

Human Resource: Issues & Challenges, Prospects For Growth (By Anna Ong Cheng Imm)

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Introduction

Human resource is the key issue for many developing as well as developed countries. Its availability, whether skilled or unskilled is a determining factor for the inflow of foreign direct investments (FDIs) to many developing nations. Human resource is also an important factor in determining the competitiveness of individual companies as well as a requirement for developing industrial clusters.

Penang depended on its abundant supply of literate and trainable labour force to attract investments in the export-oriented electronics industry since the early '70s. This labour force has gone through skills upgrading and enhancement in the past three decades and today, Penang can boast of having a pool of relatively skilled and professional labour force that is capable of handling and developing state-of-the-art technologies. Penang has been identified as the top region for the electronics industry in Malaysia¹ and is also well known as the Silicon Island of the East. Despite these accomplishments, human resource, which was and remains the key factor in driving Penang's economic growth, continues to be a development issue in Penang.

Issues & Challenges

Issues

The human resource issues discussed in this article mainly refer to the issues encountered by manufacturing establishments in Penang. These issues are more pertinent to Penang because the manufacturing sector is the largest contributor to the Penang economy, accounting for 46 per cent of the State's GDP in 2000. Six major issues have been identified as follows:

(i) Shortage of Skilled Personnel

Although Penang has been identified as the top region for the electronics industry in Malaysia and is also commonly referred to as the Silicon Island, the State still lacks the skills base that builds up a silicon island. This refers to design and research & development (R&D) capabilities. As such, Penang is still very much a manufacturing and assembly hub rather than a high-tech island.

This issue is mainly attributed to the shortages of software engineers, which is a skill area that is very crucial for the development of information and communication technologies (ICT) and other high-tech industries and activities. In the past five years (1996-2000), Malaysian universities only produced about 5,360 graduates in physics, engineering and information technology related courses.² On the contrary, these skills are widely available in the newly emerging economies like India and China that are competing very aggressively with Penang, and Malaysia in general, for FDIs in high-tech areas that are anticipated to contribute to further transfer of technology and know-how to the local labour force. These two newly emerging economies are also producing more graduates in such skill areas as well as providing a larger market base for the FDIs compared with Malaysia, which has a small population base. As for Malaysia, the five key science & technology universities³ are expected to produce only an additional 12,000⁴ graduates in these fields in the next five years.

The Malaysian Government made the right move by shifting towards k-economy, especially in keeping pace with the other developed nations. However, adopting the shift towards k-economy also means that more information technology (IT) personnel will be required. It is estimated that by the end of 2000, additional 15,000⁵ IT personnel were required but this demand could not be fulfilled by the existing supply of engineers and IT graduates as discussed earlier. In addition, Malaysia would also encounter stiff competition from the developed countries like the US⁶ and also with other countries in this region in attracting qualified IT personnel. Table 1 shows the demand for IT personnel in selected countries. This competition is the first shot of a battle for 'brains' that may determine the winners and losers in the new economic era and the first signs of

decelerating growth will be measured by relative decline in productivity and competitiveness.

Table 1: Requirement For IT Personnel In Selected Countries

Country	No of IT Personnel Required	Time Frame
Malaysia	15,000	End 2000
Korea	50,000	2002
Hong Kong	17,000	2005
India	2,200,000	2008
Thailand	800,000	2015

Source: FEER, 9 November 2000

The manufacturing establishments are also facing shortages of engineers, especially those in the fields of electronics, mechatronics and software. This is partly due to a mismatch between the supply and demand of workers. There is a surplus of civil engineers, town planners as well as graduates of arts-related and business administration degrees while the manufacturing establishments are facing shortages of engineers. This indicates a lack of coordination between the institutes of high learning and the industries. The institutes of higher learning are still producing in mass quantity graduates of business and arts-related courses while the industries are asking for more graduates in engineering and technical courses, at either degree, diploma or certificate levels. Furthermore, parents are still keen on encouraging their children to complete their formal education up to the A-level and then to pursue their tertiary education in business or arts-related courses in private colleges even though their children are not academically inclined. The perception is that if their children hold white-collar jobs, it is better than blue-collar ones. As such, there is a surplus of non-technical labour force while shortages also occur at the technician levels. This surplus labour could very well be trained as technicians right after their secondary education without the trouble of going through tertiary education in business and arts-related courses. As technicians, they could be trained and upgraded as assistant engineers and eventually engineers. As a result of the surplus of business and arts-related graduates and the scarcity of science & technology (S&T) graduates, the issues of labour mismatch, shortages and unemployment are further aggravated.

It should be noted that other than the electronics industry, other industries that play supporting and ancillary roles to the electronics industry are equally important. These industries also encounter problems of shortages of skilled workers. Plastic injection moulding companies, in particular, do not only lose their workers to the electronics companies due to their less attractive remuneration packages, but are also unable to recruit engineers that possess the relevant skills. The universities and institutes of higher learning are not offering courses that fulfil the entire requirement of the plastics companies. For example, the polymer science course that is being offered by the USM equips the students with knowledge on the materials but not the moulds, machinery and process as required by the plastics companies.

There is also a general shortage of mould designers and makers. When Malaysia began to promote export-oriented industrialisation, the government missed out on the promotion of mould and die industry. As such, Malaysia does not produce a sufficient supply of mould designers and makers. Most of the moulds used in production are being imported while some companies have taken the initiative to design and make the moulds locally. However, to meet their production requirements, companies in the mould and die industry, have to import their workers from abroad. Despite these shortages, the government has not been very supportive in the approval of work permits for foreign experts. There were cases of applications being rejected without reasons. Table 2 summarises additional requirement for engineers, IT-related professionals, technicians and mould & die makers in 2000 and 2001.

To further support this claim, a recent short survey of 12 firms by SERI shows that 75 per cent of the respondents indicated that they had to bring in foreign expertise into Penang because local expertise was not available. These companies brought in a total of 101 foreign experts from countries like India and US during the past 5 years. These foreign experts include the following: experienced technical experts, senior management staff, software experts, experts in optical components and communication technology, experts in IT applications, experts in service

operations, direct sales directors, marketing directors, online sales and marketing experts, business development managers, R&D scientists, as well as design engineers.

Table 2: Additional Requirement For Manpower

	2000	2001
Electronics Engineers	361	372
Mechanical Engineers	299	240
Industrial Engineers	79	71
Chemical Engineers	31	27
QC Engineers	145	149
Engineers (others)	103	90
System Analysts	86	94
Computer Programmers	39	41
Technicians	1151	1168
Tool & Die Makers	62	74

Source: Derived from PDC Industrial Survey, 1999

(ii) *Shortage of Highly Qualified People*

There is an acute shortage of highly qualified personnel. In the past, the MNCs had to bring in foreign experts to manage their local operations. Today, many of the MNCs, particularly those from the US have appointed local CEOs and managers to manage their local operations. However, local expertise at this level, namely the top one per cent of the hierarchy in the corporation, is still scarce. It cannot be denied that there are many qualified Malaysians to hold such positions. However, many of them are currently stationed overseas serving the large corporations in developed nations. These Malaysians are either involved in the management positions or in R&D activities or they are specialists in the various skill areas such as biotechnology, information technology, software development, physics, etc.

Some of these Malaysians may wish to return and serve in Malaysia, but there are other impediments that discourage them from doing so. The incentives proposed by the government during the 2001 budget is a positive stance taken by the government to encourage the return of skilled and professional Malaysians. However, the impediments that are discouraging these Malaysians from returning are more than just the permanent residence status and duty free repatriation of possessions from abroad that the government had promised to grant. These disincentives include the career prospects of these Malaysians, the education and healthcare provisions for their families, the social and cultural environment, as well as the overall quality of life in Malaysia.

(iii) *Lack of Entrepreneurial Expertise*

As more companies are moving up the value chain, companies are expanding their activities from their traditional assembly and test operations to include design, R&D, distribution as well as sales and marketing. Such moves towards higher value-added activities require not only technical capabilities but also entrepreneurial and management capabilities. Nevertheless, the existing labour force is not able to keep pace with the enthusiasm of the industries to develop towards this end.

Companies that are adopting the Manufacturing++ concept, particularly those that are extending their activities towards distribution, sales and marketing are unable to recruit personnel who are equipped with all the requisites required because they lack managerial and entrepreneurial expertise although they possess technical skills. The lack of managerial and entrepreneurial expertise is also partly attributed to the lack of training institutes that provide a good combination of technical and managerial courses. The low hiring rate⁷ by MNCs, particularly those that implement the Manufacturing++ concept indicates that the job seekers are unable to meet the MNCs' requirements. As such, the availability of good technical-cum-business schools/colleges would not only produce graduates with entrepreneurial and management skills but also with capabilities to build and fine-tune the systems to provide solutions for the future.

(iv) *Bureaucratic Bottlenecks*

The government has been very pro-active in its efforts to facilitate investors by having excellent policies and strategies that offer various programmes and incentive packages to attract and retain investors. Despite these efforts, investors and industrialists still encounter problems and challenges because bottlenecks still persist at the implementation levels. The application process for permits is still rather tedious and time consuming.

In addition, the present immigration regulations do not favour the in-migration of experts from the less developed countries. The restrictions as well as the duration of work permits for these experts serve as a factor that discourages the experts from coming to Malaysia.

(v) *Brain Drain*

The issue of brain drain is getting crucial. While Malaysians who have migrated long ago are rather reluctant to

return, the younger generation, particularly those who have and are going to pursue their studies overseas are increasingly planning not to return. These Malaysians chose not to return because of better and more challenging job and educational opportunities overseas. Likewise, Malaysians with foreign spouses and children are reluctant to return because they face difficulties in adjusting to the Malaysian school system and environment, social and cultural practices and the general living environment. The expectations of these Malaysians are also higher and may not be able to adapt to lifestyles in Malaysia after being abroad for many years.

Brain drain is not only attributed to the decisions made by Malaysians who have migrated abroad. The MNCs/LSIs are also responsible for the brain drain. LSIs/MNCs normally invest offshore to reap profits through the comparative advantages of the locations. Their employees are transferable within their offshore plants. While employees who are sent abroad by the MNCs/LSIs would normally return and serve in Malaysia, there are also possibilities that they would choose to extend their stint abroad for a longer duration, which eventually leads to permanent residence there. The experts/specialists would most likely continue their overseas stint and not return to Malaysia because they find their jobs more challenging there.

(vi) *Shortage of Production Workers*

Unlike the skills requirement by electronics and ICT related industries that are progressively advancing, there are still several industries in Penang with technologies and processes that have remained the same or where changes are nominal. These mainly comprise domestic-oriented industries as well as the apparel industry. Many of these industries are also still labour-intensive and not withstanding the usage of machinery and equipment, these companies continue to face shortages of workers at the production level. Although many of these companies have automated some of their production processes, there are also incidences when the companies could not justify their needs to invest in certain machinery and equipment due to their exorbitant costs. The required machinery and equipment are not available locally and thus need to be imported. The pegging of the Ringgit at 3.8 to a US dollar, though has enhanced the competitiveness of exporters, has increased the cost of operation of the importers of machinery and equipment. A recent survey by the Penang Development Corporation estimated that additional 17,833 production workers were required in 2000 and another 8,311 production workers will be required in 2001.⁸ The vast number of workers at the production level indicates that the manufacturing sector in Penang, in general, is still relatively low value-added and there is a need for these manufacturers to upgrade their facilities to manufacture higher-end products and to relocate the labour-intensive part of their production to lower cost locations.

Challenges

The greatest challenge to Penang would be when AFTA (Asean Free Trade Area) and WTO (World Trade Organisation) come into effect. This is when local policy will be increasingly determined by global forces, thus, resulting in smaller economies losing out, as they will be increasingly unable to affect global forces under the influence of larger economies.⁹

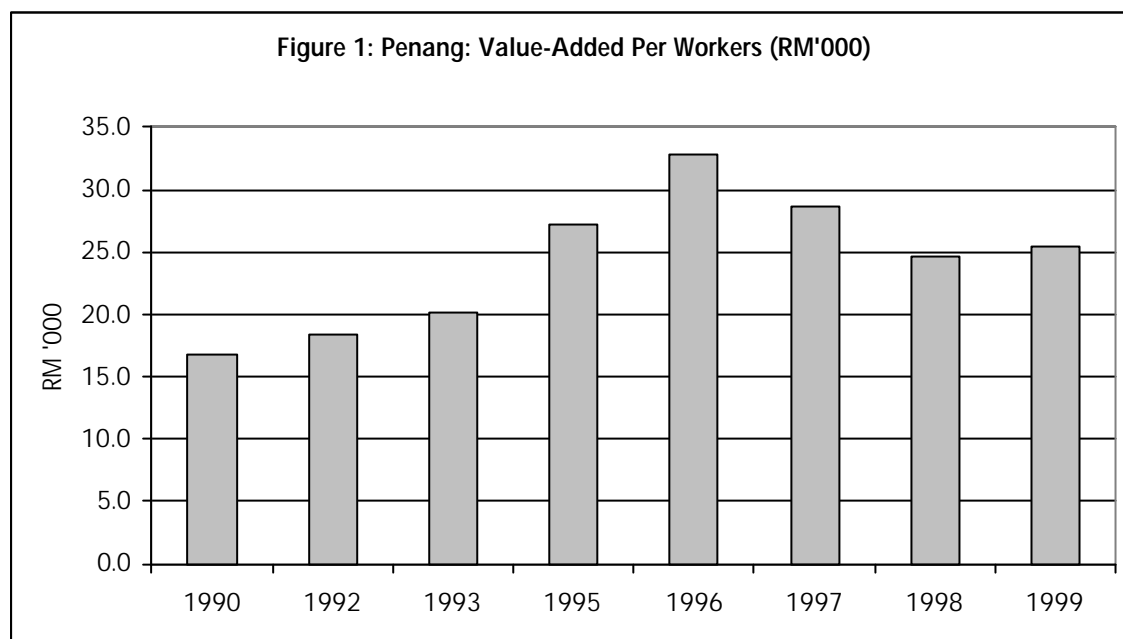
The rising cost of production and declining productivity have and will prompt more firms, whether local or foreign to relocate to lower cost locations like Thailand and Indonesia. Productivity as represented by value-added per worker in Penang peaked in 1996 and has been declining since then (Figure 1).

In a recent survey by SERI, 36 per cent of the respondents indicated that they would probably relocate some parts of their operation outside Malaysia and 30 per cent of them outside Penang, with the onset of AFTA in 2003. This implies that Penang will lose out to the neighbouring countries if the industries, including the supporting and ancillary industry starts to move out. This is mainly because the supporting and ancillary industry is an important determining factor for competitiveness and industrial cluster development. As such human resource development would play a more crucial role now in retaining the existing investments as well as attracting new ones because Penang can no longer be promoted as a low cost location. Other attributes for building competitiveness and cluster development, such as the provision of adequate and quality infrastructure, should be looked into to sustain economic growth.

Prospects

The future of the manufacturing sector in Penang will not be confined to manufacturing, assembling and testing but will encompass more value-added activities. More companies are planning to localise their design activities and to improve on their facilities and services to better serve the regional market. To move towards a higher value-

added plane, the labour force needs to be upgraded in various skills and expertise, including software design and development, logistics as well as computer sciences and hardware. More companies will also require people with post-graduate qualifications, particularly MBA and PhD. The short survey conducted by SERI confirms that all of the respondents will increase their demand for skilled labour, while only 9 per cent of them will increase demand for unskilled labour in the near future. The categories of skilled labour that will be most required by the respondents in this survey are shown in Table 3.



Source: Calculated from SERI' GDP figures and DOS Employment Data

Table 3: Most Required Categories Of Skilled Labour

Industry	Category of Skilled Labour
Electronics	Software engineers, Experts in optical components and communication technology, Experts in IT applications, Experts in direct sale & marketing, Technical experts, Experts in supply chain & online business model, RF engineers, Process engineers, Equipment maintenance experts, Test experts, Package development experts, Material management staff, Design engineers and Technicians
Apparel	Sewers, Ironers, Folders
Food	Technical experts

Some basic skills will also be required to help prepare the existing labour force to move towards a higher skill base and a list of hard skills and soft skills have been identified for this purpose (Table 4). The Penang Skills Development Centre (PSDC) has been very pro-active in offering such courses for Penang's industrial workforce. In addition to the PSDC, there are many other training institutes in Penang that provide skills training, particularly for hard skills. However, very few training institutes provide training on soft skills, especially training in sales and marketing as well as banking, accounting and finance.

Findings from another independent survey conducted by SERI recently outline ten top areas that need training to enhance management and technical skills as well as to improve quality and productivity (Table 5).

The training needs that have been identified, if implemented appropriately, would be able to prepare Penang's labour force to meet the new challenges in global technological developments. For instance, the emerging new products and technologies in the global markets like photonics and wireless application protocol and soon, general packet radio service, which will require skills enhancement in areas such as physics, optoelectronics, fourier optics, optical modulation, electromagnetics, optical communication network, microwave, wireless and radio frequency.

Table 4: Basic Skills Requirement

Types of Skill	Training
Hard Skills	Hardware, plastic technology including injection moulding, CAD, CAM, CAE, material science, hydraulics, EM, maintenance, failure analysis, process control, automation, Internet design, supply chain
Soft Skills	Communication & articulation, project management, team working & building, coaching, leadership, facilitation, housekeeping, sales & marketing, customer service, problem solving, banking, accounting and finance

Table 5: Top Ten Training Needs (in descending order)

Training Needs
1. Supervisory & Motivation Skills
2. Quality System Assurance
3. Production & Operation
4. Industrial Safety
5. Information Technology
6. Management & Performance Development
7. Purchasing, Supply Management & Shipping
8. Human Resource Management & Industrial Management
9. Customer Service & Sales
10. Training Development

Unfortunately, many people are still unaware of the importance of these new technologies, and thus, provision of training on such skill areas is limited. To compete for FDIs in these areas, Penang will need to upgrade the technical knowledge and capabilities of its engineers and technical labour force in these emerging skill areas. Failing thus, Penang's competitors, particularly China, would entice a high proportion of the investments in these areas.

On a more positive note, Malaysians are capable of handling these new developments. If the Malaysians, who were assigned overseas by their MNC employers, were to return, there would be greater opportunities for human resource and technological development in Penang. Findings from SERI's recent short survey indicate that 75 per cent of the respondents do assign their Malaysian staff overseas. Majority

of these companies (89 per cent) assign their staff to the US, while some of them also assign their staff to other parts of Southeast Asia (44 per cent), other parts of Asia (44 per cent), Europe (33 per cent) and South America (11 per cent). The Malaysians who were assigned overseas comprise those holding the positions as shown in Table 6 and their academic qualifications are as shown in Table 7. The reasons given by the respondents for sending their Malaysian staff overseas are as shown in Table 8.

The findings of this short survey indicates that Malaysians are capable and thus, with appropriate initiatives from the government, Penang and Malaysia would be able to compete in the global market as far as the emerging technologies are concerned.

Recommendations

It is imperative for Penang, through the Penang State Government to identify the types of development and industries the State desires and to be focused in its development efforts. By being focussed, it would be easier for the State to identify its training needs and the type of skills and people to target. This would also enable the establishment of a strong support foundation, which includes education and training of human resources, infrastructure development such as transportation, utilities and other facilities like R&D as well as supporting industries.

Subsequent to this, a two-strategy approach is recommended, namely a short-term strategy and a medium- to long-term strategy.

Table 6: Positions Held By Malaysians Assigned Overseas

Positions Held	Percentages of Responding Firms
Process/Test Engineers	78 per cent
Manager/Director of Departments	67 per cent
Design and R&D Engineers/Specialists	67 per cent
Non-Technical Executives	44 per cent
Technicians & Other Technical Support Staff	33 per cent
Non-technical Support Staff	33 per cent

Table 7: Academic Qualifications of Malaysians Assigned Overseas

Academic Qualifications	Percentages of Responding Firms
PhD	11 per cent
Masters Degree	56 per cent
Bachelor Degree	100 per cent
Diploma	33 per cent
Certificates	33 per cent
High School and below	11 per cent

Table 8: Reasons For Sending Malaysian Staff Overseas

Reasons	Ranking in Terms of Importance	Percentage of Responding Firms
Possess special skills unavailable at the location	1	44 per cent
Training & exchange purposes	2	78 per cent
Hardworking & diligent, and suitable for the job at the location	3	22 per cent
Others such as Job Rotation	4	11 per cent

Short-Term Strategy (1 to 3 years)

The short-term strategy is to allow the import of foreign experts who are required to help drive the growth of the economy, for the next three years, irrespective of their country of origin. This is to allow the local universities sufficient time to train and produce the required engineers and scientists.

The government, through the Penang Development Corporation (PDC) and the Immigration Department will have to work closely with the industries to define and identify the experts. A one-stop department to facilitate the industries, particularly new investors would have to be set up, most probably by the PDC. The establishment of the one-stop department would allow expeditious processing of applications and approvals pertaining to the import of foreign experts. In addition, the one-stop department could also assist the investors in their recruitment exercises, either the recruitment of local workers or foreign ones.

It is also important to encourage the return of qualified Malaysians who are currently abroad. The foreign spouses of these Malaysians should be allowed to work in Malaysia, if they are professionals. Those who possess special skills could be granted the permanent residence status immediately if their skills are deemed crucial to the economic growth of the country.

The corporate sector can also play their role in attracting qualified Malaysians to return, particularly those who are still studying abroad by offering them practical training stints in their factories. This will create awareness among students who are studying overseas on the importance of these industries in generating economic growth for the country as well as to enable them to experience the working environment in Malaysia.

Medium- to Long-Term Strategy (1 to 5 years)

The medium- to long-term strategy is to produce local graduates who are equipped with the required skills. This requires close collaboration between the universities and the industries to organise and conduct courses that are considered important for further growth.

There is also a need for innovation and incubation parks to nurture new high-tech start-ups. The government could assist by providing grants to potential local high-tech industries. In addition to grants, the government could also actively promote venture capital by providing seed capital to potential and deserving local companies.

Local companies should also be encouraged to carry out joint training programmes with their joint venture partners. This would create a win-win situation where the foreign partners would benefit from the work performed by the local workers while the local workers would benefit from the transfer of technology and know-how from them.

At the formal school level, the curriculum should be adjusted to inculcate critical thinking amongst students so as to produce the innovative labour force of the future. It is also important to change the mindset of the people and to raise their awareness on the importance of blue-collar jobs. The government and the private sector would have to play important roles in disseminating this information. A means for doing so is for the government to consider emulating the German education system to stream the students, where the less academically inclined ones are put into the vocational stream. Students in the vocational stream will be trained under an apprentice scheme and companies can adopt and sponsor them for further skills upgrading. Upon completion of their training, these students will serve the companies.

A longer-term approach would also require a comprehensive database on the supply of labour force. The data should include the number of school leavers at different levels. This would enable easier planning for skills upgrading and training.

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Endnotes:

1. Second Industrial Master Plan, 1996-2005.
2. Derived from Prof. Dr. Harith Ahmad, "Photonics Research in Malaysia", PSDC Forum on *Viability of Photonics Components Manufacturing in Malaysia*, January 2001.
3. USM, UKM, MMU, MU, UTM
4. Derived from Prof. Dr. Harith, "Photonics Research in Malaysia", PSDC Forum on *Viability of Photonics Components Manufacturing in Malaysia*, January 2001.
5. FEER, 9 November 2000
6. The Congress in US has recently passed a bill to expand its quota for imported labour, particularly those with IT skills.
7. Around 10 per cent.
8. PDC Industrial Survey, 1999.
9. Terence Too, "Globalisation, WTO & AFTA: A Commentary", *Economic Briefing to Penang State Government*, January 2001

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