ACCESS: CONTEMPORARY ISSUES IN EDUCATION
2000, VOL. 19, NO. 1, 15–27

ACCESS

Human capital theory and the economy

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ABSTRACT
The version of human capital theory that underpins the education reforms assumes a direct linear relationship between education and national economic performance. Education is seen essentially as a productivity enhancer. Policy makers' assumptions that education is primarily a private good are examined, along with theories proposed as alternatives to human capital theory, i.e. screening theory and credentialism. We suggest that, while education is necessary for improved economic performance, it is not of itself sufficient, and that there are a number of workplace-related issues which impact on the ability of the workforce to apply their human capital effectively and efficiently.

Introduction

This paper initially summarises key ideas from mainstream neoclassical economics that emphasise the link between human capital and economic growth. It argues that these ideas appear to underpin explanations for low productivity growth in New Zealand, without perhaps adequate consideration of other factors that might impact on productivity and economic performance. Importantly, the link between education and economic performance appears to assume a direct linear relationship without sufficient account of other factors that may contribute to workplace productivity. This paper therefore highlights some management and organisational considerations that have a significant productivity-enhancing role. Attention is also drawn to alternative theories that suggest that education plays an altogether different role to the mainstream view of productivity improvement.

At the outset we stress, however, that it is not the intention of this paper to suggest that human capital is not a vital contributory factor to an economy's success. Thus for instance an important theme in the literature of economic growth has been the attempt to explain why some countries achieve higher levels of productivity and others lag behind. Examining elements influencing the potential of different countries to raise their productivity and catch-up to productivity 'leaders', Abramovitz (1986, 1994), highlights the importance of 'social capabilities'. Rising levels of education involving education of the general population, the availability of a sufficient body of competent engineers who could discover, acquire and effectively use modem technology and enhanced experience of businessmen in large scale production and corporate organisation; are indicative of general changes in social capability that release the potential for catch-up (Abramovitz, 1994:39). We certainly support this view that elements of human capital are vital to building social capability of a nation. Similarly, we recognise that building New Zealand's skills base is of considerable importance in the new global era of the information, technology and biotechnology revolutions and where occupations requiring higher levels of education, particularly in the service sector, are

experiencing rapid growth while unskilled and semi-skilled occupations, chiefly in the manufacturing sector, are declining significantly.

The human capital – Growth relationship

Traditional neoclassical growth theory showed the 'residual factor ' or total factor productivity growth, which is output growth unexplained by additional labour and capital inputs, to be of importance in affecting long-term sustainable economic growth (Solow, 1957). Schultz (1961) showed that improvements in the quality of labour through education was vital in explaining growth in the United States which was 'unexplained' by conventional factor inputs. He argued that the return on investment in human capital was at least equal to if not higher than the return on investment in non-human capital. With 60 per cent as the measure of residual growth between 1929 and 1956, Schultz claimed that 30 to 50 per cent of this residual represented the return to increased education. Bowman (1964) too confirmed earlier work by Schultz and Denison on the importance of the contribution of education to growth. Bowman (1964:450) distinguished "units of inputs of productive services derived from "'embodied education"' as "Eds", with human capital as a stock and Eds as flows. Refining earlier calculations Bowman (1964: 459) argues that Eds would have contributed around 18-19% to national income growth over the period 1929 - 1956/57, in the US.

More recent growth accounting studies for a cross section of countries, suggest that improved labour quality resulting from education accounts for up to 25 per cent of the rate of growth of national income, with the average growth contribution of education being just under one-tenth (Pscharopoulos, 1984). Education contributes to growth for instance, because the adoption of embodied technology (new inventions) and disembodied technology (more productive ways of combining given factors of production), is more efficient in more educated societies (Machlup, 1970).

New endogenous growth theory or new growth theory endogenises human capital formation and technological change, which were exogenously determined factors in the neoclassical growth model. Human capital becomes a key contributor to sustained per-capita output growth. The new growth theory serves to emphasise the role of human capital in enhancing technological progress and productivity (Romer, 1986; 1990).

There can be no doubt that human capital improvements have a significant influence on growth performance. Nevertheless the caveat assumptions that McGrath notes is well worth highlighting at this point:

> this widespread faith in education is based on several assumptions... the changing structure of the (American) economy and advances in technology raise the average skills required by workers in their jobs... the education system is the most important source of skill development in modem society ... the skills workers bring into the labour market will enhance their productivity in the workplace, benefit workers, employers, and the nation. In short, these assumptions suggest a positive and direct relationship between education and work (McGrath, 1983:1).

The notion that education directly enhances productivity has been taken on board in New Zealand, seemingly uncritically and without due regard for complementary factors that influence a nation's productivity and growth record. Illustrative of the popular standpoint that education is the universal panacea for the nation's ills is the following statement from the introductory address to an important quasi-governmental national education conference:

> There is now, one can pretty confidently say, widespread recognition that a major upgrading of our performance in education is crucial to arresting our relative economic decline and at least allow us to remain within reach of the world's most advanced societies (Stewart, 1992:3).

The highlighting of the role of human capital in improving New Zealand's productivity and international competitiveness is a common strand running through several government sponsored

reports. These include Watts et al. (1987); Probine: Fargher (1987); Crocombe et al. (1991), OECD economic surveys of New Zealand (1993, 1996); as well as other researchers (e.g. Ball, 1991), in the latter part of the 1980s and early to mid 1990s. Thus for example, the Watts Report (1987), which focused on the university sector states, "increasingly, the world is knowledge-based and economically competitive. Rapid economic, technological, social and cultural changes are taking place. In such a world, the functions performed by the universities (include) developing human capital through higher education ... " (Watts et al., 1987: xiv). Similarly, the Probine: Fargher Report which focused on the management and funding of technical institutes and community colleges, stressed "the driving forces for change . . . are manifested in those nations with higher levels of education, higher levels of skill formation and higher technology systems" and " ... we see the technical institutes and community colleges playing a key role in contributing to the economic growth and productivity of the nation" (Probine & Fargher, 1987:8,17). Endorsing the belief in human capital theory as a foundation for economic improvement is the Ministry of Education's 'Skills Training' Working Party Report:

> There is a substantial amount of international evidence that wealth generation in the most developed economies of the world is increasingly dependent on successful human capital formation (Ministry of Education, 1991:xx)

Perhaps the following statement from the 1996 OECD *Economic Survey of New Zealand* may be seen as epitomizing the view of the direct relationship between human capital deficiencies and productivity:

> The highest priority should be given to the need to improve the skills and competences of the workforce. This is an area where New Zealand lags behind other OECD countries, and which is to a large degree probably responsible for its poor historical record of productivity growth (OECD, 1996:61).

In fairness to informed debate however, it must be pointed out now that an earlier OECD Survey (1993:100) refers to workplace 'management' in tandem with skills, and indicates that the quality of New Zealand management is low relative to a number of other, more competitive countries. We take up this OECD management imperative and related management issues in subsequent sections of the paper. The next section of the paper investigates further the critique of the notion that education per se is associated with productivity increase.

Education as a productivity enhancer?

There is no automatic link between an individual's or nation's stock of human capital and productivity. In this connection it is valuable to highlight once again the insights of McGrath (1983:2) who notes that:

> the assumption that education enhances production is rarely questioned. Most observers believe that the knowledge and skills students acquire in school - what economists have labeled human capital - makes them productive workers. The more education individuals acquire, the more productive they become and the more earnings they receive. Yet recent evidence questions these assumptions - test scores, a more direct measure of educational skills, show a rather weak impact on earnings. In addition, productivity growth in the US economy has declined despite the population's rapidly increasing education levels.

The link between education and productivity may be tenuous. Although Psacharopoulos (1984: 341) suggests that education "enhances the adoption and efficient use of new inputs such as technological innovation", he offers no evidence for such an all-encompassing statement. His views are challenged by Marginson who states, "it cannot be emphasised enough that education does not in itself create productivity. Productivity depends not on the intrinsic human capital 'embedded' in individuals but on the concrete uses to which skills are put" (Marginson, 1993:128). He also suggests "the (Australian) government's higher education policy is purely a supply side one. It hopes that by

increasing the supply of graduates, the demand for graduate labour will increase more or less automatically; that better labour will attract capital investment like moths to a flame" (Marginson, 1993: 129). An expansion of the educated labour force is likely to lower the earnings of that cohort, due to greater competition for the same jobs (the demand for educated workers being unlikely to spontaneously increase), as noted by Hammermesh & Rees (1988:76) unless there is at the same time increased job creation in the high-skilled sector. Further exercise of caution regarding the limits of 'skills' in contributing to productivity, is urged by Henderson (1991: 7) who also draws on the Australian experience to note "alone'. additional skills acquisition will contribute only marginal productivity gains. The real gains derive from Job redesign and organisational restructuring". Specifically, he suggests that traditional organisational structures based around mass production techniques and hierarchical management structures are a far more significant factor in inhibiting productivity than levels of skills within the workforce.

Furthermore, government policy developed from the predominant focus of the creation of skills and not on the maintenance of these skills over time is fundamentally flawed. Almost four decades ago Schultz (1961:13), observed that "human capital, like other forms of reproducible capital, depreciates, becomes obsolete and entails maintenance". He noted that tax structures did not reflect this consideration by providing rebates for retraining or upskilling. Over 30 years later generally tax structures have not been modified to provide incentives for retraining and, despite a growing literature on the subject of recurrent education, consideration of ways of combating skills obsolescence do not appear to feature as a major consideration in government policy. Government policies in the post-1984 reform era in New Zealand, largely ignore retraining and recurrent education. They also appear to ignore the technology/worker interface as well. The human capital model hitherto used by New Zealand policy makers could thus be extended to incorporate these factors. We also concur with Sweet (1989:136) who suggests that there needs to be a new approach to the link between skills and productivity. He identifies the characteristics of this approach as incorporating:

- a closer integration between general and vocational education
- a better focus upon skill development in the workplace and upon links between work and education
- a focus upon the retraining needs of existing workers as much as upon the initial education and training of workforce entrants; and:
- a focus upon interactions between technology, work organisation and skill formation.

Some alternative theories

Screening theory or signalling theory suggests that employers do not regard qualifications as valuable in their own right as indicators of specific knowledge and skills. Rather, employers use them as a screening device to sort prospective employees especially in the absence of other information. Qualifications signal to employers the capabilities of workers (Spence, 1974). If education has any social value, "it is as a signalling device which helps to place the right man in the right job" (Layard and Psacbaropoulos, 1974:985). Rejecting the notion of human capital theory outright, Arrow asserts that:

> Higher education . . . contributes in no way to superior economic performance, it increases neither cognition nor socialisation. Instead, higher education serves as a screening device, in that it sorts out individuals of differing abilities, thereby conveying to the purchasers of labour ... (Arrow, 1985:18)

Management theorists Ohlsson & Nilsson (1984:10) support the notion that productivity is not directly related to education, suggesting that "the productive capacity of the individual has been identified but their productivity may not have been increased". The potential implications of this are summed up by Kroch and Sjoblom (1994:157) who suggest that, if education is human capital, "the

economy has benefited greatly as the stock has deepened since human capital formation is an important means towards economic growth". If education is purely a signal, growth in the economy's stock of education has not increased the productivity of the workforce and therefore more resources are being devoted to rent seeking with no gain to the economy. Thus, if signalling was to prove a dominant theory, there would appear to be justification for the proposal that students should meet the bulk of the cost of their own education. The theory is not, however, a dominant part of current government policy and some reports (e.g. Watts Report, 1987:3) seem to focus on human capital theory as the base for post compulsory education and to disregard the possible contribution of signalling theory.

Policy makers acknowledge screening theory as a potential factor, but not necessarily as strong a factor as is human capital theory. For example, Treasury, a primary supporter of human capital theory, sees education providing not only specific skills but also a screening function, stating that:

> the economic function of education evidently looms large at tertiary level. Different types and levels of certification are a pathway to different types and levels of jobs.... Certification (in general rather than vocationally specific courses) is certification of the ability to be trained and to study to that level rather than the possession of any particular piece of knowledge (NZ Treasury, 1987b: 163)

Thus the acquisition of specific qualifications and skills may not be of value in its own right as a 'certification' of competence but rather a signal of potential performance and 'employability'. "Educational credentials act as surrogates for qualities which employers regard as important, predicting a certain level of job performance without, however, making any direct contribution to it" (Blaug, 1985: 51). Hence "a university degree or a secondary school diploma may function more as a certificate of diligence and perseverance than as evidence of particular verbal and mathematical skills" (Blaug, 1970:30).

If screening theory were a dominant factor, then the current emphasis on aspects of human capital development in current government policy would appear to be misplaced and potentially, a considerable investment in vocational education and training could also be misdirected. The evidence of researchers such as Kroch & Sjoblom (1994) is however that human capital rather than signalling is the predominant explanation of schooling's value. This view supports earlier work by Layard & Psacharopoulos (1974).

Even allowing for screening to be incorrectly identified as the dominant function of qualifications acquisition by writers such as Spence (1974) and Arrow (1985), the theory still appears to hold some influence. The consequences of screening theory being used by employers are serious, particularly when coupled with the discriminatory nature of age related, dual student fee structure (Study Right versus Non Study Right) which operated in the tertiary education sector. If employers use educational qualifications as indicators of 'desirable attributes', it should have become more desirable to obtain a qualification. But mature students incurred a financial penalty through the Study Right scheme. Not only has it cost them more to undertake their studies, but they have fewer years in which to recoup, via income subsequently earned, the investment they have made in order to obtain the qualification. This may have led them to do shorter, lower level qualifications, possibly restricting their future employment or promotional prospects. Certainly the use of formal educational qualifications merely as a screening device could lead potentially to serious losses to the economy for " ... in a job market increasingly controlled by the signals provided by educational qualifications, the unqualified or less qualified may be screened out so as to not receive serious consideration from prospective employers, even if they have worthwhile skills and experience to offer" (White, 1988:5).

Closely related to screening theory is the theory of credentialism.

> Credentialism occurs when the qualifications needed for entry to an occupation are upgraded but there is no commensurate change in the skill and knowledge requirements of the job (Kirby, 1986: 112).

Critics of credentialism argue that it has a major flaw when related to higher educational systems:

> Worse than screening is credentialism, where university provides a passport into good jobs, without even accurately signalling higher productivity, (Keep and Maynard, 1988: v).

It is possible that the current economic situation has led to people obtaining pre-employment qualifications in the hopes of gaining employment. There is evidence to support the suggestion that this is so in Australia (e.g. Karmel, 1993). These people may be seeking to signal their inherent productive capacity with the firm "assessing production capacity on the basis of the cost structure and not on the basis of the contents of the education" (Ohlsson & Nilsson, 1984:8). Caution about the potential discriminatory effect of policy must also be exercised since a person's "choice of education is further taken to be made on ceteris paribus assumptions i.e. the possibility of financing the education is the same for everyone" (Ohlsson & Nilsson, 1984:14). It may in fact not be a deliberate policy, but rather an unintended side effect or latent function of the education decision process.

This raises a number of equity issues, both regarding access to education and to employment itself. Brennan et al. (1993:6) raise concerns regarding the potential for inequality via discrimination in the use of such theories. They propose that:

> if as it has been suggested, employers are interested in qualifications on the grounds, not so much of them being indicative of the possession of relevant knowledge and skills as their being useful as a 'screen' for filtering the socially acceptable, then extended educational opportunities may not lead to extended employment opportunities.

Treasury's 1984 *Economic Management* report acknowledges credentialism as a potential factor, but appears to limit its influence largely to the established professions:

> The supply of education can also distort supply and demand conditions in particular segments of the labour market by giving rise to barriers to entry (particularly in the major professions) which artificially restrict participation on various activities (NZ Treasury, 1984:268).

A study from Australia cautions against credentialism, but does not restrict its focus to the extent that Treasury has. Ashenden (1992:246) notes that:

> it also needs to be remembered, however, that formal qualifications have other consequences. If they can help in finding, selecting and promoting employees, they can also make these decisions slow and discriminatory.

Ashenden suggests that they can help to establish occupational monopolies, which reward membership of the club rather than (or as well as) real and needed skills. Over time, occupations and individuals compete with one another to get higher status qualifications, and therefore demand longer and more abstruse courses of study (credential inflation) as the price of entry.

A consequence of this would be that education resources are wasted and, worse, distorted as the link between workplaces and learning places grows longer and thinner. Extra educational resources go to those at the top of the tree rather than to those lower down Ashenden further warns that the core idea of 'skill' (or competency) may be pushed aside by other elements of the agenda and particularly by career and training paths which, as currently conceived, link directly into a powerful and long-established credential system driven by competition between occupational groups struggling for advantage in the labour market. "This would strengthen the connection between education / training and the labour *market,* not (as was intended) the labour *process"* (Ashenden, 1992:247).

Should either screening theory or credentialism prove to be significant, there would be substantial implications for education policy makers. The model of education decision-making would require revision and the implications for equity would also require reconsideration. In addition, the potential for occupational monopolies to capture the education process should also be considered.

Are education reforms alone enough? Some comment

It is clear that the reforms being undertaken in education are expected to have significant impact on the country's productivity and economic performance. This view may be somewhat naive. Keep & Maynard (1988, vi) cite a comparison of British and West German performance that concluded that while manufacturers in the two countries had "access to the same machinery and work markets, the German workforce was more qualified". They suggest that the inevitable conclusion that "the direction of causation ran from training to success" may be too simplistic. "Insufficient account may have been taken of the many other factors that intervene in the relationship between investment in education and training and the resulting returns in the form of increased performance" (1988:iv). They further caution that: "to break into the explanatory circle by picking out just one variable for consideration will yield misleading results. For the same reason, to construct a policy which attends to just one variable is likely to be ineffective" (1988:vi).

Among other variables, they suggest the inclusion of methods of work organisation. They note (1988: vi) that "the traditional aim of British industrial relations, put simply, was to extract compliance from the workforce, rather than to seek their active commitment to shared goals". They then contrast the 'hierarchical and authoritative management structure' of the British system with the management / worker co-determination and social partnership of competitors such as West Germany and Sweden (op cit). This is not to suggest that education itself is thus unimportant, only that the effectiveness of educational reforms may be constrained by other factors. As Ball (1991:8) notes, "Though not by itself a sufficient condition, a world-class workforce is certainly a necessary condition for national economic success".

The 1993 OECD Economic Survey of New Zealand, in noting the decline in economic competitiveness relative to other countries, isolates management structures and performance as a factor to be considered. In particular they cite the rigidities of current management practice as a limiting factor on economic performance, noting that "a highly qualified workforce, even when it is matched by up to date equipment, will not reach its potential unless the tasks that workers carry out are organised by appropriate management performance" (OECD, 1993:99).

In their comparison of management factors between New Zealand and other countries, the following extract provides a useful indication of performance relative to other countries. Table 1 shows the percentage of respondents agreeing with four separate statements on management factors within each of five countries.

Table 1: New Zealand Management factors relative to other countries:

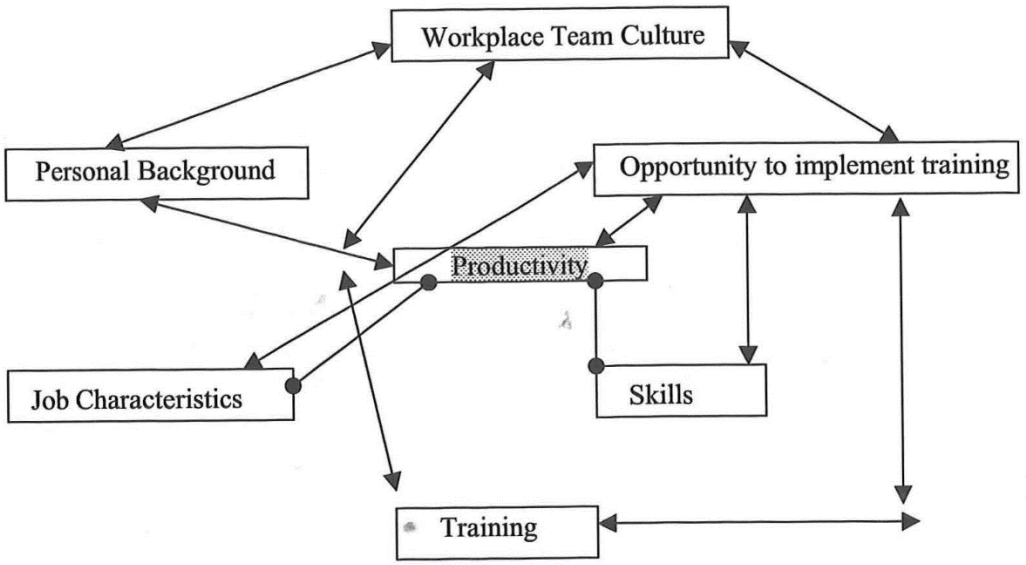
New Zealand	United Kingdom	Sweden	Germany	Japan
Extent to which there are enough competent senior managers on the market				
48	44	60	58	57
Sense of entrepeneurship and innovation of managers				
51	54	66	68	67
Degree of experience in international business of senior management				
55	58	73	70	59
Degree of understanding and knowledge of foreign cultures and languages				
45	39	70	66	56

Source: The World Competitiveness Report, in OECD (1993:100)

Forwood & Griffin (1993:5) note that "training alone is not argued to be the sole key to increased productivity. Moreover, the development of skills through training is recognised as an insufficient

condition for productivity increase, even if there is an appropriate climate for training". Training seems to be a necessary but not sufficient cause of changes. They suggest that there are a number of factors that influence productivity both directly and indirectly. The relationship of these factors is shown in Figure 1.

Figure 1
Proposed Direct and Indirect Relationship between Factors which Influence Productivity.



Key: direct influence
indirect influence
Source: Adapted from Forwood & Griffin (1993: 7).

Page et al. (1994:85-86) suggest that New Zealand management tends to regard training as a peripheral rather than an integral component in organisations, primarily because of the way it "seems to respond relentlessly to professional fads", but also because the release of a manager for a period of training, in addition to the costs incurred, may significantly impact on a department's work programme and budget. Thus the long term 'return on investment' potential from education and training for employees seems to be overshadowed by a short term immediate cost/impact focus. This may in part explain why New Zealand management has been regarded poorly when compared with other countries.

In the final analysis however, it must be stated that the measurement of New Zealand's productivity itself, let alone separating out the impact of education and training on productivity, suffers from a lack of good statistical data (see for example Diewert and Lawrence, 1999). What is also a fact that must be faced, is that New Zealand's productivity growth has been quite dismal since 1991, with productivity growing at just 0.25% per year, compared to Australia's rate of 1.74%, between 1991-1999 (Maloney, 1998:104). While there is no consensus on the cause of the slow down in productivity, with evidence that shows that factors such as unionisation of workers contributes positively to productivity (Maloney, 1998), there is also an inference that the education reforms have not contributed in any significant fashion to productivity growth in the economy during the period.

Industry training

Firm level training and experiential development is considered essential to competitive advantage (Boxall, 1995: 29). A related piece of legislation is the Industry Training Bill. The NZ Engineers Union (NZEU), one of the largest unions in New Zealand, suggest (1992:34) that it too will have an adverse effect, possibly an actual decline in New Zealand's relative skills base and international competitiveness, as "training markets in New Zealand will rapidly devolve even more into internal markets. At the low level of skills currently existing in the workforce, with considerable disincentives impacting on both employers and individuals to pay for training in higher skills".

The NZEU (1992:2) points out in their submission on the Industry Training Bill that "an extensive random survey of our total membership, conducted in 1988, showed that the majority of workers polled had not received any *new* training on their job since their employment", Boxall (1995:30) is critical of the lack of long term investment in training, noting that the more buoyant labour market of the mid 1980s saw employers 'predictably' complaining about shortages of skilled workers. The faults perceived by critics of this legislation actually reflect a long standing mixed record for New Zealand employers in respect of skill formation. Boxall (1995:33) suggests that, while some companies commit resources to vocational training through recession and recovery periods, "others are more inclined to lay off staff in the recession and then 'poach' trained labour in the recovery". He also notes that many, firms are "free riders in the training arena", and are quite content to let the better firms shoulder a greater share of (training) costs (Boxall, 1995:33).

It is interesting to note that the OECD (1993) report (drawn from a study with a small sample which Campbell-Hunt et al. (1993:3) suggest used a biased sample selection procedures) shows that New Zealand performs significantly less well than countries such as Japan, Sweden and Germany on a number of 'indicators of the quality of labour', as shown in Table 2. This table shows the percentage of respondents agreeing with four separate statements regarding quality of labour in each of five countries. New Zealand's relative weakness on a number of 'competitiveness indicators' is evident.

Table 2: New Zealand 'quality of labour' indicators relative to other countries

New Zealand	United Kingdom	Sweden	Germany	Japan
Extent to which workers identify with company objectives (worker motivation)				
51	45	54	62	81
Degree of willingness of employees to learn new skills or a new profession (receptiveness to learning)				
58	51	64	60	77
Extent to which the education system meets the needs of a competitive economy				
42	30	50	70	69
Extent to which companies invest sufficiently in training their employees				
50	41	65	72	82

Source: The World Competitiveness Report 1992 in OECD (1993:100).

The financial troubles experienced by a number of Industry Training Organisations (and the mergers of what appear to be disparate organisations such as the Food and Beverage ITO with an Engineering ITO in March 1997) must give concern regarding the level of commitment to the educational reforms from industry and the ongoing financial viability of the mechanisms instituted to oversee workplace based education and training in particular. Lack of funding may severely curtail the amount of training available in the future. These factors, coupled with the shortcomings in both workplace management / organisation and in the commitment to training within industry, indicate that there may be major barriers to the successful implementation of the education

reforms. New Zealand's low relative 'quality of labour' indicators may therefore continue in the future.

Need for management reforms and stable government policies

Management theorists Mishel & Voos (1992:290) provide the following caution: "Technology makes new organisation of production possible, but competition makes them necessary". They continue:

> A number of features in high performance production systems encourage worker participation. For one thing, these systems require better educated, skilled workers who are less tolerant of monotonous, routine work and authoritarian managerial controls" (Mishel & Voos, 1992:292).

Should the workplace-based component of the education reforms not succeed, there is a danger of reversion to old systems rather than of trying to rescue the reforms. Mishel & Voos illustrate the problems of less than total managerial commitment to workplace reform in tandem with technological reform by reviewing problems encountered by General Motors in Detroit in the mid 1980s. They note that, having introduced "team organisation along with advanced technology" (including new training for team organisation) ...

> ... as soon as production problems developed and managers felt the pressure from above to keep up steady production, they reverted to the old ways ... and management went back to ordering people around.

They further note that the plant became "a symbol for the failure of GM's advanced automation solution" (Mishel & Voos, 1992:236).

Should the ITO structures continue to experience financial difficulties, it is unlikely that individual firms will contribute substantially to the ongoing development and administration of the National Qualifications Framework. It is more likely that these firms will also revert to the 'old ways' and old education and training structures.

A British perspective is provided by Hyman (1992:173) who draws on macro economic policy debate by suggesting:

> it is recognised that steps to improve long term performance must receive assurances from government and support from financial interests for its future in terms of funding for investment and development. Pressures exerted upon industry for short term performance must be relaxed. A heavy responsibility rests upon government to create the conditions for controlled consistent growth. Reliance on market forces has not and cannot provide these growth conditions.

Shannon (1994:16) is critical of the New Zealand government's performance, from a macro perspective, in terms of commitment to training, proposing that:

> the framework may be in place but the needed work-based training is not, demonstrating that in the area of training and skills development, New Zealand is developing another bad case of quango-itis: too many pens, not enough hammers.

Boxall (1995:34) suggests that New Zealand industry attitudes have been reinforced by:

> capital market short-termism, historically deficient state leadership and provision for vocational training, and an all-too-easy resort to immigration rather than local human resource development.

Shannon argues that:

> it requires more than current government policy to make the most of growth opportunities in the economy ... for the future industry and government will have to find new, simpler structures on which to build a learning culture to take us into the 21st century or the new growth might just be part of the old boom and bust cycle of the past (1994:19).

These concerns are echoed by Lauder (1991) who maintains the current New Zealand education reforms are misdirected. He suggests that education has a key role as a source of technological

innovation and, as such, that "education is a crucial type of investment for the exploitation of modem technology". He illustrates his concerns by referring back to the government's aims for a high wage, high technology economy, suggesting that, while this implies a highly skilled workforce, the problem for New Zealand is that expenditure on all aspects of the economic use of knowledge is relatively low, not only for tertiary education but also for research and development and vocational training (Lauder, 1991: 15). When New Zealand's relative spending on tertiary education is compared to that for the rest of the OECD - New Zealand ranks 22nd out of 24 countries in terms of public expenditure in relation to GDP per capita, spending NZ$6,080 per student, compared to the OECD average of NZ$10,030, (OECD,1996). Given industry's lack of universal commitment to the education reforms, it is unlikely that New Zealand employers' spending relative to other OECD countries on workplace based education and training would be substantially better than the commitment to formal education and training.

Summary

The potential effectiveness of education may be constrained by a number of other factors impacting on workplace organisation and productivity. Research that has been used to indicate recent substantial improvements in New Zealand's management may not be empirically sound. It would appear that there is considerable scope for a more detailed investigation of the factors that influence the development and maintenance of an internationally competitive workforce and of the role that education may play within it.

It is important to determine whether the model of human capital as assumed by policy makers provides a complete explanation of the education decision making process and, if the model is deficient, to highlight factors which could expand and enrich it. The previous article took a macro perspective through the review of key theories underpinning the tertiary education reforms, the translation of theory into policy and then the implementation of that policy into practice. The following two articles take a more micro perspective and provide analyses of aspects of the labour market and of human capital in relation to ethnic minorities.

Despite the shortcomings and criticisms of individual elements of the education reforms in New Zealand, the entire process should ultimately be viewed from an overall perspective. The basic underlying reason for reform has been a need to provide for the necessary skills base in a knowledge intensive new technological era. Continuous review of the education system from early childhood care and education through to higher levels of learning is necessary in order to ensure a skilled and adaptable workforce that will meet current and future needs of high value-added industries.

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