Revisiting Malaysian Modernisation: Essays on Science, Technology, Religion and Environment

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Enhancing Human Capital for Technological Development: The Challenge in Malaysia’s Skilled Human Capital Development

By

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Introduction

Human capital, which consists of expertise and skills, play an important role in generating products of high quality. The importance of the human factor has been recognized since the period of Adam Smith. Smith (1930) in his "Inquiry into the Nature and Causes of the Wealth of Nations" argued that economic growth depends not only on physical capital such as machines, factories and tools but also investment in human factor.

The neoclassical economist, Robert Solow (1963) also mentions the idea of human capital in terms of innovation process in his economic growth model. In his theory, Solow had shown that if there were no technological progress, then the effects of diminishing returns would stop economic growth. Solow, a professor at Massachusset Institute of Technology (MIT) defines innovation as the factor used in increasing capital. In order to sustain growth, there must be continual advance in the innovation process and innovation can only happen if there is enough supply of skilled manpower.

The relationship between human capital and technology growth has also been studied Sanjaya Lall (1999, 2001). Lall sees skills embedded in human capital as the factor that determines a country’s competitiveness. According to Lall, the effective use of technologies depends on human skills. He also stressed the importance of developing a wide and diverse skill base
because different technologies require different skills. For Lall, if skills are present, technologies will be imported, absorbed and used efficiently without cost and risk. However, a country must have a proper framework, in order to make investment in technology more fruitful and successful. As argued by Xiao and Lo (2003), government policies, education and training program quality and workplace management are among the important strategies that should be applied in determining the success of a skilled human capital development. Successful adaptation of technology will be achieved by fully understanding all the elements contributing to competence building as well as strategy that coordinates the direction of human capital development.

**Human Capital Development in the Malaysian Context**

In 1991 the Malaysian government under the premiership Dr. Mahathir launched a long term plan known as Vision 2020, which has implication for the Malaysian economy. Vision 2020 emphasized building capability in technology with the aim of Malaysia becoming a fully developed country by the year 2020. The cultivation of science and technology for economic growth implies the increase of knowledge and technological learning involved in economic activities and a leading role to be played by skilled human capital. Fleming and Søborg (2010) have claimed that the development of skilled human capital in Malaysia has nevertheless been insufficient to cater for these demands.

According to Lai and Yap (2004), Malaysia’s skilled human capital supply is not adequate to allow technological development to take place. A comparative study of Lai and Yap of Malaysia, Korea, Singapore and Taiwan showed that Malaysia has the lowest supply of skilled human
capital. And this is after taking into account that among these countries that the number of science and technology graduates in Malaysia has increased the most. Lai and Yap’s (2004) study also showed that compared to Korea, Singapore and Taiwan, Malaysian literacy and enrolment in tertiary education is the lowest. For instance, in the year of 2000, only 13 percent of 20 to 24 years old Malaysian students enrolled in tertiary education compared with 43 percent in Korea, 53 percent in Singapore and 52 percent in Taiwan (Lai & Yap, 2004).

Malaysia has a well-structured education system. However, the rapid progress in the global economy has changed the demand for human capital and the educational system’s ability to supply the market with skilled human labour. Despite all efforts taken in preparation of this new circumstance, the shortage of supply in local skilled human capital still occurs. Among the factors that have contributed to this situation are education system in school, number of students in science and technical streams, mismatch problems, flight off domestic talents and science and technology policy.

To have human capital that actively contributes towards the innovation process, science and technology based courses should be given strong emphasis in the local educational syllabus. To learn science effectively, it is important to have a high level of critical conceptual and problem solving skills. The Malaysian education system is strongly based on examination (Rahimah, 1998, Lee, 2004, Sharifah Maimunah, 2005 and Roselina, 2009) and rote learning (Rahimah, 1998 and Roselina, 2009) which may discourage effective higher level scientific thinking. The rote learning culture encourages students to memorize rather than understand knowledge. Meanwhile, the practices of an examination oriented system also leads to situations where
students learn to become excessively instrumental and not acquire problem solving skills.

Mismatch between the skills possessed by graduates and the market requirement is also a challenge faced by Malaysia in developing its skilled human capital (Muk & Jamal, 2006 and National Higher Education Research Institute, 2010). According to a survey conducted by Bank Negara:

The survey conducted by Bank Negara in 2002 on “Employability of Graduates” discussed in length this issue of skill mismatch (Bank Negara Report 2002, p. 39). The survey covered 312 companies, out of which 187 companies responded to the survey. The result shows that 77.6 percent felt graduates did not have the necessary skills, 31.3 percent noticed that graduates were unable to meet the potential employers’ wage demands while 28.4 percent indicated that the universities were not producing sufficient number of graduates in selected fields (Muk & Jamal, 2006, p.111-112).

Rapid change in technology has created a high demand of skilled human capital in the employment sector. Basically, the mismatch of skills is measured in two ways; firstly is the differences between courses taken by students at institutions of higher learning and the demands of industry, and secondly, by the insufficiency of the graduates’ generic skills that could meet the skills desired by employers. The former demonstrates the differences between specializations of graduates’ with the areas of need in the manufacturing sector; the latter is emphasized on the value of an individual besides academic performance. A report by World Bank (2005) on firm competitiveness in Malaysia found that both factors are pervasive problems in Malaysia. A survey conducted on 1,151 firms has shown that apart from a lack of generic skills, a shortage of university graduates has forced firms to employ graduates with low or inappropriate qualifications. And although there are unemployed graduates in the country, the survey shows that 40 percent of them are not interested in the manufacturing activity (World Bank, 2005).
Hard skills and soft skills are two types of skills that should be possessed in order for the employees to understand the task given. Hard skills are the technical skills that are obtained from teachable knowledge or practical training. It is usually easy to train and absorb (Coates, 2006). Meanwhile, soft skills are the generic skill that is embedded in an individual.¹ The skills are non-technical skills that are usually difficult to learn and normally are acquired through the process of day to day experiences. It is also known as the 'people skills' since it is related to interpersonal behaviour and involving the interaction with other people (Coates, 2006). The employers will be looking at the mixture of both skills when recruiting, because having both skills will enable the workers to learn and adapt quickly to the changes brought by new technology. Skilful workers are not only those who excel academically but also those who have the cognitive ability.

However, Malaysian graduates are claimed to be lacking in soft skills such as communications skills, critical thinking and problem solving skills (Nor Hartini, 2007 and Roselina, 2009). A survey done by National Higher Education Research Institute (2010) on the issue of university curriculum and employability has found that communication skills, particularly the ability to converse in English language is the most influential factor that contributes to the weakness of graduates in getting employment. As reported in Muk and Jamil (2006), from a survey conducted on skills comparison between the local and foreign graduates, it was found that Malaysian graduates were weak in communication skills, problem solving skills, technical skills and have a low proficiency in the English language.

Realizing the situation, the Malaysian Ministry of Higher Education has requested all public
institutes of higher learning to include more soft skills elements in the subjects offered. Among the elements in the soft skills that are supposed to be incorporated in university courses are communication skills, critical thinking and problem solving skills, team work, lifelong learning and information management skills, entrepreneurship skill, ethics and professional, moral and leadership skills (Roselina, 2009). The module was drafted by a committee comprising academicians and officers from public universities and was offered for first year students starting in 2007 (Hariati, 2007). Based on the framework suggested by the Ministry of Higher Education, there are six channels where soft skills could be developed in the institutions of higher learning. Soft skills could be offered as a separate subject, embedded in existing subjects, developed through formal and informal university’s curriculum, in the programs organized for academic or non academic purposes, in industrial training and in ‘soft’ finishing schools in the faculty (Malaysia, Ministry of Higher Education, 2006).

This initiative whilst promising, has faced a number of challenges in terms of its implementation. Firstly, since soft skills are mostly embedded in current subjects at the universities, or offered as non-core subjects, there is a high chance that students will give less commitment to developing these skills. This is contributed to by a dominant learning style in the education system that is very much focussed on grades. Even though the students are exposed to the soft skills element within the subjects, they will study the subject for the final marks rather than develop soft skills.

Secondly, it is an uneasy task to change learning traditions in a very short time frame. According to Roselina (2009), the duration of three to four years of tertiary education with fourteen weeks in each semester is far from sufficient to change students’ personal characteristics. This situation
is added to, by the fact that the assimilation of the soft skills very much depends on the students' individual background and character. Finally, since soft skills are skills that involve interpersonal behaviour they are not easily taught, so their successful dissemination very much depends on the creativity of lecturers and the quality of tuition (Roselina, 2009). For this purpose, lecturers need to have teaching and delivery techniques that are able to convey knowledge in a manner that is easily understood and acceptable. To train lecturers with appropriate skills is not an easy task and also requires facilities and sources that are sometimes limited to access. Continuous reinforcement is needed in order to monitor the effectiveness of the implementation of soft skills development and at the same time every organization involved i.e. the government, universities, lecturers and students, need to be efficiently coordinated in their effort.

Another problem faced in the process of developing skilled human capital in Malaysia is the number of students enrolled in the science and technical streams. In order to encourage and increase human capital in innovative activity, it is important to introduce scientific and technical subjects at an early stage. In Malaysia, whilst the science subjects are introduced in the early years of schooling, i.e. since primary one, few students choose to continue majoring in science subjects in secondary levels of education. A stigma that is frequently attached to science subjects is that they are difficult to learn. Whilst there have been recent improvement in the enrolments over recent years, the enrolment of students in science and technical streams in secondary schools and tertiary level of education is still not sufficient to cater for the needs of a properly skilled workforce.  

In addition, another challenge faced by Malaysia in developing its human capital skills is the
local scholarship system. A study by Ozay and Yip (1984) found that Malaysia’s system of granting scholarships is not functioning. Under the system which still applies in the present, students granted with scholarships are only bound to work for the government for seven years without mentioning any specific field. After graduation, students can choose to work in any governmental sector of employment. Quoting from Wan (2011):

At the moment, scholars upon completion of their studies, are not assigned to a particular area within the civil service, and have to re-apply to join the civil service in a particular position. For example, a scholar with a law degree could possibly join the Attorney-General Office, Administrative and Diplomatic Service, Police or Judiciary, but he or she will have to apply the positions individually and compete with all other applicants. In the event that they failed to do so, these scholars will have their bond release unconditionally (p.7).

Also some of these scholarship holders are willing to pay back the money in order to work in different sectors (Kok & Tee, 2009). To secure the benefits of scholarships to Malaysia’s economic development, the government needs to encourage students to develop their skills in the appropriate technical areas.

Malaysia’s science and technology policy particularly in fiscal areas and in encouraging foreign investment may also be contributing to these problems. Although fiscal incentives in attracting foreign direct investment have worked very well, they were less effective in promoting skills-upgrading and innovative activity. Whilst foreign firms have enjoyed the tax exemptions they were not very motivated to promote and upgrade skills technology and increased local R&D. Tidd and Brocklehurst (1999) have reported that there are only 14 design engineers from a total of 2,000 of overall workers at Hitachi Semiconductors (Malaysia), although the Japanese subsidiary company has been in Malaysia for more than 25 years. Meanwhile, a study done on
the electronics industry in Malaysia has showed that there are limited technological developments within the MNCs. Most of these foreign companies prefer to perform the research and development activities in their home country rather than in Malaysia (Narayanan & Wah, 2000 and Norlela & Figueiredo, 2004).

A study by Norlela and Figueiredo (2004) has shown that most of the electronic MNCs in Malaysia only focus on assembling activities rather that conduct research-based activities. From 53 samples of MNCs studied, only two of them have seriously taken the initiative to invest in research activities. Norlela and Figueiredo (2004) also found that although these MNCs are gradually transferring innovative activity into Malaysia, major R&D activities still remains in their parent companies. This has constituted a barrier to the local talent to master and gain full knowledge from the transfer activity. On the other hand, according to Narayanan and Wah (2000), insufficient supply of skilled human capital, limited market size, and a weak intellectual property right protection system, is among the factors contributing to the reluctance of MNCs to locate their R&D activity in Malaysia. A survey conducted by Hasnah, Sanep and Rusnah (2010) on 100 foreign companies located in Malaysia had shown that 58 percent of the firms state that availability of skilled workers is a significant determinant of their location in a host country.

The leakage of talent is one of the reasons for slow technological progress and reducing of potential foreign investment in R&D. The brain drain problem has been a recent obstacle encountered in the development of skilled human capital in Malaysia.4 Due to global competition, Malaysia has been gradually losing its skilled people who are travelling abroad in search of better careers. It should be noted that this is happening not only in Malaysia but also in
most developing countries. Thiruchelvam, Kamarul Zaman and Koh (2004) postulate that the brain drain does not only indicate the country’s loss of a stock of skilled workers but also loss of benefits from the returns of the capital that have been invested in a worker. High investment is allocated to educate and train a skilled worker and it is hoped that through this investment the worker would pay the country back by contributing to its future growth. However, when this worker decides to migrate abroad it will be a loss to the country’s economy.

As stated by Davenport (2004), brain drain happens because of the attractive opportunities and prospects offered by the host country. Muula (2005) in his research on brain drain among health professionals and knowledge workers in Africa found that dissatisfaction with the working environment, particularly with salary, job satisfaction and career advancement, are the key motivating factors for workers to go abroad. However, Muula asserted that this process can be reversed through the implementation of strategies that support local human capital development which includes improvement of training programs and incentives system. Suntharasaj and Kocaoglu (2008) have agreed with this analysis. In their work on brain drain scenarios in Korea, China, India, Turkey, Africa, United States and Thailand they have stressed that strong support from the public and private sector, and possessing a national policy on human capital development are among the key factors reversing the brain drain.

In Malaysia, the political and socioeconomic situation, salary offered, and lack of infrastructure promoting knowledge and skills development are some of the factors that contribute to the skilled workers moving away from Malaysia (Thiruchelvam, Kamarul Zaman & Koh, 2004 and Kok & Tee, 2010). Skilled Malaysian workers are also highly marketable because many have the
ability to converse in multiple languages (Kok & Tee, 2010). It is reported that in 2006, about 785,000 skilled Malaysian workers worked abroad particularly in the industrialised countries (Malaysia, 2008). And between March 2008 and August 2009 a total of 304,358 skilled Malaysians had left the country (Kok & Tee, 2010). Singapore, United States, United Kingdom, New Zealand, Canada and Australia are the countries most regularly chosen.

To address the migration of skilled human capital problem, the Malaysian government through the Ministry of Science, Technology and Innovation has launched the scheme known as the ‘Brain Gain Malaysia’ under the Ninth Malaysia plan (2006-2010). One of the objectives of this plan is to gain back these skilled workers. However, the response received has so far not been altogether encouraging. In fact, ‘Brain Gain Malaysia’ is not the first and only government scheme which attempts to attract back local talent residing abroad. Previously, in 2001, the government under the Ministry of Human Resources launched a program known as the ‘Returning Malaysian Experts Program’ with the purpose to attract back skilled Malaysians working overseas. The difference between the ‘Brain Gain Malaysia’ program and the ‘Returning Malaysian Experts Program’ is that the later program is not only specifically for scientists, or those who are involved in R&D activity, but also includes all range of fields including science and technology (Thiruchelvam et al., 2004). It is recorded that until 2009, about 516 Malaysians have returned under the ‘Returning Malaysian Experts Program’ and 677 researchers have joined the ‘Brain Gain Malaysia’ program (Madinah, 2009).

Although both programs provide attractive initiatives to attract back these workers, the number of those who are interested to serve in Malaysia is still small. According to Thiruchelvam et al.
flawed mechanisms adopted in the implementation of these programs has contributed to this situation; the long process of obtaining approval from the administration for workers to return and the lack of focus in the program being important weaknesses.

Towards Enhancing Human Capital for Technological Development

Malaysia’s human capital needs have become more critical with the launch of the Vision 2020 development plan. This plan requires that there be further investments in education and training. In particular action needs to be taken in attracting and encouraging more young Malaysians to further their study at a higher level. As suggested by Lee (2004), university autonomy is a critical element in efforts geared towards improving the role of public universities in educating and training human capital. University administration needs to be freed from political influence. Academicians in consultation with industry should have a more dominant voice than is currently the case in influencing the shape of academic and curricula decisions relating to university development. University autonomy is essential in order for the university to be more flexible and at the same time be capable of responding quickly to the demands of the industrial sector. Improving the sector’s autonomy, flexibility and responsiveness to industry and social demands would not only provide direct benefits in improving Malaysia’s stock of human capital but also have direct economic benefits in terms of income generation by assisting Malaysian education to be viewed favourably as an export industry. The success of other countries such as in neighbouring Singapore in attracting foreign students could be taken as an example. If compared to other education exporting countries such as the United Kingdom (UK) and Singapore, Malaysia has a number of competitive advantages: Lower costs of living, an education system based on the British system, multicultural society, the availability of institutions such as the
Malaysian Qualification Agency (MQA) that monitor the quality of the university programs offered, and the use of English language as the medium of teaching. Thus, Malaysia needs to use these advantages in order to succeed in making the country the hub for education. Becoming the hub of education would also benefit Malaysia since it would also help sustain and attract talent into the country.

Malaysia also needs to revise its talent grooming schemes and programs in order to enhance its capacity to retain skilled labour and avoid the brain drain. Malaysia has tried several initiatives equivalent to those offered by the countries favoured by those leaving Malaysia, yet those programs have not been well received, and for some programs, the outcome is yet to be seen. Furthermore, the pull factors from the host countries have also contributed significantly to the flow of local skills abroad. Attractive facilities and incentives offered have increased the number of Malaysian mobility into those countries.

Nevertheless, through constant adjustment and revision of the brain gain programs, barriers and limitations on attracting back the skills could be overcome. Besides outlining a proper strategy for attracting skills, Malaysia also essentially needs to look at the push factors that influence the outflow of these skills. The national fiscal and non-fiscal policy instrument particularly should be given special attention as well as the country’s policy on human capital development. Additionally, it also requires proper revision of industrial policy, and science and technology policy that indirectly affects human capital policy which facilitate the flow of technology into Malaysia. The current policy on Foreign Direct Investment (FDI) for instance, which gives so much freedom to the multinational corporations (MNCs) in the country needs to be re-evaluated.
and improved. Malaysia offers favourable incentives in attracting these foreign companies into the country and it is indisputable that these companies do bring great economic benefits into Malaysia. However, few skills and knowledge is transferred by these international companies into the country. Therefore, improvement needs to be done on the implementation of national regulations especially on the entrance of these companies. Malaysia also needs to strengthen the capability of local businesses and firms to be able to absorb know-how input brought in by the MNCs.

Conclusion

In recent years, economic success of a country has been measured by active participation in technological innovation. Successful innovation demands strategic investment in human capital. The more sophisticated the technology, the more innovative and creative human capital is required. The success of the Malaysian economy in recent years has contributed to a stable political situation; reductions in the level of poverty and the upgrading of living standards. In terms of industrial development, for the last 10 years Malaysia has maintained one of the highest levels of high-tech exports in the world (Economic Planning Unit & World Bank, 2007). However, in order to sustain this situation in the long term, Malaysia needs to transform itself into an innovative economy in which competitiveness is no longer dependable on mass production, low cost manufacturing, and unskilled labour and low wages. The Malaysian government is aiming to build an economy where science and technology are integrated into the production process. The launch of the Malaysian long term plan, Vision 2020 is the starting point for strengthening national technology capability. This long term vision will be fully achieved if the country possesses sufficient supply of highly talented human capital with the ability to cope
with the changes brought by technology.

1 A study by Kahirol, Nor Lisa and Khairul (2010) has shown that in the current labour market, soft skills particularly interpersonal skills, technology skills and communication skills are highly demanded. Indeed those skills are used by employer to evaluate workers’ abilities before employment.

2 The Eight Malaysia Plan (2000-2005) reported that enrolment of the upper secondary students in the scientific and technical stream increase from 18.5 percent in 1995 to 34.5 percent in the year of 2000. Similarly the enrolment at the first degree of the scientific and technical stream also had shown an increase from 40.7 percent in 1995 to 52.0 percent in 2000. As reported in the National Survey of Research and Development 2008, by MASTIC, in order to enhance the country’s technological capability, it is estimated that Malaysia will need 50 skilled human capitals with scientific and technical background for every 10,000 workforce. Currently, Malaysia has 18 scientist and researcher per 10,000 workforces (as in the year of 2006).

3 Tidd and Brocklehurst (1999) also stated that “Similarly, Matsushita was established in Malaysia in 1972, and now employs more than 30,000 workers there. The company did not add a design and development function until 1994, which currently employs less than 60 people. The American owned semiconductor subsidiaries are even more narrowly focused on manufacturing. In almost every case little or no effort has been made to add design, development or marketing capabilities to manufacturing operations” (p.253).

4 According to Davenport (2004), the term ‘brain drain’ was first used by the British Royal Society in the 1950s to explain the outflow of scientists to the United States and Canada. The word ‘brain’ refers to skills possessed by individuals and ‘drain’ on the other hand, refers to the high rate of exit. ‘Brain drain’ is often refers to outflow of highly skilled human capital with tertiary level education.

5 In December 2010, Malaysia has launched the Talent Corporation under the Prime Minister’s Department. Talent Corporation is one of Malaysia’s current initiatives to identify shortage in key sectors and at the same time to attract, nurture and retain the necessary human capital. Three major programs are facilitated by Talent Corporation; 1) Returning Expert Program, 2) Residence Pass and 3) FasTrack program. See Talent Corporation Malaysia website for further information.
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