

EDUCATION AND ECONOMIC DEVELOPMENT: A HISTORICAL LITERATURE ON RELATIONS BETWEEN HUMAN CAPITAL AND NATIONAL STRATEGIES

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Abstract

The relation of human capital development towards generating robust economic development is closely-linked in ensuring our country's progress are moving on the right track and to begin with, education aspect must be looked into. This could be seen as in the ninth Malaysia Plan that stresses on investment in human capital development. Therefore, this paper focuses on the meaning of human capital and its impact on the economic development, education and the national strategies. It is found that developing human capital is very much important indeed that prompted the government to give a due consideration towards this matter as the need to balance human capital development and the inner or spiritual strength of each and every Malaysian citizen is utmost vital. As outlined by the Prime Minister the balance was necessary especially from the aspects of adopting and maintaining high ethical values, which were important in Malaysia's bid to compete with both developed and developing nations.

Keywords: Human Capital Development, Economic Development, Engineering Education, Ethical Values.

Abstrak

Perkaitan antara pembangunan modal insan kea rah penjanaan perkembangan ekonomi yang baik adalah amat rapat dalam memastikan kemakmuran Negara dan aspek pendidikan perlu diberi perhatian. Ini dapat dilihat dalam Rancangan Malaysia ke-sembilan yang menekankan pelaburan terhadap pembangunan modal insan. Oleh itu, kertas kerja ini menyorot kajian perpustakaan tentang makna modal insan dan kesannya terhadap perkembangan ekonomi, pendidikan dan strategi-strategi nasional. Didapati bahawa pembangunan modal insan adalah penting yang perlu diberi perhatian sewajarnya terutama dalam hal yang berkaitan dengan nilai-nilai etika yang penting dalam proses persaingan menjadi sebuah negara maju.

Kata Kunci: Sistem Pengurusan Prestasi; Model Pengukuran Prestasi Berasaskan Nilai Teras (VBTPM)

1.0 INTRODUCTION

The Prime Minister of Malaysia stressed that the development of human capital was the hopes and wishes of the new generation, who would determine the government's efforts in realising its vision of creating a developed society and developed nation status by the year 2020 and to achieve success, Malaysia should strive to produce workers with integrity and knowledgeable in various fields such as science and technology. To develop the human capital, Malaysians must be fully equipped with knowledge, practice good moral values, have a big soul, love the country and possess the physical and spiritual strength. On top of that the central emphasis attributed to engineering education in Malaysia's contemporary economic development strategy reflects a much wider, international consensus on the transformative role of skills development in economic growth. The industrialized countries of the West, as well as those of East Asia, have all adopted strategies with respect to engineering education and economic development, albeit of different kinds and shaped by the specific circumstances of each national economy (Ashton and Green, 1996).

The question is thus raised as to whether lessons can be drawn from the successes and failures of these strategies, which may usefully be applied, to the very different circumstances of industrializing economies, such as that of Malaysia. Despite their differences, these strategies are underpinned by a common analytical framework: human capital theory. Accordingly, human capital theory and its relation to economic development are obvious. Human capital theory argues that investment in education and training contributes directly to economic growth at the national or regional level. It also claims that education and training will lead to advantages for individuals through improved earnings and career prospects. However, these arguments are strongly contested.

Nevertheless, the position adopted here is that human capital theory remains a useful framework, *provided that* other institutional conditions are fulfilled in order to bring about economic development. This part of the chapter provides a basis for the subsequent discussion of studies, which especially relate to the successes and failures of engineering education systems in developing industrial human resources in differing institutional contexts. Ashton and Green (1996) propose a general model embodying six conditions, which they argue to be necessary to achieving a high-skills development trajectory. These are: commitment by the state to develop a solid educational base; the provision of a high quality education system which aims to develop high levels of basic competence; the strong commitment and participation of employers; the need to form regulation in the process of skill formation; the willingness of workers to learn and continuous development at work; and skills deepening through off-the-job training. Clearly, these conditions are fulfilled to varying degrees and in different ways in real-world economies. Most industrialized countries, however, aim to pursue a high-skills route to maintain their competitive position in the light of technological and organizational transformations. In light of the above and in appreciation of the importance of engineering education in fulfilling industrial demands, the chapter then attempts to review the experiences of those countries which have vast experience of engineering education provision, so as to identify any successful features.

This review covers a number of Western industrialized countries, including the United Kingdom, Germany, France and the United States of America. The chapter further extends the review and examines the provision of engineering education in industrialized countries within the East Asian region, focusing particularly on Singapore, Hong Kong and Japan. The general implications for newly industrializing countries in Southeast Asia, particularly Malaysia, are also discussed. This wide review of different countries' provision of engineering education is needed in this paper in order to examine *general* issues in engineering education provision, such as employers' involvement in engineering education, state strategies to improve engineering education and ways of improving the employment prospects of students in engineering institutions. It is argued, in particular, that it is employers' involvement in engineering education, which constitutes the most essential institutional condition of effective links between engineering education and national economic development. The paper concludes by drawing attention to the importance of key assumptions - again based upon human capital theory - about the behavior of individual employers and (prospective) employees in labor markets in relation to the economic development strategies, which have been outlined.

2.0 HUMAN CAPITALS AND ECONOMIC DEVELOPMENT

Human capital theory in its contemporary form arose from the work of Schultz and his colleagues, Becker and Mincer, in the early 1960s. However, the basic concepts of human capital theory had been discussed in detail by Alfred Marshall in the late nineteenth century and by Adam Smith even earlier (Hoffman, 1986). The theory regards education and training as a key element in human resource development in fulfilling a strategy of economic growth. This was emphasized by Schultz (1971) in his statement:

The most distinct feature of our economic system is the growth in human capital. Without it, there would be only hard, manual work and poverty except for those who have income from property.

(Schultz, 1971, p. 47)

Human capital theory suggests that, on the one hand, individuals develop their capacities to generate incomes and improve career prospects through investment in education and on-the-job training, as well as health-care and other forms of reproduction. On the other hand, these individuals simultaneously enhance their contribution to national economic development. Hence, social investment in education and training is thereby justified as a means of promoting economic growth. Bearing this in mind, therefore, human capital theory has two dimensions, which are analytically distinct. Most attention in the literature has been devoted to the former dimension. However, it is the latter which is crucial to shaping thinking about the role of engineering education in economic development strategy.

Firstly, therefore, human capital theory relates to the behavior of individuals and stresses the importance of education and training, as well as experience, as a means of developing human capabilities, so that an individual may more easily gain access to employment and widen the range of choice available to them (Mincer, 1989). Education and training are also expected to improve the individual's chances of gaining higher earnings and higher occupational status (Hoffman, 1986). Hoffman's study in the US, for example, found that the more educated worker obtained higher earnings than the worker who was less well educated (see illustration in Table 1.1). This, it was argued, showed that education and training can enhance the individual's value within the labor market and help to obtain improved pay rates, increments and promotion (Ryan, 1981). In order to gain these benefits in the future, individuals therefore make economically rational decisions to invest in education and training.

As a simple example, education enables farmers to gain knowledge in new agricultural technology that may increase the productivity of their farms, and thereby increase their income (for example, Psacharopoulos, 1987a).

Table 1.1 Lifetime Earnings for Men According to Level of Education (based on study in the US)

Amount of Education	Assumed Rate of Productivity Growth	
	0%	2%
Less than 12 years	\$ 601,000	\$ 1,001,000
High school graduate	\$ 861,000	\$ 1,430,000
College graduate	\$ 1,190,000	\$ 2,062,000

(Source: Hoffman, 1986, *Labour Market Economics*, p. 158)

In human capital theory, individuals' access to education and training is assumed to be an important criterion in the labor market because it becomes the basis for the development of competence. This, in turn, enables individuals to demonstrate social and technical competences in carrying out occupational tasks (Hager, 1995). Education and training are also important in that they are often considered by employers as a tool for *screening* an individual's ability when selecting the best employees (Whitehead, 1981). According to Mincer (1989), human capital plays two roles; it can be a stock of knowledge which will become a source of technological change, and it is also a source of formation of adaptable skills in the workforce. Human capital models thus relate individuals' productivity with the amount they spend on self-development through searching for better education and training (Carnoy, 1977). Better education and training are believed able to develop a more employable person. As a consequence, the theory of human capital suggests that individuals and firms invest sufficient in education and training to reap these economic gains, which then off-set the costs of investment.

However, many analysts have disputed this view of the role of education and training in the functioning of labour markets. Although investment in education and training increases human value, such an investment also leads to the formation of different social classes of workers. In addition, it is argued that possession or otherwise of human capital can restrict the access of workers to a higher paying job (Loveridge and Mok, 1979). The theory of the dual structure of the US labour market is one example of this, with its emphasis on the discrimination which more often than not puts non-whites in secondary-sector jobs. These groups were claimed to have only limited educational opportunities, which caused them to have less chance to develop knowledge and skills. McKinnon and Ahola-Sidaway (1994) also found that the work that women did was often undervalued when compared to the work their men co-workers did. However, somewhat paradoxically, when women searched for more knowledge and skills to develop their professions, this development strategy helped them obtain higher pay.

This evidence of the reality of recruitment procedures in the labour market, therefore, tends to contradict human capital theory in its basic form (i.e. individuals invest in education and training in order to get better jobs with higher earnings). Here, it is emphasised that ethnic background or gender (or other social characteristics) may also play a part in recruitment procedures. However, there are considerable complexities here: it is seen, for example, that women who possess formal qualifications may actually overcome the experience of discrimination in the labour market. Nevertheless, it remains the case that numerous commentators have disputed whether people who have better qualifications do get higher-level jobs (for example, Berg, 1970; Collins, 1979; Phillips, 1990; Erridge and Perry, 1994). Berg (1970), for example, found that better educated non-white male workers in the US labour market obtained the same or even a lower income as lesser-educated white male workers in the same occupation.

In another study in a Mississippi textile manufacturing company, Berg discovered that educational achievement was actually negatively related to performance. This supports Collins' (1979) claim that education shows no clear contribution to individuals' productivity, because it is often irrelevant to the job requirements. Furthermore, education alone is not a warranty of employment (Phillips, 1990) because other criteria such as past experience and the individual's social characteristics are sometimes more important (Erridge and Perry, 1994). Finegold (1991) raises further difficulties with human capital approaches. He points out that the nature of the investment of individuals and firms depends on the expected period of gaining profits. Individuals and firms are likely to pursue a high-skill strategy only if they have a long-run perspective.

This is so because they will take a longer period to get the full return on their investment after acquiring higher-level skills as a result of several years of training. Therefore, individuals or firms that plan to maximise a short-term profit are unlikely to seek the opportunity to raise skill levels, since this would raise the costs of investment and lengthen the time of gaining returns. Hence, Finegold (1991) claims that individuals tend to take risks when making investment decisions, mainly because they lack adequate information regarding future manpower requirements. For example, individuals who seek a particular type of skill may find that no companies require their competencies, which then disables them from realising an adequate return on their investment. In short, therefore, the claims of human capital theory with respect to the relationships between investment in education and training and subsequent labour market behaviour are strongly disputed. Nevertheless, they have their strong proponents too. Certainly, what emerges from this brief review is that there is a need to examine actual labour market behaviour, rather than relying on the general theoretical model of human capital. It is important to examine what employers actually are looking for in their recruits and how they recruit the people that they seek to employ. Therefore, there is a need to carry out empirical work to examine the process of recruitment and the relevant required criteria that employers look for in their recruits. It is this which provides the focus for the empirical work reported in the second part of this study.

It is also important not to lose sight of the second dimension within human capital theory. This relates to the improvement in education or skills as a means of generating economic growth for the benefit of the nation or region concerned. The contribution of education and training to the national economy, however, is also controversial. Although it is almost universally adopted by governments as a key route to economic growth, the actual contribution that education and training can make to the enhancement of productivity through technological innovation, new forms of work organization and so on, remain disputed (Rees, 1997). On the one hand, many economists insist that education has a capacity to influence the level of productivity of labour in various countries (Kahan, 1965). For example, the World Bank (1993) highlights the extraordinary role of education in East Asian countries such as Japan. It claims that Japan maintains the quality of its education in order to sustain its rapid economic growth. Certainly, Japan's economic success is centrally dependent on the talents of its people, as the country is poor in natural resources. Reischauer (1977), for example, argues that:

High literacy and excellent educational standards are also major reasons for Japan's success in meeting the challenge of a technologically more advanced west in the nineteenth century and for its subsequent achievement of a position of economic leadership. Nothing, in fact, is more basic to Japan's success than is its educational system.

(page 167)

Furthermore, the proponents of human capital theory claim that investment in formal education is fundamental to a nation's economic growth. Here, what education can contribute to the national economy depends upon the factors with which human skills are combined in production (Berg, 1970). According to Berg (1970), education provides three direct contributions to economic development. Firstly, new techniques that generate from higher education can be in the form of physical capital, which in turn, determines the rate at which an economy can advance. Second, the higher the skills given to the labor force, the more likely they are to propel changes in methods of production. Thirdly, a less tangible aspect of education's role relates to the complex nature of relationships and attitudes, which link consumers and workers and management. Therefore, education should become an investment in the future in enhancing human capital to serve national development (Hough, 1987). Investment in education thus is seen as a strategy for national development, which reflects the capacity of a national economy to generate an annual increase in gross national product (Abrokwa, 1995). Furthermore, once education in any nation improves, the problem of unemployment decreases and this is reflected in the nation's economic performance too.

These kinds of arguments, however, need to be set against contrary claims. In the best recent review, Ashton and Green (1996) contend that it is hard to relate education and training directly with economic development, since most studies are unable to show acceptable empirical evidence. Economists have most frequently measured the relationship between education and economic performance in indirect ways, using the link between education and earnings. Certainly, the positive association between education and earnings is one of the most striking findings of modern social science (Blaug, 1973); and earning differentials are the commonest measure of the economic value of education and training (Carnoy, 1994). However, as Ashton and Green (1996) argue, the relationship with economic growth nevertheless still needs to be established; and the mechanisms through which education and training affect economic performance demonstrated. Certainly, it is clear that the relationship is not a universal one. Hence, in some advanced industrialized countries, low-skill production, involving low-value-added goods and services such as textiles, footwear and personal services, remain competitive in the market.

These low-skill sectors do not require high levels of education and training (for example, Ashton and Green, 1996). Therefore, in terms of the economy as a whole, it is not necessarily the case that more training is best for all. Firms can make more profits by following a 'low-skill' route, where both wages and skills remain low (Ryan, 1991). For example, a 1989 survey of more than 25,000 firms across the European Community (EC) found that skills levels were especially low in Britain. Indeed, both Britain and the US industrialized on the basis of a quite poorly educated working class (Ashton and Green, 1996, p. 7), although this is seen as a problem, which needs to be resolved. Hence, it is widely argued that a higher proportion of the labour force with intermediate-level skills would benefit the British economy (Steedman, 1998), although the policy tools to bring this about have yet to be implemented.

With regard to the above, some commentators have argued that the role of education and training needs to be understood in the context of wider development strategy. For example, in parallel with human capital, investment in physical capital, the development of natural resources, the organization of foreign aid and international trade, all contribute significantly to economic development. Certainly, for newly industrialized and industrializing economies, development strategy needs to ensure that all these conditions are fulfilled. Hence, governments are now providing incentives for investment in both human capital (providing education and training) and physical capital (to cope with incoming new technologies), mainly to try to ensure a balance between skilled manpower outputs and job availability (Tzannatos and Johnes, 1997). This is so because the solution to unemployment is to invest in education and to increase the formation of physical capital (Carnoy, 1977). Thus, skills development strategy needs to go hand in hand with wider economic development strategy, as it is claimed, happens in some of the industrialized countries of East Asia (see below).

Accordingly, as the country continues to develop, the government needs to create more jobs, whilst human capital is increasingly needed in preparing individuals with knowledge and skills so that they may gain access to jobs, as well as becoming more productive and thus improving the economy. This relates to the findings of many studies, which show that the higher the level of economic development of a country, the higher the proportion of its population entering education at all levels (elementary, secondary and higher education). A wealthy country is able to provide high standards of education, whilst high-level education is required to generate the economy (Collins, 1979). Many people believe that better education and training can improve living standards because it offers individuals an easier way to find employment, as well as to earn more wages. However, it is clear that jobs need to be created before hand, and this is very likely to occur in a country that has better economic performance. To this end, education and training are seen to occupy a variety of economic agendas in many countries, including Malaysia.

Despite the criticisms of human capital theory, then, it remains a theory, which underpins most governments' strategy with regard to national economic development. But the success of the human capital model depends on achieving a good relationship between investment in education and training and the actual patterns of employment development. For example, some forms of economic growth will create jobs that do not necessarily require high-level skills. This then encourages employers to maximize their profits through low-value production, which does not require high-level education and training. Brown and Lauder (1995) nevertheless argue that low-skill work roles often face the problems of minimum level of commitment from workers, high rates of absenteeism and strikes. However, there is another model of economic development that requires employers to shift into high-value production, which requires high skilled, high-waged workers. Whatever kinds of economic development that are achieved or aimed to achieve, this should be closely matched with the skill development provided by education and training. Education and training may well contribute to making somebody employable. But at the same time jobs need to be created. In this context, Brown and Lauder (1995) suggest that employers and individuals should act together in responding to training in order to match supply and demand of trained labor. They further suggest that both employers and individuals need to bear the cost of training to reflect their own benefits.

3.0 CONCLUSION

What the above arguments suggest, therefore, is that investment in education and training *alone* is not a guarantee of economic growth. There are other conditions, which pave the way to economic development. As has been seen earlier, according to Ashton and Green (1996), there are essential institutional requirements that also need to be fulfilled. In particular, the role, which the state plays in fostering effective relationships between skills development and economic development, is seen to be crucial. In addition, the commitment of employers to the skills development process is viewed as central. For example, the Singaporean government has taken a very active role in promoting economic development by investing in foreign companies, and at the same time plays a very active role in preparing skilled workers. This is aimed to develop the institutional mechanisms whereby economic development and skills development come together.

It seems that the policy needs to ensure not only that the government invests in education and training, but also needs to have institutional arrangements to ensure that the people who receive education and training are able to contribute to economic development through active engagement in employment. In industrializing countries such as Malaysian, however, the situation is rather different whereby the institutional arrangements are found to be ineffective, and therefore improvements are needed. Clearly, the latter is of great importance to the Malaysian context as this country is in the process of improving its economy. As Malaysia has experienced rapid economic growth very recently through its industrializations process, the emphasis on the development of human capital is given via engineering education for skill formation to sustain its economic growth. Consequently, the government continues to improve engineering education to be more competitive to cope with the current labor market demands. At the same time, general education remains useful and becomes the vehicle of those interested in the academic route. This therefore points to a more general issue relating to the relative significance of different forms of educational provision in the development of human capital.

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