention in the outcomes of schooling (Horwood, 1997).

In the end, government chose the path of direct intervention - an inquiry into the purposes of the postcompulsory years of schooling within Victoria led to a reconceptualisation of the purposes of education and to the propagation of a new curriculum. The growth of administrative function normally goes hand in hand with government intervention and education proved no exception. Successive state governments oversaw the transfer of responsibility for secondary curriculum to the welcoming arms of government bureaucracy, and, in the time-worn traditions of bureaucracy, responsibility for curriculum expanded to embrace all years of schooling.

Conclusion

It is in the nature of the state that it appropriates all areas of primary concern, both as a protective mechanism and as a proactive one (Foucault, 1982). Education was one area of particular importance to which attention was directed. Control of primary education became a government responsibility in the nineteenth century, but the traditions of secondary education were much more resilient. In part this was due to the lack of popular demand for higher education, but it was also due to the entrenched authority of the professoriate within the education system and to a tradition of education that valued the cultivation of old world values above the needs of an emerging society. To early colonial society education provided a means to prestige and privilege so that prestige and privilege became enmeshed with the purposes of education. In this way the system of authority became interwoven with the social system in which the organisation operated, thus strengthening the resistance of this authority to challenges from others within the society.

This traditional authority prevailed until well into the twentieth century despite the fact that voices of radicalism and of democracy were pressing for the direct participation of government in the control of curriculum. In essence the demand for the state to assume control of education is a demand for a rational-legal authority as the basis for curriculum. For the process of impersonalisation that accompanies this transition is viewed as a means of ensuring that all can share equally in the privileges accorded by the state. The early attempts to wrest control of curriculum from traditional authority met with quite substantial resistance as entrenched interests within the society rallied to repulse the initial attempts to broaden the charter of secondary education.

However, the state has several means at its disposal by which it can attempt to exercise control over the essential processes within the society. One such means is legislation, and in creating an examination board in the early years of this century the state effectively laid the foundations for its eventual triumph in the area of control of curriculum. However this victory was not to come easily. For the first half of the twentieth century an alliance between the university and the registered school system managed to maintain control of curriculum and hence to mould the process of secondary education that was to evolve throughout those years. The only major threats to this system arose from the onset of mass education - in other words, the democratic demand for equal education for all, and the increased demands for specialisation, and hence professionalisation, within the society.

Curriculum was initially accepted as a proper jurisdiction for the university professoriate. The only model that was provided for secondary education was a traditional one imported with the early settlers. Professors were experts in matters of knowledge, and hence, of education. However the growth of democracy provided a challenge to traditional authority. This challenge took the form of professionalisation, since professions constituted an expression of democratic authority - a single figure of authority was replaced by the authority of a group.

Professionalisation, on the one hand, led to mathematicians eschewing direct control of the secondary curriculum, and on the other, to educationists claiming curriculum as their jurisdiction. The nature of the education profession is, however, somewhat diverse. It embraces a range of careers from teachers through to academics. The differentiation of the education profession entails that the determination of curriculum is, even within this profession, a highly contested arena. This allows the possibility that control of curriculum could be the preserve of a privileged subgroup of the education profession. Such a result would not be tolerable in the face of demands for the democratisation of curriculum. The implicit logic that lies at the heart of democracy eschews the notion that one particular person, or group, should be privileged at the expense of the others. Thus support is readily won for the institutionalisation of curriculum control. However, government control entails bureaucratic control. Professionals acquiesce in their own demise.

The situation in Victoria illustrates that the path to democratisation of a state inextricably involves the state on the path towards control of curriculum. An inevitable victory is not necessarily assured, except so far as to say that the enormous resources involved in the provision of a comprehensive educational system are generally available only to the state. However curriculum extends well beyond the provision of physical resources. Curriculum is central to the definition of knowledge and the accessibility of that knowledge to different groups within the society. The inevitable bureaucratisation that accompanies state control poses a threat to certain groups within society because it is the nature of bureaucracy that it cannot make allowance for the treatment of individual cases. Implicit in bureaucratic control is a particular notion of knowledge and particular interpretations of its accessibility. Thus, at core, bureaucratic control threatens the very democratic basis on which this control is predicated.

The current situation in Victoria clearly reflects the influence of bureaucratic control on the nature of mathematics curriculum. A curriculum has been propagated throughout years P-12 that treats content as non-problematic and in which attention has been focused on assessment and moderation. The use of external moderation procedures are, in the first instance, ostensibly designed to guarantee the equitability of the assessment procedures, but they have the added effect of providing a means for constructing teaching in terms of quantifiable outcomes and external objectives. One consequence of this approach is to diminish the role of the teacher in the definition of curriculum, and hence in the determination of the outcomes of schooling. Clearly the nature and purpose of education is being redefined but it remains an open question as to whether this redefinition is the proper responsibility of mathematics education administrators.

Bureaucratic control of education is not the sole preserve of democracy. Other political systems develop bureaucratic structures to control education. Some, in particular, are much more insistent about government control of curriculum than is compatible with a democratic rationale for a state controlled bureaucracy to oversee curriculum. This points to the fact that at the heart of control is a purpose. One such purpose might be the preservation of the institution. *However, for democracy one purpose is to ensure that the outcomes of education are accessible to all in equal measure and regardless of socio-economic situation.* Thus we need to be ever vigilant that the control arrangements that we have in place are such that all can continually aspire to that ideal. Bureaucracy is, in essence, an administrative form and thus the bureaucratisation of curriculum entails a redefinition of curriculum and, consequently, of teaching. Such redefinitions are currently clearly in evidence with respect to mathematics education within Victoria. Resistance to the bureaucratic control of curriculum can be expected to emerge from practitioners in the schools, and from others who feel marginalised by the definition of knowledge implicit in bureaucratic control, as these redefinitions force teachers and others to make accommodations that are unacceptable. The struggle for control of the mathematics curriculum continues.

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