MPMA

MONASH University
MALAYSIA

A STUDY OF THE MALAYSIAN PLASTICS INDUSTRY SKILLS NEEDS

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FINAL REPORT

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Acknowledgement

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1.0 Introduction

Plastics and related products have a significant impact on all aspects of human existence. They make significant contributions to a wide range of industrial sectors such as aerospace, transportation, construction, manufacturing, medical devices and others. Characteristics of adaptability, versatility and durability make plastics a preferred advanced material product for almost all sectors of the economy. Due to the wide range of applications across many industries, plastics and related products have continued to receive buoyant demand over the past few decades.

The plastics industry in Europe employs over 1.45 million people with a multiplier effect of 2.4 in GDP and approximately three-fold employments (The European House of Ambroselli Study, 2013)[1]. It is also regarded as one of the most innovative sectors in the EU with one in 25 patents submitted between 2003 to 2012. Plastics industry firms in advanced countries create significant economic impact on their economies by establishing a high value position and supporting continuous innovation. However, Asia currently holds an estimated 45% share of the world's plastics production whereas the USA and Europe account for a combined 40%. This shows how the plastics industry in Asia have the potential to drive economic growth in the region and is a critical enabler of innovation. Malaysia, being one of Asia's biggest exporter of plastic products (Plastics Industry Occupational Analysis, 2013[2]; Plastics Technology, 2016[3]), is well-positioned to capitalise on increasing global demand for plastics and related advanced materials.

The Malaysian plastics industry is a well-established industry with a strong performance record and is an important contributor to high skilled and high income employment. The plastics industry is considered one of the most dynamic growth sectors in the Malaysian manufacturing sector. The Malaysian plastics industry is a major supporting industry to many other important sectors including the electrical and electronics (consisting primarily MNCs), automotive and food packaging industries, through the supply of plastic parts and components and plastic packaging materials. One has to bear in mind that failure within the plastics industry will lead to a supply chain breakdown to these sectors.

Even with the slower economic growth over the last two years, the Malaysian Plastics Manufacturers Association (MPMA) revealed that plastics exports registered a 8.5% growth in 2015 (The Star, 2016[4]). In fact, the Malaysian plastics industry has been rated among the most competitive in Asia. In order to sustain the competitiveness, it is imperative for the Malaysian plastics manufacturers to focus on improving technologies, develop skills, explore new markets and concentrate on higher value products. The Malaysian plastics industry can move up the innovation value chain to support the many other important sectors with continued support from the Malaysian government, nurturance of strong linkages between industry associations, government agencies and research institutions to drive for excellence in process improvements and product development.

Although the plastics industry is not part of the 12 national key economic areas (NKEAs), it is intrinsically linked to all sectors and is an important contributor to the local manufacturing industry, providing feedstock into a diverse range of end-use sectors.

The major representative body of the industry, MPMA, actively collaborates with the Government in promoting the plastics industry to achieve the country's vision of becoming a developed nation by 2020. A series of economic plans were launched to enable Malaysian firms to move up the innovation value chain, attract talent and gain competitive advantage. However, firms in the plastics industry in Malaysia face challenges in navigating the transition from low value to high value positions to compete globally. Central to these transitions is the development of a highly skilled workforce.

The purpose of this study is to undertake a thorough assessment of the current and future skills needs in the Malaysian Plastics Injection Moulding (PIM) Industry and to explore options of improving upon the current process of skill training programmes. A survey was conducted with a sample of 60 firms operating in the Klang Valley, Malaysia. The survey provides characterisation and state-of-play of the different skills set in the industry as well as providing valuable insights on the challenges and gaps in the workforce.

1 http://www.ambrosetti.eu/wp-content/uploads/Executive-Summary-inglese.pdf

2 http://www.mpma.org.my/Pages/AboutMPMA.aspx

3 http://www.ptonline.com/articles/k-2016-focus-on-asean-plastics-industry

4 http://www.thestar.com.my/business/business-news/2016/05/30/exports-of-malaysias-plastic-industry-up-85-in-2015/

2.0 Objectives of the Study

The objectives of this study are four-fold as follows:

1. Assess the current and future skills requirement of the Malaysian PIM Industry.
2. Identify the key stakeholders (which include Government, Industry Associations, Research Institutions, NGOs, etc.) involved in supporting and training the workforce.
3. Identify current training practices for the skilled workforce in the PIM industry. The analysis will provide valuable insights on the key gaps that hinder the development of the Malaysian plastics industry due to lack of trained human capital.
4. Identify and suggest key strategies and recommendations that will address the skills gap in the PIM industry. Particularly, this includes improving the training provided by the various training institutions that meet employers' needs.

Focus of the Skills Gap Study

This study looks to address the following questions and issues:

1. What are the skills gaps of firms in this industry?
2. What are the factors contributing to the development of the skills of the workforce of firms in this industry?
3. Who are the players contributing to the development of skills for firms in the PIM Industry?
4. What are the roles of key institutions, such as government, research institutes, universities, industry associations, financial institutions, in providing support and training for this industry? And,
5. How to create sustainable skills knowledge clusters that have the capability to provide relevant training and mentorship that will lead the development of the industry to higher platform of competitiveness?

3.0 Industry Profile

The Malaysian PIM Industry can be divided into four end-use categories, namely:

1. Packaging
2. Electrical and Electronics
3. Automotive Components
4. Consumer and Industrial Products

The production of plastic products in Malaysia comprises three main processes which include injection moulding, film extrusion and blow moulding. The focus of this study is limited to the injection[5] moulding sector.

5 For detailed description of injection moulding refer to the website by Matrade: http://www.matrade.gov.my/en/foriegn-buyers-section/69-industry-write-up--products/521-plastic

4.0 Research Methodology

This study used descriptive analysis such as frequencies and charts to provide information on the current and future needs of human capital in the Malaysian plastics industry. Charts such as bar charts and stacked bar charts are used to analyse the data from a sample of 60 firms from the plastics injection moulding sector.

This study focuses on six key functional roles within the injection moulding sub-sector of the plastics industry, based on the types of skills required. The roles are listed below:

- **Finance**
  (Costing Personnel)
- **Technologist**
  (Product Engineer, Manufacturing/Industrial Engineer, CAD-CAM Engineer/Tooling Engineer, Project Engineer, Q.C./Q.A. Engineer, Electronics/Electrical Engineer, Technical Services Engineer, Moulding Engineer, Production Operations Manager)
- **Technician**
  (Supervisor/Foreman, Mechanical Engineering Technician, Electronics/Electrical Engineering Technician, Q.C./Q.A. Technician, Product/Packaging Development Technician, Laboratory/Materials Technician, Manufacturing/Industrial Engineering Technicians, Tooling Technicians, CAD-CAM Technician (Tooling), Production Planner)
- **Craftsman**
  (Team Leader, Electrician, Mould and Die Maker, Model/ Prototype Maker, Plastics Machine Setter, Quality Control Inspector)
- **Operative Worker**
  (Injection Moulding Machine Operator, Other Plastics Processing Machine Operator, Printing Operator, Assembler, Plastics Fabricator/Welder)
- **General Worker *(unskilled)***
  (Factory Worker; involved in manual work such as loading and unloading of goods, sprue removal, packing, etc.)

A structured questionnaire survey was used to collect information from respondents who are in the senior management of firms in the industry. The survey questions were designed to ensure brevity to minimise respondent fatigue. The survey takes approximately 25 minutes to complete. The questionnaire was sent to MPMA for feedback and comments on the clarity and conciseness of questionnaire items. Recommendations from MPMA were taken into account and incorporated into the final questionnaire. Two language versions of the questionnaire were developed: English and Chinese and are provided in Appendix-I. The questionnaire was structured into the following two key parts:

Part 1. Identify the nature of the business and the structure of existing workforce by scrutinising:

- Business size
- Product category
- Structure of workforce
- Age profile of workforce
- Educational profile
- Staff turnover rate
- Salary of the workforce by job function

Part 2. Gauge the current and future skills needs of the industry, by evaluating:

- Level of importance of skills enhancement
- Importance of skills for manufacturing and technical positions
- Percentage of learning taking place on the job
- Actions taken to overcome problems hiring skilled employees
- Profile of new hires in terms of level of difficulty to fill positions
- Involvement of stakeholders (which include Federal Ministry or Agency; Local or State Government; public university or research institute; private university or research institute; Non-governmental Organisation (NGO); industry associations; Financial institutions (including micro-finance); External training providers; Human Resource Development Fund (HRDF); Training and workshops organised by MPMA
- Critical job positions for the six key trades
- Staff training expenses
- Importance of training needs for the business
- Areas of development and future skills needs

5.0 Plastics Injection Moulding Industry Study: The Results

This study administered a survey of the injection moulding sub-sector of the plastics industry. MPMA assisted in distributing the survey questionnaire to the firms listed on their membership database. Data was also collected using Qualtrics software.[6] Companies sampled vary in terms of firm size as well as range of products manufactured. A total of 60 firms were used for the analysis.

5.1 Nature of Business and the Structure of Existing Workforce

This section provides a description of the business profile of firms surveyed in terms of the number of employees, product categories, structure of the workforce, age and level of education of workforce, average turnover rate and salary of the workforce.

5.1.1 Firm Size Based on Respondents Total Number of Employees

Q1. Please indicate total number of employees in your business.

The sample of firms surveyed comprises micro, small, medium and large businesses[7]. **Figure 1** shows that the majority of the firms (52%) are small firms (5-19 & 20-75), and 18% are medium sized firms (76-200). 23% of the firms surveyed are large firms (>201). On the extreme end of the distribution, the study also has firms with one to four employees; these firms are classified as micro firms and make up 7%.

5.1.2 Product Type

Q2. Please select your product manufactured category.

The results in **Figure 2** show that the most common plastic products manufactured in Malaysia come from the Packaging *(Containers, Bottles)* industry, closely followed by *Electrical and Electronic (E&E) Products, Original Equipment Manufacturing (OEM), Houseware, Kitchenware and Tableware, and Industrial Use Plastics.* 53% of these firms identified themselves as manufacturers. Notably, none of the firms surveyed reported manufacturing *Optical or Recreational* plastic products.

Figure 1:
Business size sampled based on headcount (in percentage)

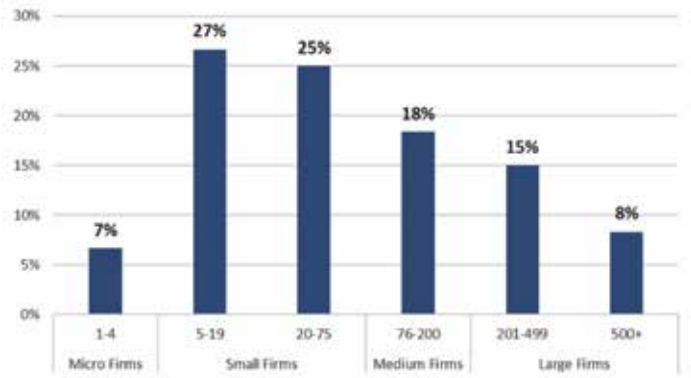
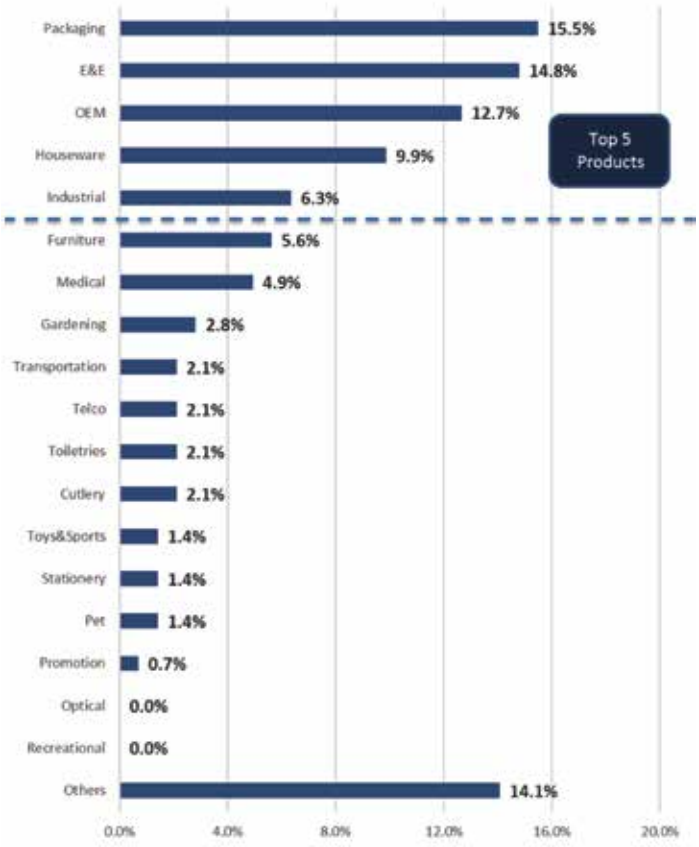


Figure 2:
Product type



6 Qualtrics software is a leading online survey tool provider used to gather feedback online.

7 Definitions (effective 1 January 2014) for Micro/Small/Medium(SMEs) and Large Businesses obtained from SME Corp Malaysia: Micro Firms (1-4), Small Firms (5-75), Medium Firms (76-200), Large Firms (201+)

Figure 3 identifies the different product types according to the size of firms. Small firms predominantly manufacture *Packaging* products (9.2%), while *E&E* products are equally spread between small and large firms (5.6%). *OEM* products are generally supplied by small and medium size firms (4.2%).

Figure 4 shows that the majority of firms surveyed specialise in manufacturing one or two product categories, which adds to a combined percentage total of 66.7%. Most firms engage in manufacture of a single product category, indicating they are highly specialised. In fact, firms manufacturing one to three product categories account for 81.7% of the total number. Firms that manage a more diverse portfolio of three to five product categories made up 28.3%. However, only 5.1% of firms manufactured seven or more product categories.

Figure 5 shows the number of categories manufactured according to the size of firms. For both small and large firms, though the number of categories manufactured are spread across the range, the majority of firms are focused in the manufacturing of one to three product categories. While for micro and medium firms, there is no strong preferences in any single categories manufactured.

5.1.3 Structure of Workforce

Q3. What is the structure of your current workforce?

According to the results in **Figure 6.1**, 62% of employees of the firms surveyed were *Operative Workers*. The next most hired category of employees are *General Workers (Unskilled)* and *Technicians*, both at 11% each. *Craftsman, Technologist,* and *Finance* are at 9%, 5%, and 3% respectively.

Figure 6.1 compares the percentage of functional roles hired and sizes of firms on the industry level. The figure shows there were significant differences for the more technical roles. Across the *Operative Worker, Craftsman, Technician, and Technologist* roles, large firms consistently hired more than SMEs. In reference to **Figure 6.2**, of the 9% of

Figure 3:
Product types per size of firms (N = 142)

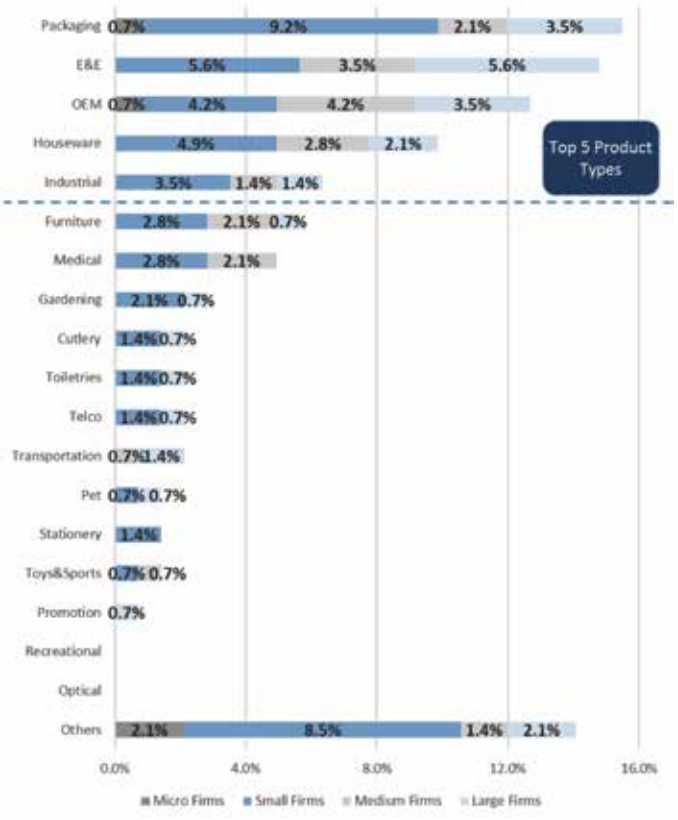


Figure 4:
No. of product categories manufactured

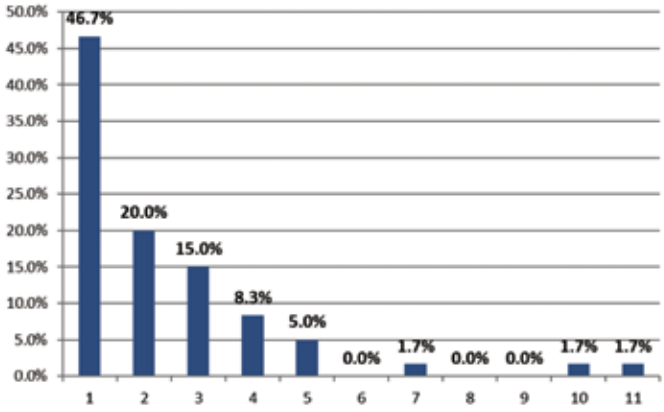
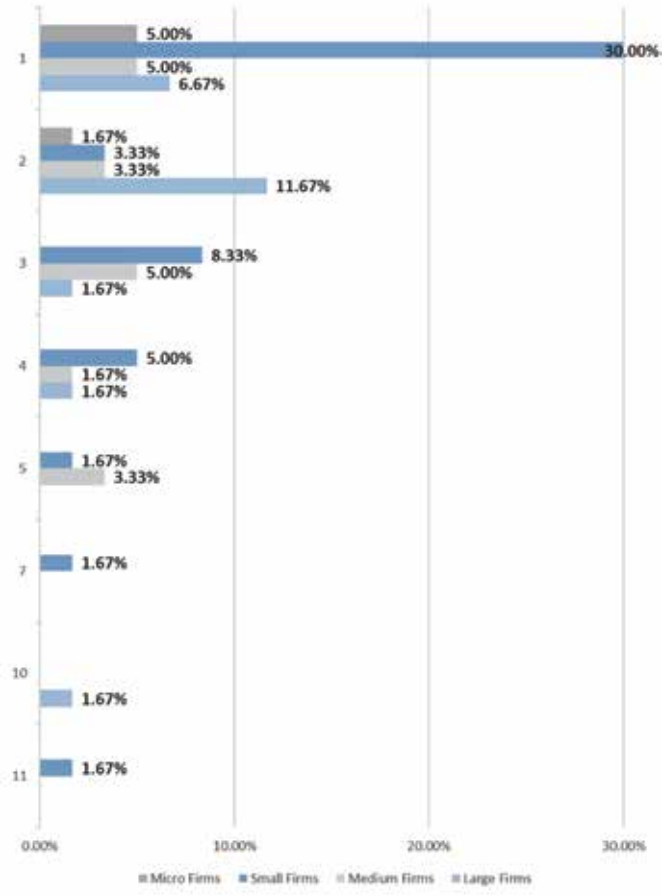


Figure 5:
No. of product categories produced per size of firms



Craftsman hired, 84% were by large firms; similarly, of the 5% of *Technologists* hired, 74.9% were also by large firms. This suggests a technological gap between SMEs and large firms and may point to a lack of support for SMEs to engage in more advanced manufacturing processes and products.

Figure 6.1:
Percentage of employees per functional role

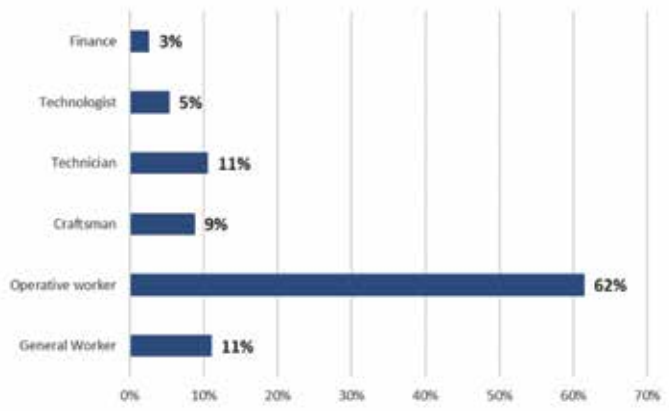


Figure 6.2:
Percentage of employees per functional role and size of firms (Industry level) (N = 8396)

Figure 6.3:
Percentage of employees and size of firms (Firm Level) (N = 8396)

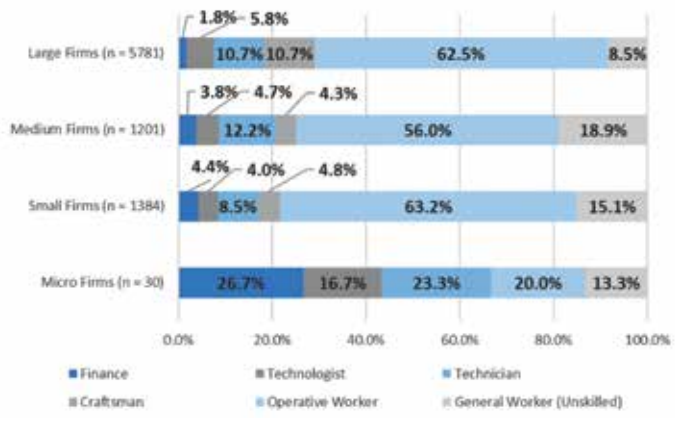


Figure 6.3 looks at the percentage of employees at the firm level. The figure shows that micro firms have a fairly even spread of employees across each of the roles, whereas small, medium, and large firms have a larger emphasis (>50%) on *Operative Workers*. Large firms also hired significantly less *General Workers* compared to the other firm sizes. It is interesting to note that micro firms hired more of the technical roles *(Technologists and Technicians),* though this could be skewed by the small sample size relative to the other firm sizes.

In general, all firms surveyed show strong preference for full-time employees. **Figure 7** shows that full-time employees are overwhelmingly preferred for roles in *Finance* (97.7%), *Technologists* (99.8%), *Technicians* and *Craftsman* (100%). Part-time employees comprises 9.4% and 16.6% of *Operative Workers* and *General Workers* respectively. This shows the industry to be dominated by full-time workers, with part-time work being only a marginal activity.

Similarly, local employees dominate positions in *Finance* (99.5%), as well as *Technologists* (97.8%), *Technicians* (92.5%) and *Craftsman* (67.8%) **(See Figure 8)**. However, foreign employees are the favored category for *Operative Workers* (61.9%) and *General Workers* (68.3%). There is a sizeable presence of foreign worker in low skill areas.

Figure 7:
Full-time and part-time local staff distribution

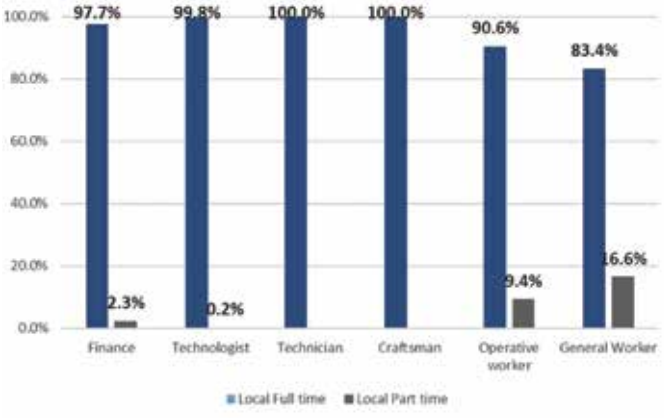
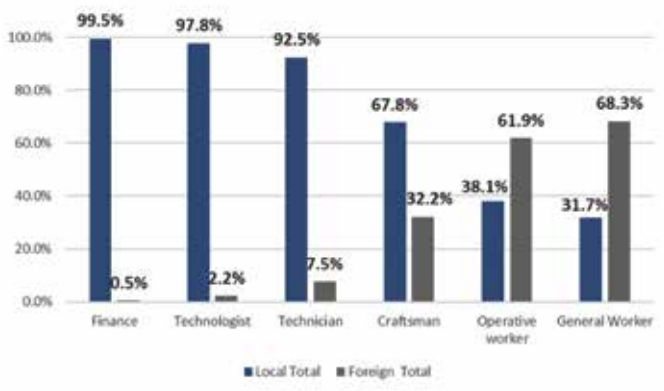


Figure 8:
Local and foreign distribution of workforce



5.1.4 Age Profile of Workforce

Q4. What is the age profile of your current workforce (in percentage)?

Data in **Figure 9** shows the number of firms surveyed who indicated a workforce of greater than 50% for a particular age group. There is clear preference for young adult employees (age 18-35) for the roles of *General Worker, Operative Worker,* and *Craftsman*. For the *Technician, Technologist,* and *Finance* roles, there is a slight preference for older employees (age 36-55).

Roles that require lower entry level skills are largely held by young adults; a large proportion of this figure can be attributed to foreign workers who have basic education and work in less qualified jobs (see Section 5.1.3). Roles requiring higher skills and experience (*Finance* and *Technologists*) are occupied in greater proportion by older employees relative to younger workers.

5.1.5 Education Level

Q5. Please indicate typical education level for each position.

As expected, 74.1% and 63.7% of *Finance* and *Technologist* employees hold at least a Diploma, with 41.6% and 41.9% respectively holding Undergraduate Degrees or above (see **Figure 10**). 58.5% of *Technicians* completed a Vocational or Diploma Certificate, whereas only 35% of *Craftsmen* had done so. The bulk of *Craftsmen* and *Operative Workers* had an Upper Secondary education, at 40% and 66% respectively. *General Workers* comprise exclusively Lower and Upper-Secondary school level employees, at 62% and 38% respectively.

The significant reliance on upper-secondary employees for *Operators* highlights the need to offer apprenticeships and alternative vocational pathways at the secondary school level to equip workers with the necessary core skills. While on-the-job learning (refer to Section 5.2.4) remains the dominant route to upskill employees in Malaysian firms, it is proving to be inadequate for the current dynamic and rapidly changing environment. In the long run, such deficiency will create significant bottlenecks in the manufacturing processes.

Interestingly, **Figure 10.1** shows that Upper Secondary school level employees make up 31.1% of the workforce of the Malaysian PIM Industry, almost 50% more than the next highest category. To some extent, this is suggestive of a lack of incentives or opportunities to transition into Vocational (12.6%) or Diploma (17.1%) where relevant skillsets could be developed.

Figure 9:
Age distribution (in percentage)

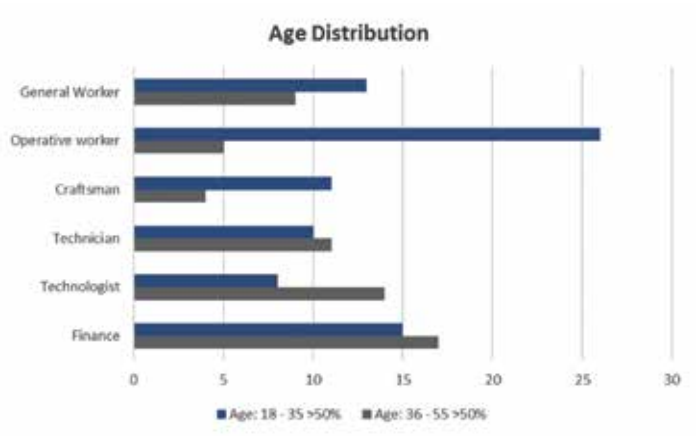


Figure 10:
Work force qualification according to the six key trades

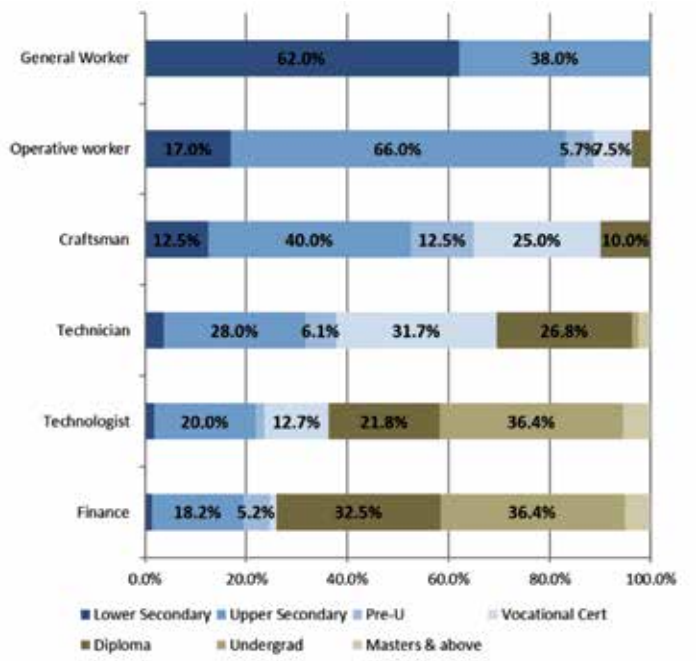


Figure 10.1:
Workforce qualification according to education level

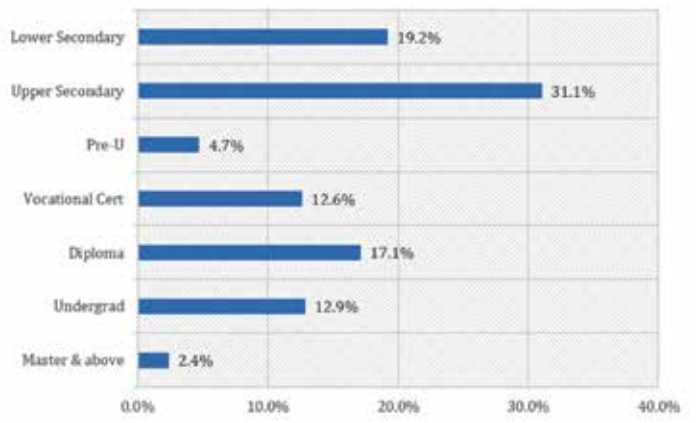


Figure 10.2 breaks down workforce qualifications at the industry level. Of the 31.1% of *Upper Secondary* hired, it is clear that small firms employed the majority at 55.9%. For *Pre-U* and *Lower Secondary,* 61.1% and 49.3% were in small firms Surprisingly, there were no significant differences between the percentage of employees hired for *Masters & above* between micro, small, and large firms[8].

Figure 10.3 looks at workforce qualification at the firm level. The figure shows that as firm size increases, the education level of the workforce increases as well. Despite this, there is still an overwhelming reliance on Upper Secondary or below levels of education for all firm sizes. As expected, large firms have the highest levels of *Diplomas* (25.0%), *Undergrads* (15.0%), and *Masters & above* (3.0%).

5.1.6 Staff Turnover Rate

Q6. What is the average rate of worker turnover in 2015?

Overall, there is a low staff turnover across all job functions, as shown in **Figure 11.1**. For the roles: *Craftsman, Technician, Technologist,* and *Finance,* more than 85% of firms report a turnover of less than 10%. There is however, a relatively higher staff turnover for *Operative* and *General Workers*. 24.5% and 12.2% of firms reported a 10 to 30% turnover for *Operative* and *General Workers* respectively. Furthermore, 9.4% of firms indicated more than 30% turnover for *Operative Workers* and 14.6% for *General Workers*.

Whilst the high turnover rate for unskilled *General Workers* is unsurprising, the slightly higher turnover rate for *Operative Workers* is a cause for concern. *Operators* are the backbone of any manufacturing industry (as indicated in Section 5.1.3), thus retaining them is key to efficiency and good function of production processes.

8 This may be due to the small number of responses for the Master & above option (n = 9).

Figure 10.2:
Workforce qualification according to education level and size of firms (Industry Level)

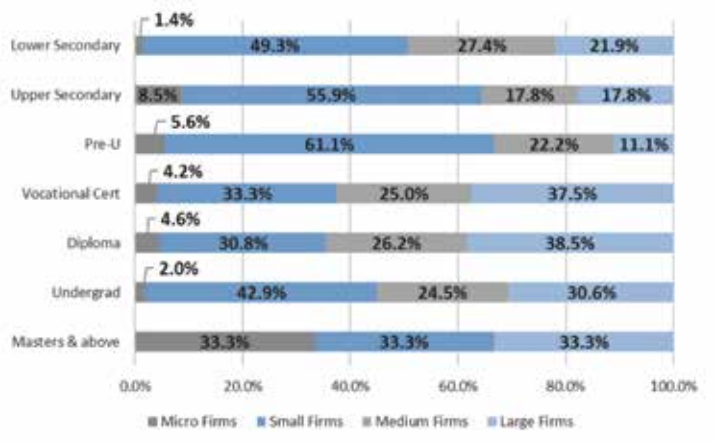


Figure 10.3:
Workforce qualification according to education level and size of firms (Firm Level)

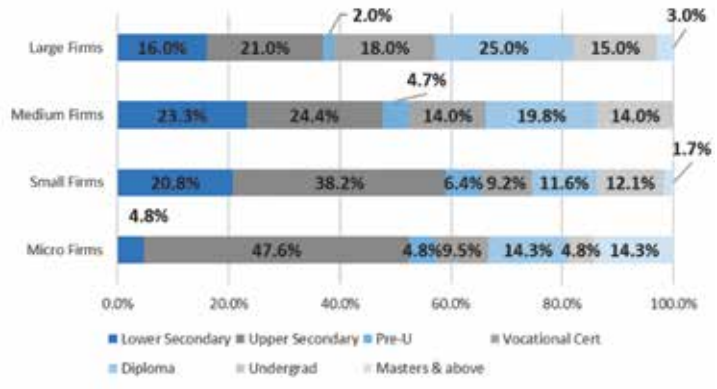


Figure 11.1:
Percentage of staff turnover by job function in 2015

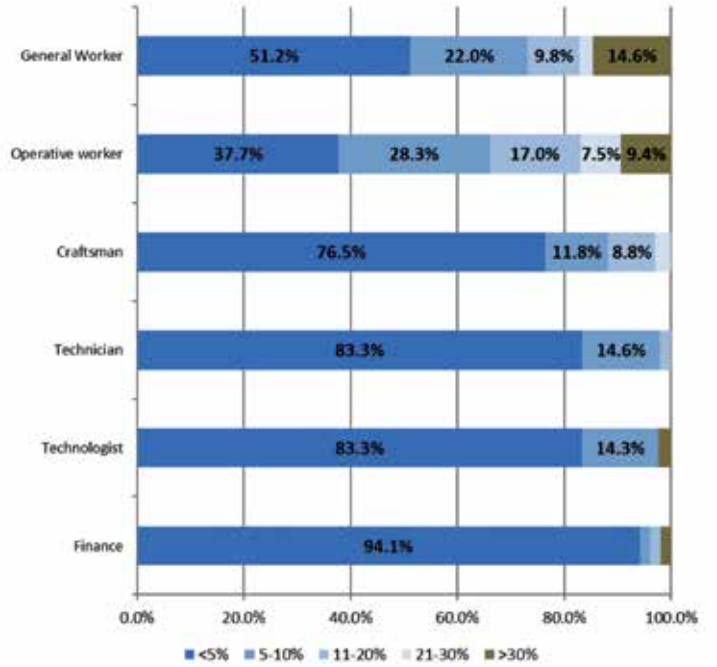


Figure 11.2 looks at the percentage of staff turnover at the firm level. The figure shows that at the <5% turnover range, large firms are the most stable at 78.2% while medium and small firms are the least stable at 59.7% and 60.0% respectively. For the >30% range, small firms have the highest percentage of staff turnover at 7.6%. This suggests that small firms are struggling to hold on to their employees.

5.1.7 Monthly Income Range of Employees by Job Functions

Q7. Please indicate average salary per month for each position.

The average salary reported in **Figure 12.1** is higher for *Finance* and *Technologist* roles, where 60.8% and 74% of firms allocated a salary of more than RM3,000 per month respectively. At the lower end of the spectrum, average salaries for *Operative* and *General Workers* are RM2,000 and below.

Figure 12.2 shows the percentage of salary ranges on the industry level. It is interesting that small firms were the majority for all salary ranges, suggesting that small firms need to pay a premium to attract talent. Furthermore, micro firms seem to be offering high salaries (RM6,001 & above) at a similar rate

Figure 11.2:
Percentage of staff turnover per size of firms in 2015 (Firm Level)

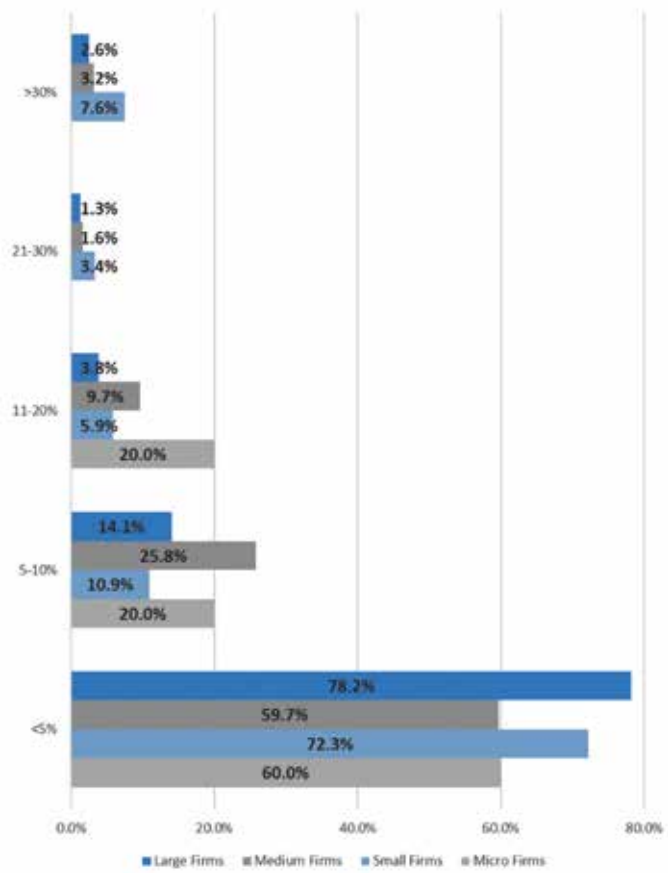


Figure 12.1:
Average salary by job function

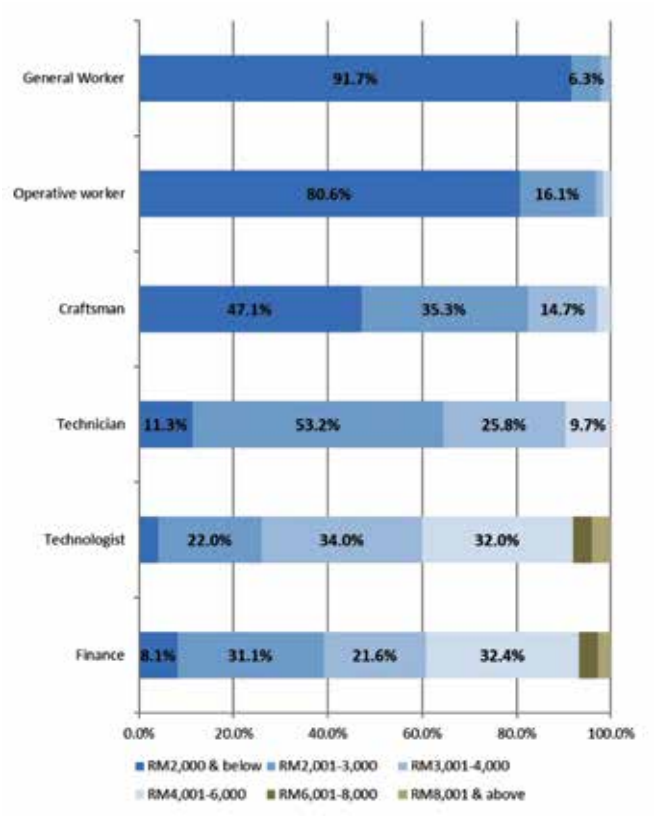


Figure 12.2:
Average salary and size of firm (Industry Level)

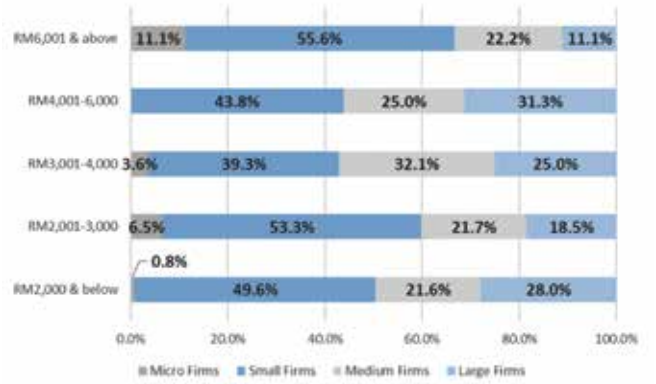
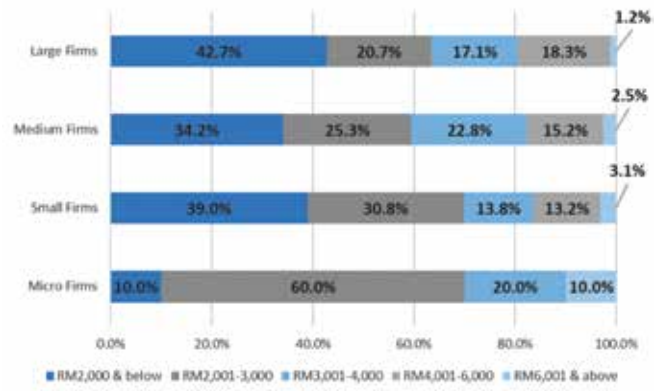


Figure 12.3:
Average salary and size of firm (Firm Level)



to large firms (11.1%). This is not surprising given that in Figure 10.3, micro firms have the highest percentage of employees with Masters & above qualifications (14.3%) and these highly educated employees are able to command higher salaries.

Figure 12.3 shows that at the firm level, there are only slight differences in the average salary ranges paid by each firm size, with the exception of micro firms where the bulk of the workforce are paid within the RM2,001-3,000 range; thought this could be skewed by the small sample size.

Figure 12.4 compares the ability to recruit skilled employees based on the average salary range. It appears there is a slight decrease in difficulty to recruit skilled employees as the salary range moves up from *RM2,000 & below* to the *RM3,001-4,000* range. From the *RM4,001-6,000* and above range though, it seems that offering higher remuneration does not alleviate the skills shortage. This indicates that though firms are ready to pay for talent, there is a lack of supply, especially for the more technical roles that are able to command a higher salary range.

5.2 Current and Future Skills Needs of the Industry

This section provides detailed information on the current and future skills needed for the PIM industry in Malaysia. The descriptive analysis answers the key research questions identified in the earlier section:

- What are the skills gap of firms in the sector?
- What are the factors contributing to the development of the skills of the workforce of firms in this industry?
- Who are the players contributing to the development of skills for firms in the PIM industry?
- What are the roles of key institutions such: government, research institutes, universities, industry associations, financial institutions ? And
- How to create sustainable knowledge clusters that have the capability to provide relevant training and mentorship that will foster economies of scale and scope to empower this industry?

5.2.1 Importance of Skills Enhancement for Business Competitiveness

Q8. How important is skills enhancement to your business competitiveness?

Results in **Figure 13.1** show that all of the firms surveyed recognise the importance of skillset enhancement. 46.7% of these firms rated it as of *High Importance*, 33.3% rated it as of *Very High Importance* and 20% rated it as *Moderate Importance*. This shows that firms value employee training and are committed to updating their workforces' skillset in order to meet current market demands.

Broken down by firm size, **Figure 13.2** shows that small firms in particular place extra emphasis on skillset enhancement. The majority of firms that responded *Very High Importance* (16.7%) and *High Importance* (23.3%) were *small firms*.

Figure 12.4:
Average salary by ability to recruit skilled employees for business

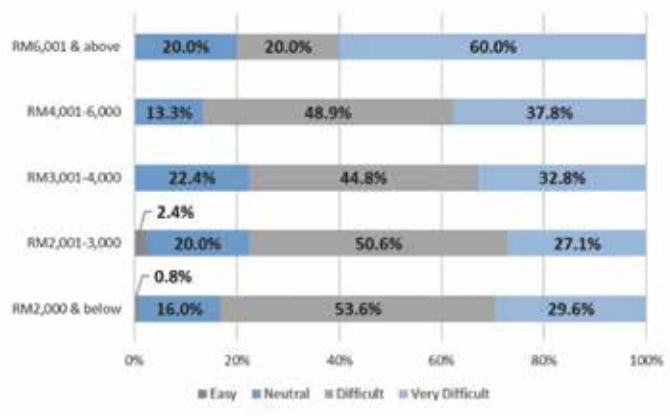


Figure 13.1:
Skillset enhancement importance

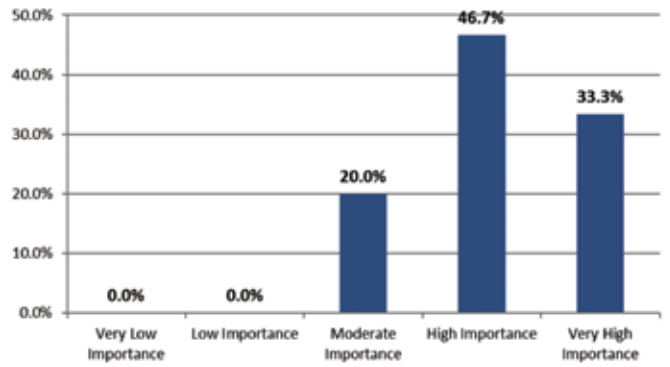
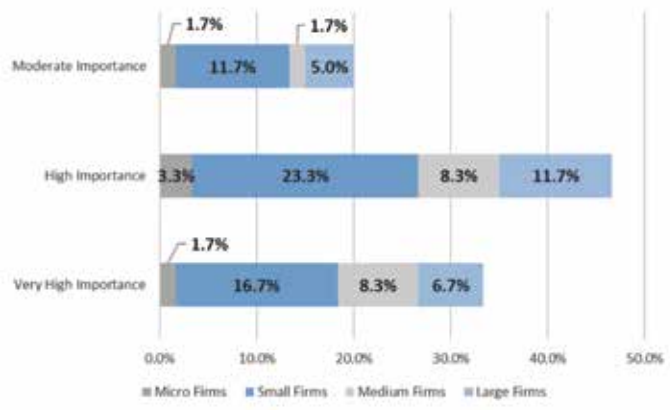


Figure 13.2:
Skillset enhancement importance per size of firm



5.2.2 Ability to Recruit Skilled Employees for Business

Q9. How difficult is it to recruit skilled employees in your business?

Figure 14.1 shows that a total of 77% of firms surveyed found it *Difficult* or *Very Difficult* to recruit skilled workers, while only 2% found it *Easy* or *Very Easy*. The industry's struggle to hire skilled workers is a clear indication of a skills gap between employees and their role demands. This is a critical problem that currently plagues the Malaysian plastics industry and is one of the chief reasons holding it back from progressing into an automated industry. As global competitors start to move to an even higher level of competitiveness through the use of emerging platforms, such as Industry 4.0, it becomes even more critical for the Malaysian PIM industry to bridge the skills gap.

Figure 14.2 looks at how size of firms affect their ability to recruit skilled employees. As expected, *small firms* have more difficulty in hiring skilled employees, with 41.7% of respondants report that it is *Difficult* or *Very Difficult* being *small firms*. Only 3.3% of firms that stated it was *Very Difficult* to hire skilled employees were *large firms*. 1.7% of reponses said it was *Easy* and were *micro firms*, possibly because they do not wish to grow beyond their current operations.

Figure 14.1:
Ability to recruit skilled employee

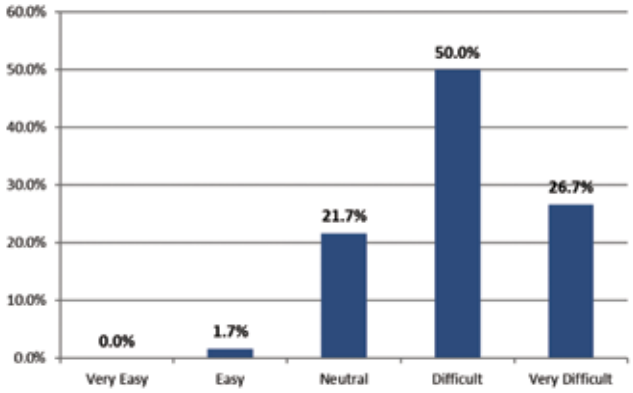


Figure 14.2:
Ability to recruit skilled employee per size of firms

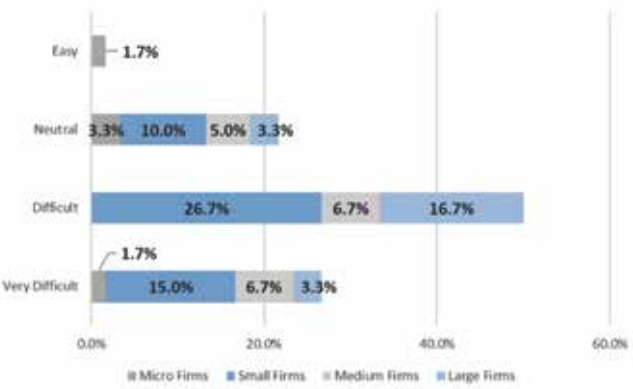


Figure 15 shows the relation between the responses for importance of skills enhancement for business competitiveness and ability to recruit skilled employees for business (5.2.1 and 5.2.2). 13.3% of firms that rated skill set enhancement as *Very High Importance* also found it *Very Difficult* to recruit skilled employees; 16.7% found it *Difficult*. 10% of those that rated it as *High Importance* found it *Very Difficult* while 21.7% found it *Difficult*. This suggests that while employers might be committed to upgrading the skill sets of their workforce, the difficulty in finding quality candidates to hire is an obstacle.

5.2.3 Importance of Specific Skills for Manufacturing and Technical Positions for Business

Q10. Please specify the importance of the following skills for manufacturing and technical positions in in your business.

There is general agreement among 49.1 % of the firms surveyed that *Chemical Engineering Technology* is not a pressing deficiency for their immediate competitiveness whilst 10.9% felt it required by them but not adequately available for them at the level of quality they required (see **Figure 16**). In contrast, more than 30% of firms indicated that there is a satisfactory level of employees' skills (required and adequate) in *Process Control/ Automation* (33.3%), *Electrical/Mechanical Technology* (36.8%), and *Maintenance* (42.9%). More worryingly, only around 20% of firms indicated there are enough skilled workers for *Production* (19%) and *Manufacturing Engineering Technology* (22.6%). These same roles also have the highest anticipated need into the future of more than 15% each; and around 30% of firms indicating they would like to possess such skillsets. **Figure 16** also suggests a significant skill gap for the roles of production and manufacturing engineers while a moderate skill gap exists for employees in process control/automation. With the industry shifting focus towards more sophisticated products and more efficient methods to produce them, firms have started to recognise the need for more engineering and high-level design roles in order to capture the higher end of the value chain. Despite this, the data suggests that firms are hamstrung by the lack of talent when it comes to transitioning into technological advanced manufacturing.

Figure 15:
Difficulty in attracting suitably qualified workers

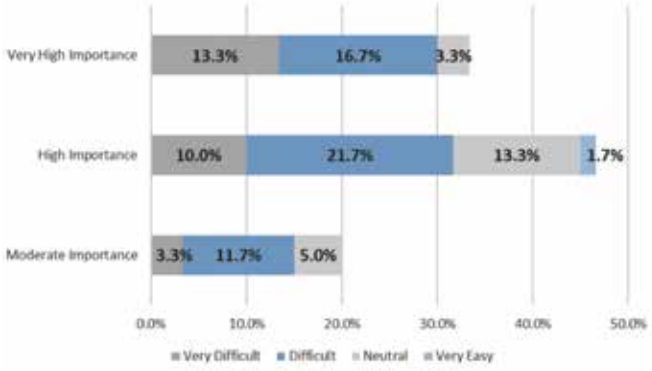


Figure 16:
Technology skillset required by industry

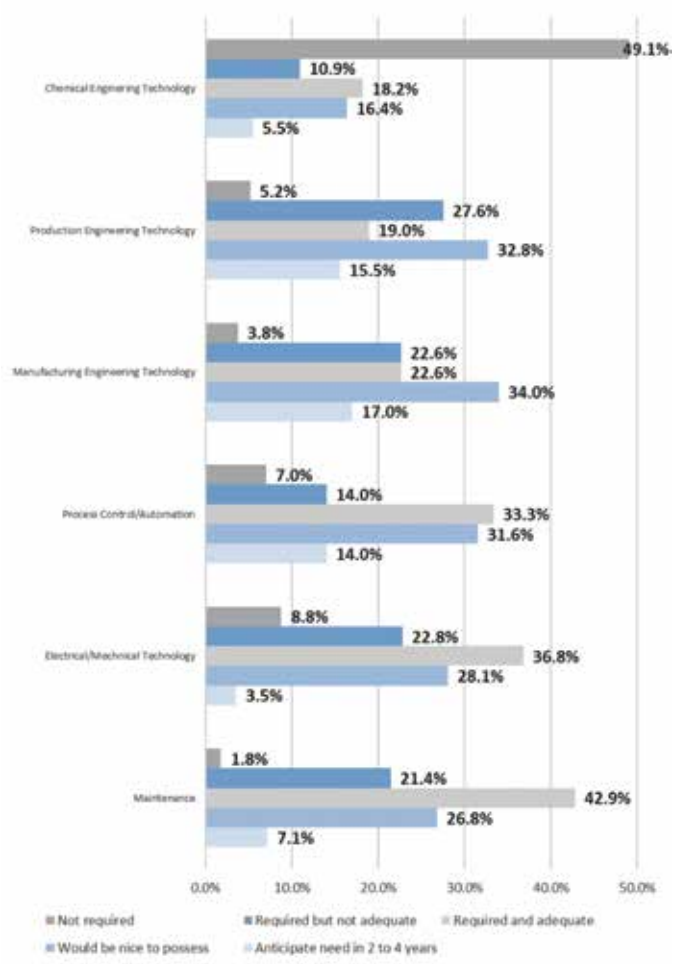


Figure 17.1:
Skills required and adequate supply

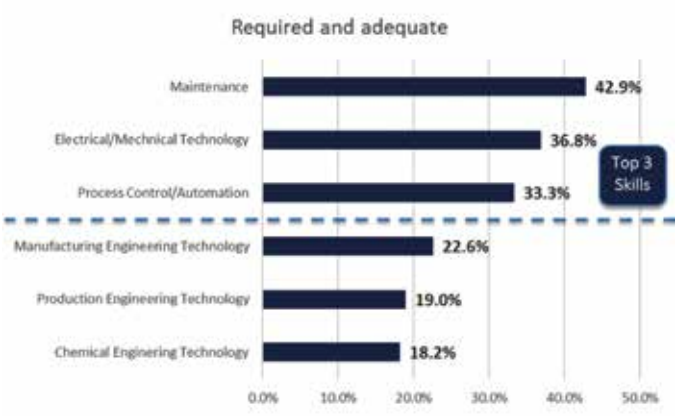
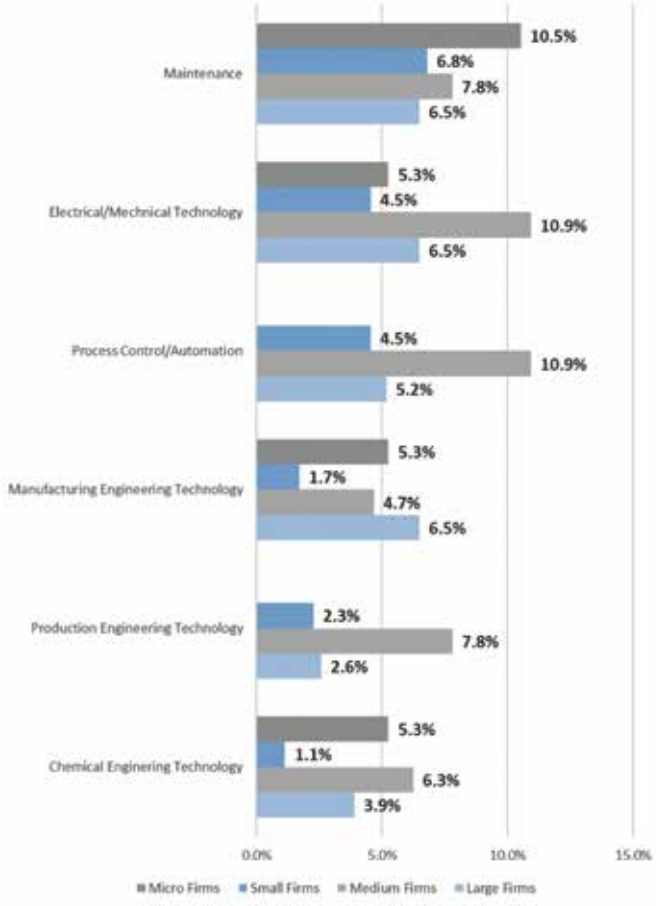


Figure 17.2:
Skill required and adequate supply per size of firm



Figures 17.1, 17.2, 18.1 and **18.2** show a further breakdown of the skills gap analysis within the industry. **Figure 17.1** highlights the top three skill sets that firms are adequately sourcing. At the top of the list is *Maintenance* at 42.9%. Following that, 36.8% and 33.3% of firms report that there is an adequate supply of employees skilled in *Electrical/Mechanical Technology* and *Process Control/Automation*. While these roles are in the top three, the data does indicate much room for improvement towards bridging the skills gap in the industry.

Figure 17.2 shows that *Small* and *Large Firms* experienced a slight shortage of *Production Engineering Technology*, with only 2.3% and 2.6% respectively stating that there is adequate supply. Whereas for Small and Medium Firms, their concern lies with *Manufacturing Engineering Technology* where only 1.7% and 4.7% stated respectively that it is adequate. *Small Firms* also do not find *Chemical Engineering Technology* skills to be in adequate supply (1.1%).

Figure 18.1 highlights the top three critical skill sets that firms are struggling to find amongst employees. Most firms indicated that there is shortage of *Production* (27.6%), *Electrical/Mechanical* (22.8%), and *Manufacturing Engineers* (22.6%) which represent the more technical roles within the company. The talent vacuum in these roles is a possible reason for the continued strong presence of the sector in low complexity plastic products (e.g, basic packaging) and constraint in moving to higher value plastics within Malaysia.

Figure 18.1:
Critical skills sets required by the industry

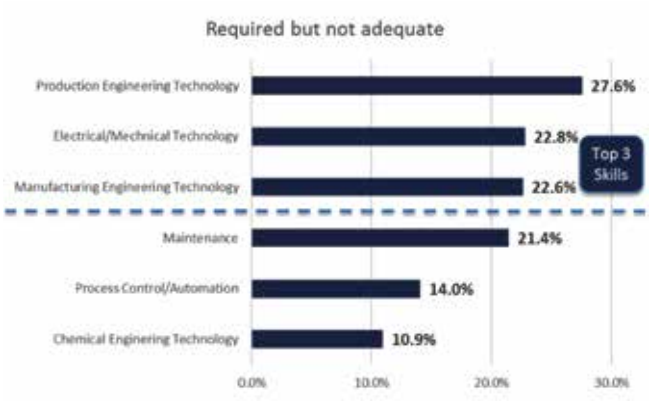
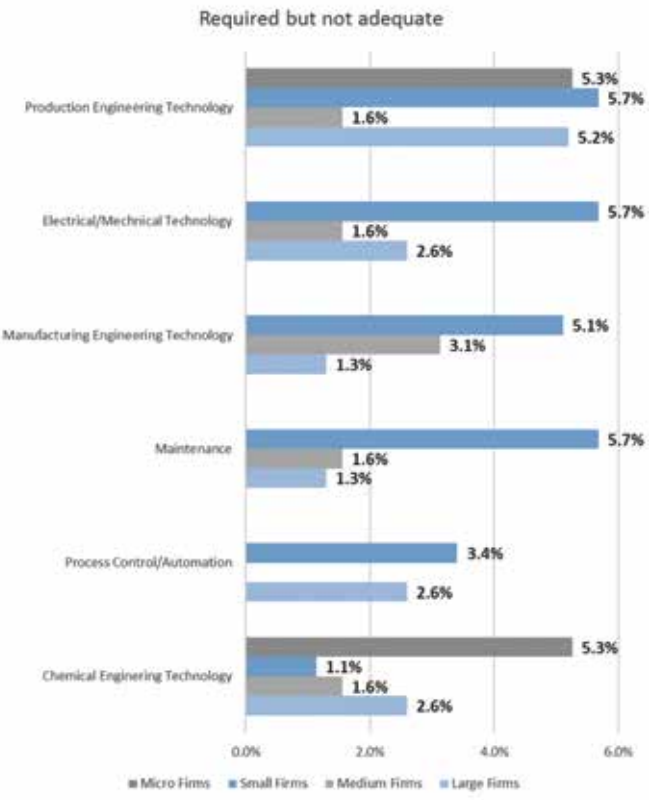


Figure 18.2 highlights the critical skill sets of each firm size. For *Micro Firms*, it appears that their biggest shortage is in *Production Engineering Technology* (5.3%) and *Chemical Engineering Technology* (5.3%); though this could be skewed by the small sample size. Consistent with **Figure 17.2**, *Medium firms* reiterated a skills shortage for *Manufacturing Engineering Technology* (3.1%). Similarly for *Large Firms*, the largest percentage was for *Production Engineering Technology* (5.2%). *Small firms* seem to struggle equally for skills across all of the options (around 5.7%), with the exception of *Chemical Engineering Technology* (1.1%).

Figure 18.2:
Critical skills sets required by the industry by size of firm



5.2.4 Learning On-the-Job

Q11. What percentage of learning occurs on the job? In other words, other than formal qualifications and certificates, how much learning do your employees undertake during the course of their jobs?

Figure 19 provides a more detailed breakdown for on-the-job training in the PIM industry for the different job functions. Technicians and technologists receive the highest on-the-job training. The remaining have relatively lower on-the-job training. This may be due to several reasons, and among them include:

- Lack of adequate training for these workers;
- Lack of mentors and apprenticeship programmes; and,
- Lack of a sharing culture among the workforce

Figure 19:
On-the-job learning by key trades

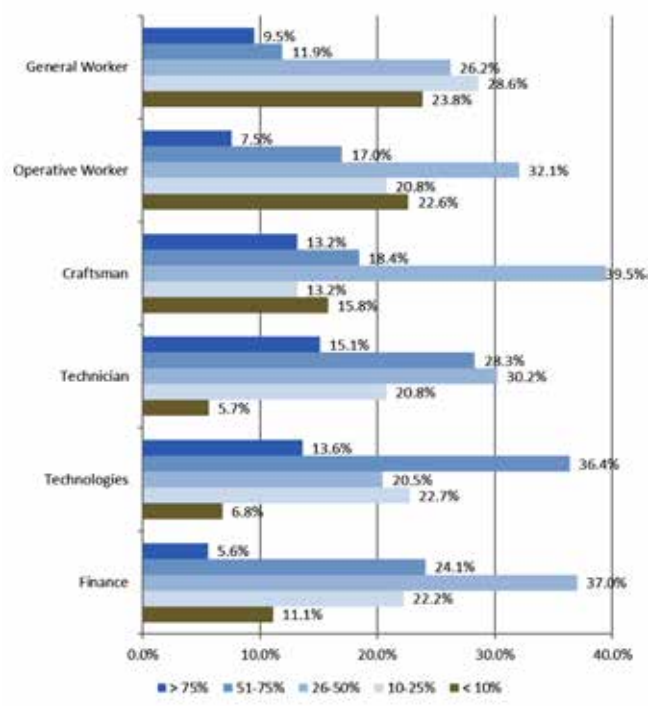


Figure 20.1:
Percentage of on-the-job learning by General Worker and size of firms (N = 42)

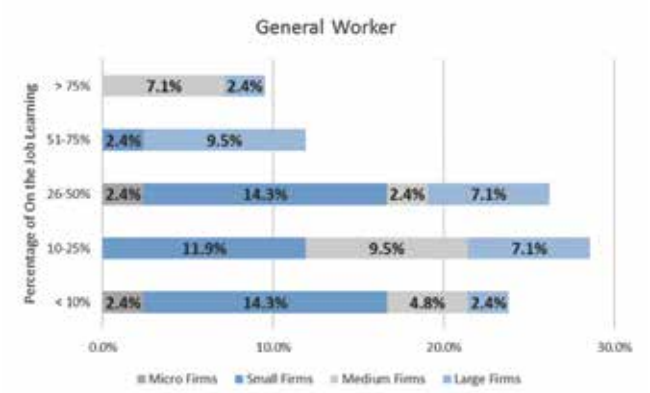


Figure 20.1 shows that 40.5% of firms reported less than 50% of on-the-job learning for *General Workers* and were *Small Firms*. Of which, 11.9% of firms reporting more than 50% of on-the-job learning were *Large Firms*.

For *Operative Workers*, **Figure 20.2** shows that 45.4% of firms reporting less than 50% of on-the-job learning were *Small Firms*. 9.4% of firms reported 51-75% on-the-job learning and were *Large Firms*.

Figure 20.3 shows that 35.8% of firms reporting less than 50% of on-the-job learning for *Craftsman* were *Small Firms* while 18.4% of firms reporting more than 50% of on-the-job learning were *Large Firms*.

Figure 20.4 shows that 35.9% of firms reporting less than 50% of on-the-job learning for *Technicians* were *Small Firms* while 15.1% of firms reporting more than 50% of on-the-job learning were *Large Firms*.

Figure 20.5 shows that 29.5% of firms reporting less than 50% of on-the-job learning for *Technologists* were *Small Firms* while 18.1% of firms reporting more than 50% of on-the-job learning were *Large Firms*.

Figure 20.2:
Percentage of on-the-job learning by Operative Worker and size of firms (N = 53)

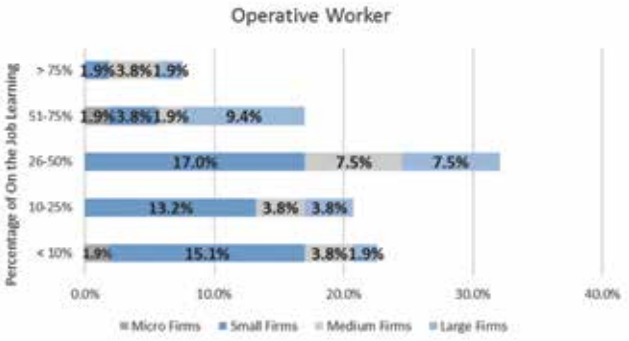


Figure 20.3:
Percentage of on-the-job learning by Craftsman and size of firms (N = 38)

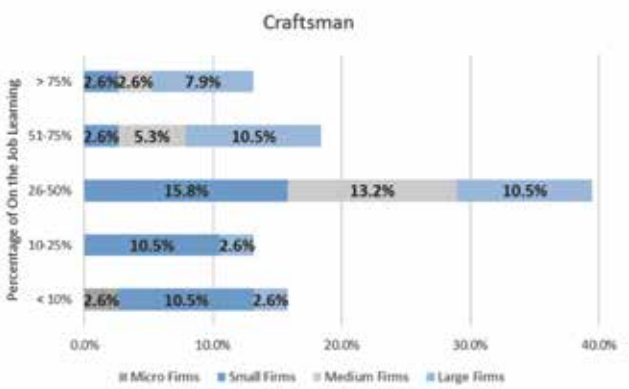


Figure 20.4:
Percentage of on-the -job learning by Technician and size of firms (N = 53)

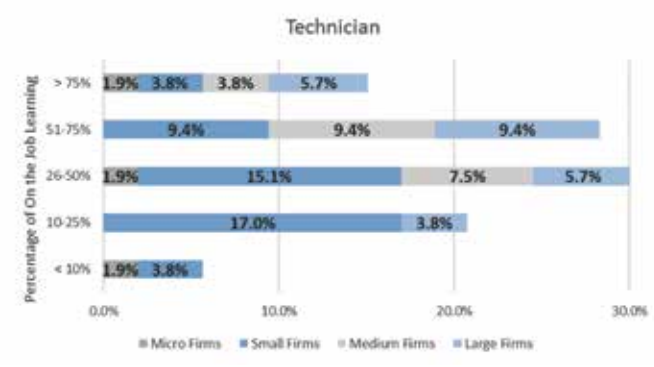


Figure 20.5:
Percentage of on-the-job learning by Technologist and size of firms (N = 44)

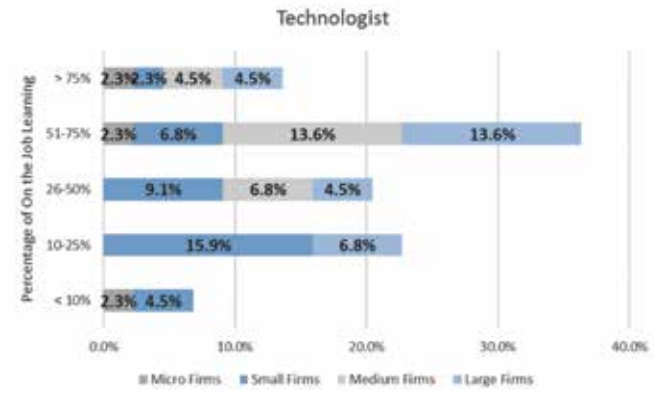


Figure 20.6:
Percentage of on-the -job learning by Finance and size of firms (N = 54)

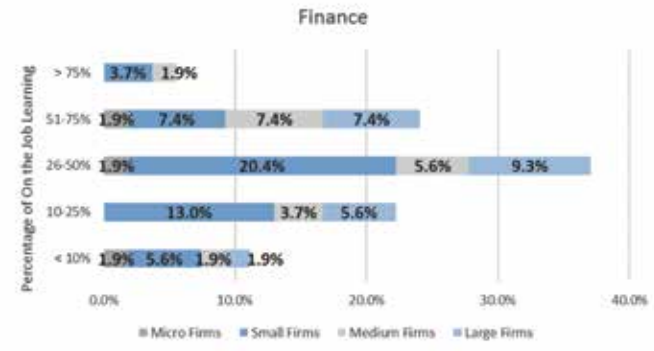


Figure 20.6 shows that 39.0% of firms reporting less than 50% of on-the-job learning for *Finance* were *Small Firms* while the percentage of firms that reporting more than 50% of on-the-job learning were 11.1% (*Small Firms*), 9.4% (*Medium Firms*), and 7.4% (*Large Firms*).

Figure 21.1:
Actions taken to overcome problems in obtaining skilled employees

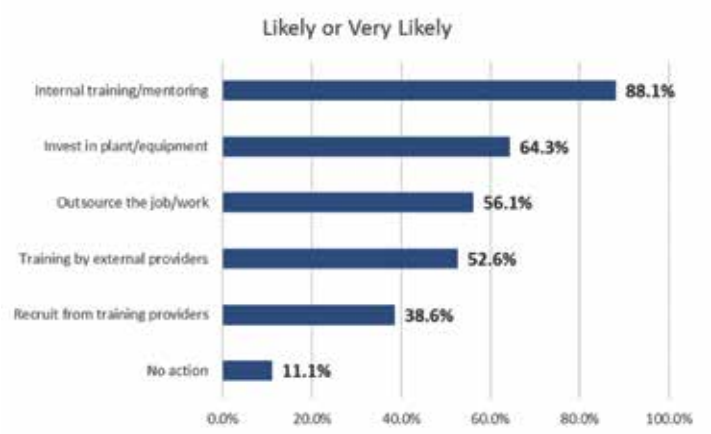
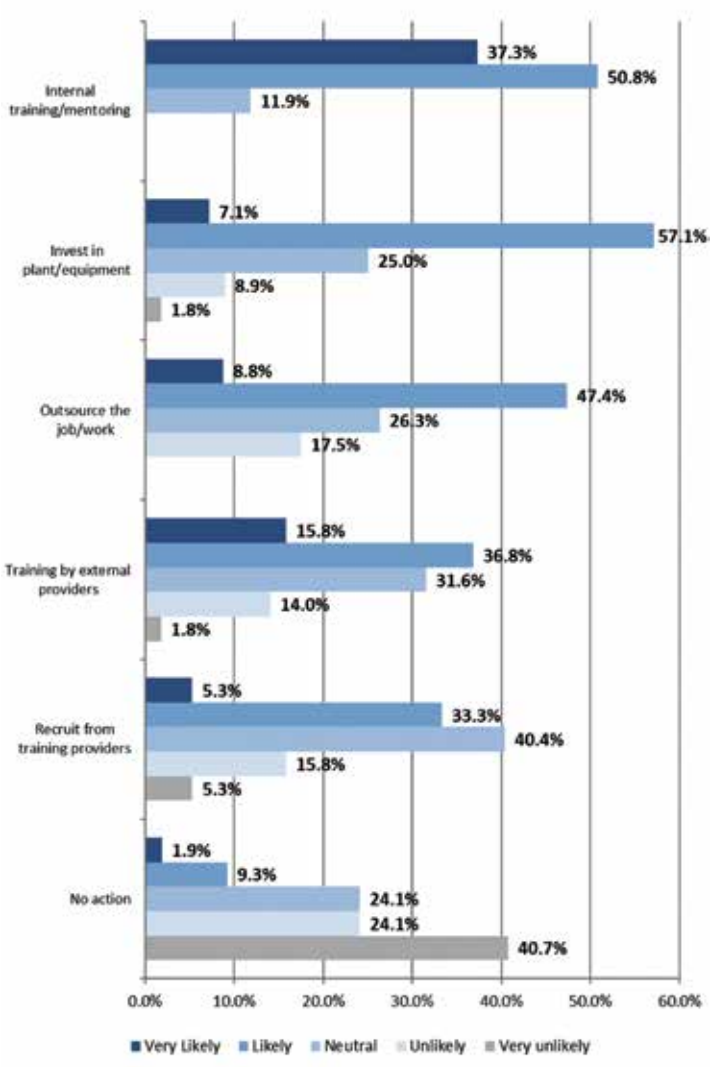


Figure 21.2:
Breakdown of actions taken to overcome problems of obtaining skilled employees



5.2.5 Action Taken to Overcome Problems Obtaining Skilled Employees

Q12. What action is your business likely to take to overcome problems obtaining skilled employees?

Firms faced with a shortage of skilled employees respond by taking some form of action to address the issue, with only a small percentage (11.1%) resigning to their predicament without action, as shown in **Figures 21.1** and **21.2**.

The results also show that the most likely course of action to bridge the skills gap is internal training/ mentoring (88.1%), followed by investment in plant/ equipment (64.3%) and outsourcing (56.1%). It is evident that most firms prefer employees to learn on-the-job in order to upskill. This may be viable for SMEs, but sole reliance on this may not be sustainable for larger firms, especially those wishing to proactively keep pace with technological advancements in the industry.

Sole reliance or excessive reliance on on-the-job learning can potentially lead to a sluggish workforce, if the on-the-job learning process is slow and incrementally introduced. Within a rapidly changing production environment, the lag time between adopting new technology and efficiently utilising it potentially leads to a more reactionary business approach which impedes innovation and the ability to stay ahead of competitors. There needs to be greater collaboration with educational institutes to ensure greater proportions of employees are ready for the varied demands presented by shifts in market and industry.

5.2.6 Skill Gaps Across the Positions

Q13. Have you hired or attempted to hire for the following positions in the last six months? If YES, please specify the number of people you are seeking and indicate the difficulty in attracting qualified candidates for each of the position.

Figure 22 shows the roles that firms attempted to hire for in the last six months. At the top of the chart are *Injection Moulding Machine Operators* at 50%, followed by *Q.C./Q.A. Technicians* at 41.8% and *Supervisors/Foremen* at 39.7%.

Figure 23.1 shows that of the 28.6% of firms that tried to hire for the role of *Finance*, 27.8% found the level of skills to be below expectations and 22.2% stated that it was difficult to find quality applicants.

Figure 22[9]:
Roles that firms attempted to hire for in the last six months

Figure 23.1:
Level of skills and availability for Finance

Interestingly, **Figure 23.2** also shows that of the 31.4% *General Workers* hired, 36.8% were below expectations and 10.5% said it was difficult to find qualified applicants. This may be a sign of firms trying to transition into more sophisticated plastic products but are held back by the lack of talent in the worker pool. It also highlights the limitations of firms' reliance on low-skilled workers to save on labour cost while trying to leap frog into the higher value end of the manufacturing chain.

9 Colour for key trades: Finance, General Worker (Unskilled), Technologist, Technician, Craftsman, Operative Worker.

Figure 23.3 highlights the limiting factor within the *Technologist* role to firms' competitiveness. 63.2% of firms that hired *Q.C./Q.A. Engineers* found their level of skills to be below expectations, followed by 57.1% for *CAD-CAM Engineer/ Tooling* and 45.5% for *Product Engineers (Plastics)*. Of concern is the category *Electronics/Electrical Engineers*, where 100% of firms which tried to hire experienced difficulty in finding quality applicants. This indicates a shortage in the quality and quantity of engineers which could be addressed by coordination with education institutes and training providers. Lack of proper quality assurance for manufacturers could potentially compromise the reliability and perception of the end products.

Figure 23.2:
Level of skills and availability for General Worker (Unskilled)

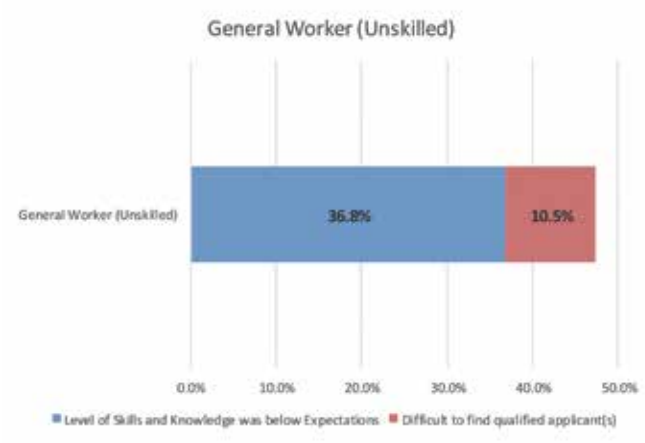


Figure 23.3:
Level of skills and availability for Technologist

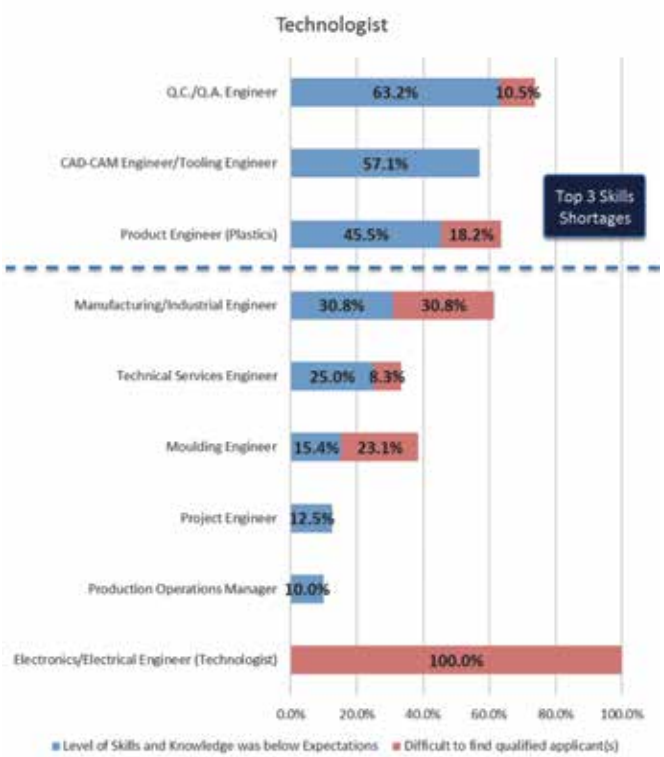


Figure 23.4 focuses on the quality of Technicians hired in the past six months. Of the 41.8% of firms that tried to hire an *Q.C./ Q.A. Technician,* 53.8% reported that the level of skills were below expectations. This is followed by 37.5% for *Supervisor/ Foreman* and 36.4% for *Mechanical Engineering Technician*. For most of these roles, around 10% of firms indicated that it was difficult to find qualified applicants.

For the *Craftsman category* in **Figure 23.5**, it is evident that there is less of a skills mismatch where at least 70% of firms indicated the new employees had met or exceeded their expectations.

In **Figure 23.6**, Operators for *Plastics Processing Machines* were hard to fill, with 40% of firms indicating that it is difficult to find quality applicants and a further 40% stating that the level of skills of available employees were below expectations. For *Injection Moulding Machine Operators*, 12.5% were below expectations and a further 25% of firms reported that it was difficult to find qualified applicants. This is consistent across the other *Operator* roles, except for *Plastics Fabricator/Welder*, where around 25% of firms reported below expectations skill levels and another 25% found difficulty in finding quality applicants. This seems to indicate that there is insufficient skilled *Operators* in the industry.

Figure 23.4:
Level of skills and availability for Technician

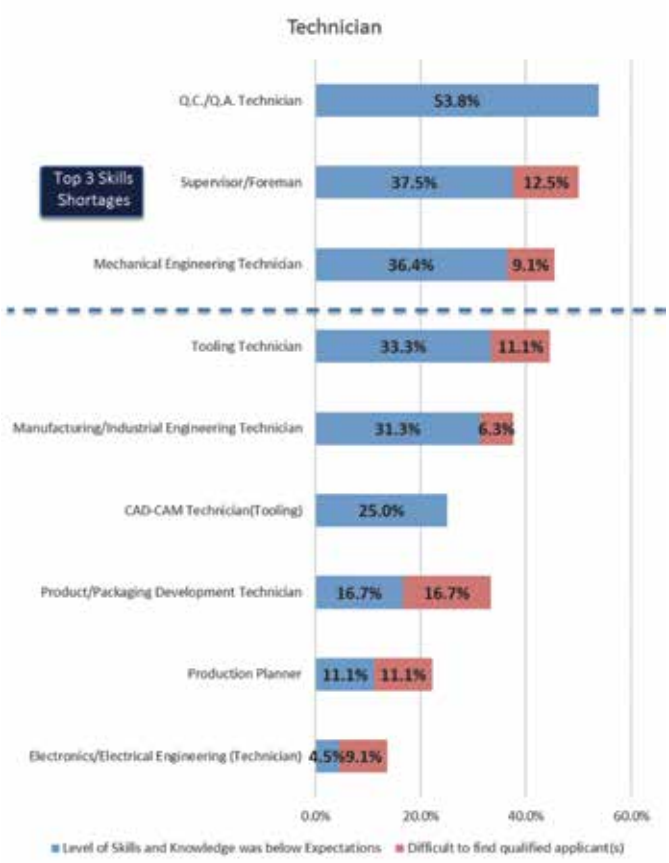


Figure 23.5:
Level of skills and availability for Craftsman

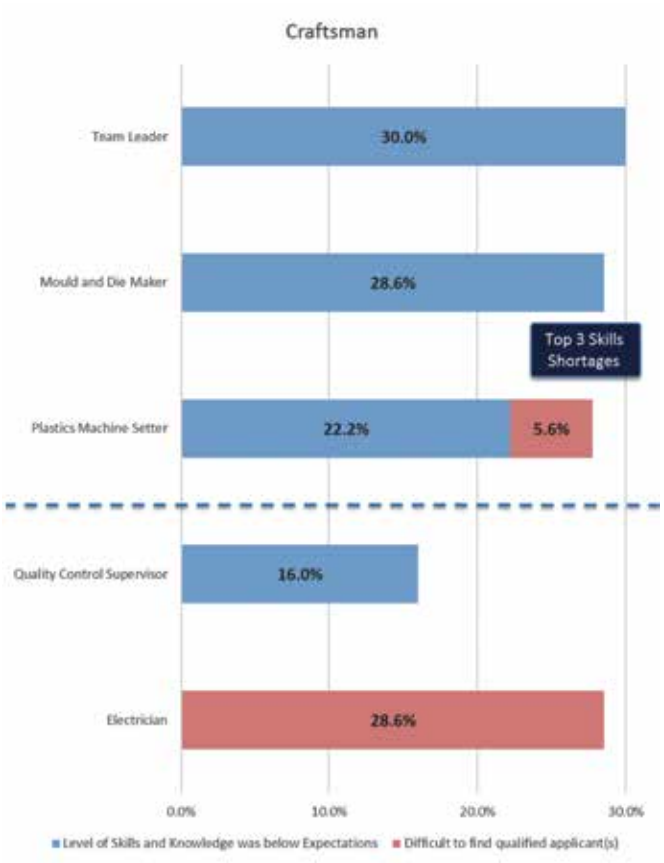
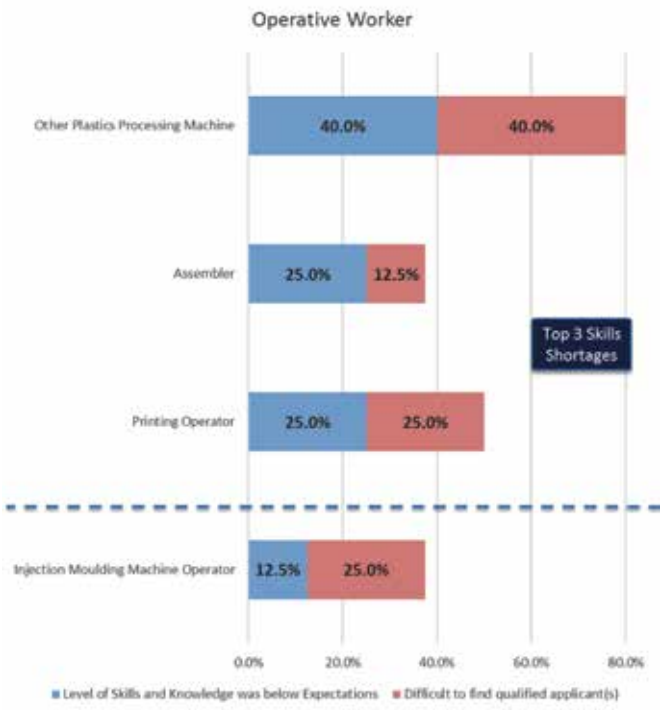


Figure 23.6:
Level of skills and availability for Operative Worker



The data suggests that there is a shortage of skilled workers at the entry level and technical roles with highly specific skill set requirements.

5.2.7 Stakeholder Involvement to Overcome Skills Needs for Firms

Q14. Please TICK which of the following assist your business to overcome your skills needs. If YES, please indicate the level of importance as a source of assistance/support.

Figure 24 shows the stakeholders that are regarded by the respondents as important contributors to skills training needs. 83.9% of the respondents rate *MPMA* as the top provider of skills training. This is followed by other *Industry Associations* (70.4%), *HRDF* (69.6%), *External Training Providers* (65.5%) and *Federal Ministries & Agencies* (49.1%). Interestingly, *Public Universities & Research Institutes* and *Private Universities & Research Institutes* score very poorly at 35.8% and 32.1%, respectively. This shows that universities and research institutes are not seen as the preferred place for acquiring skills training and development. This confirms the earlier assertion that the training provided especially by educational institutions is not meeting the needs of industry.

5.2.8 Expenditure on Staff Training in 2015

Q15. How much did you spend on staff training in 2015?

Figure 25.1 shows the average training cost in 2015 for employees in different job categories. The figure show that Finance has the highest average training cost at RM2,050.87; followed by *Technologists*, RM1,340.81; *Technicians*, RM954.78; *Craftsman*, RM595.78. *Operative Workers* and *General Workers* have the lowest average cost at RM183.33 and RM145.02, respectively. In summary, the figure shows that firms spend significantly lower for workers with basic skills compared to the spending on specialised and technical skills.

Figure 25.2 looks at the differences in average training cost per employee across size of firms. *Large* and *Medium Firms* tend to spend less on training per employee as compared to *Micro* and *Small Firms*. It also appears that average training cost is inversely proportional to size of firm. This might indicate that larger firms enjoy a volume discount on training while smaller firms are not able to access such discounts and hence have higher burden of cost per employee.

Figure 24:
Stakeholder assistance to overcome skills needs

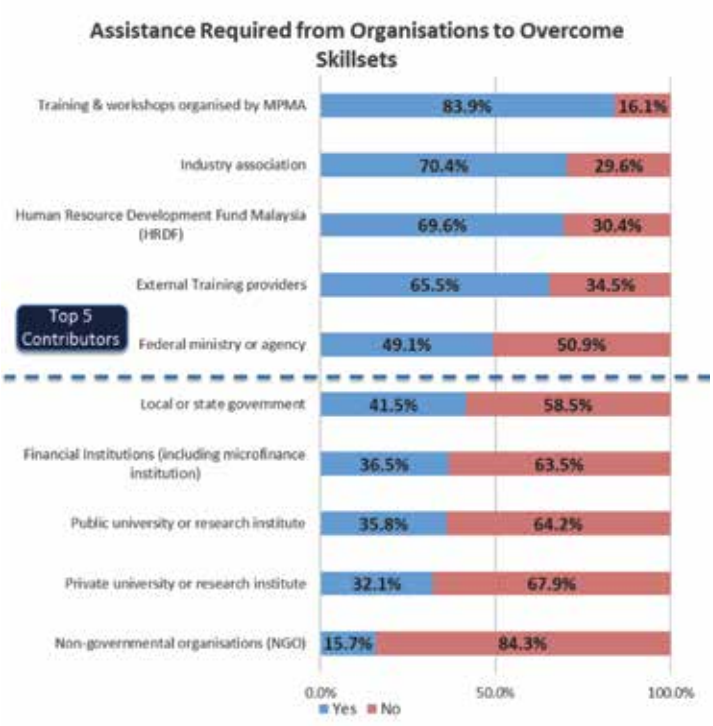


Figure 25.1:
Average training cost/employee (RM)

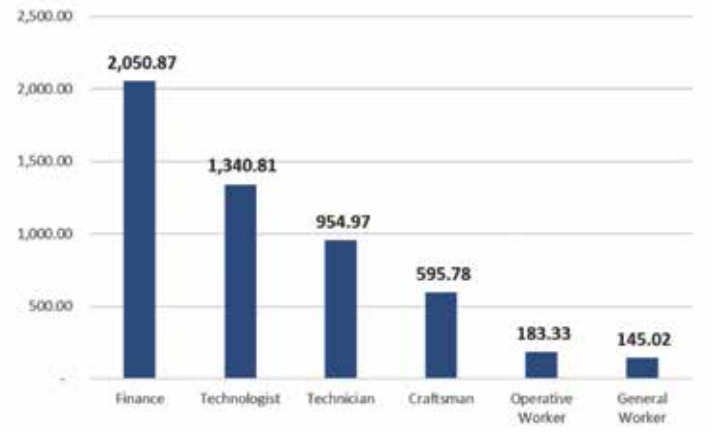
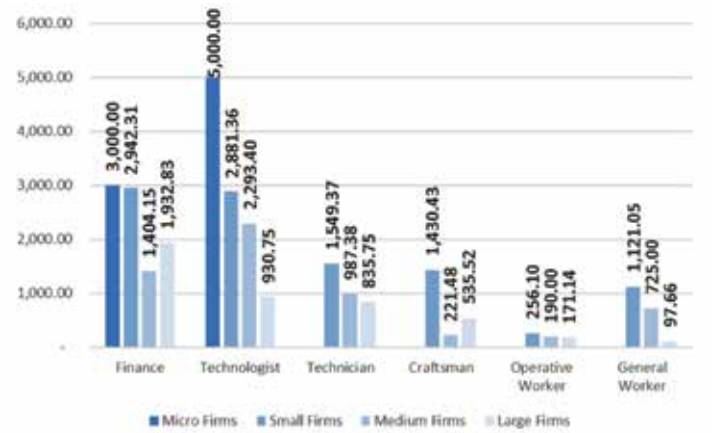


Figure 25.2:
Average training cost/employee by size of firm (RM)



5.2.9 Role and Source of Training

Q16. Please specify the importance of the following training in your business.

Figure 26.1 shows the trainings required by the industry, but are difficult to source in Malaysia. The top five skill sets that fall in this category are *Product Development* (15.8%); *Injection Moulding* (10.5%); *Quality Assurance* (10.3%); *Engineering Drawings* (8.8%) and *Mould Making* (7.1%).

Figure 26.2 examines the differences in access to training for the respective size of firms. For the top five trainings in shortage, it appears that *Small Firms* face the biggest struggle to obtain such training: *Product Development* (8.9%), *Injection Moulding* (6.7%), *Quality* (11.1%), *Engineering Drawings* (4.4%), and *Mould Making* (6.7%). This is followed by *Large Firms*: *Product Development* (6.7%), *Injection Moulding* (4.4%), and *Engineering Drawings* (2.2%). It appears that *Medium Firms* have the least difficulty to access these trainings with only around 4.4% for *Product Development* and 2.2% for the other top three skills.

Figure 26.2:
Skills required but difficult to source for appropriate training by size of firms (N = 45)

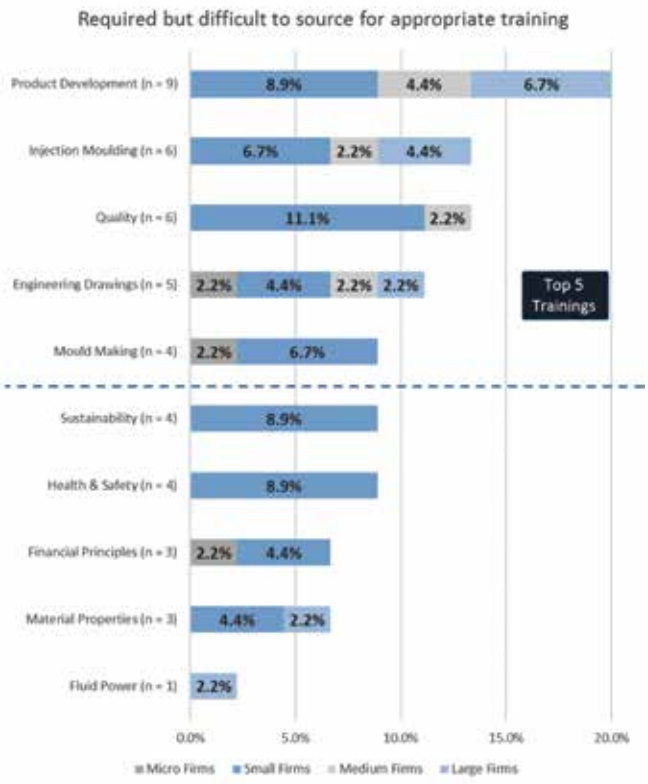


Figure 26.1:
Skills required but difficult to source for appropriate training

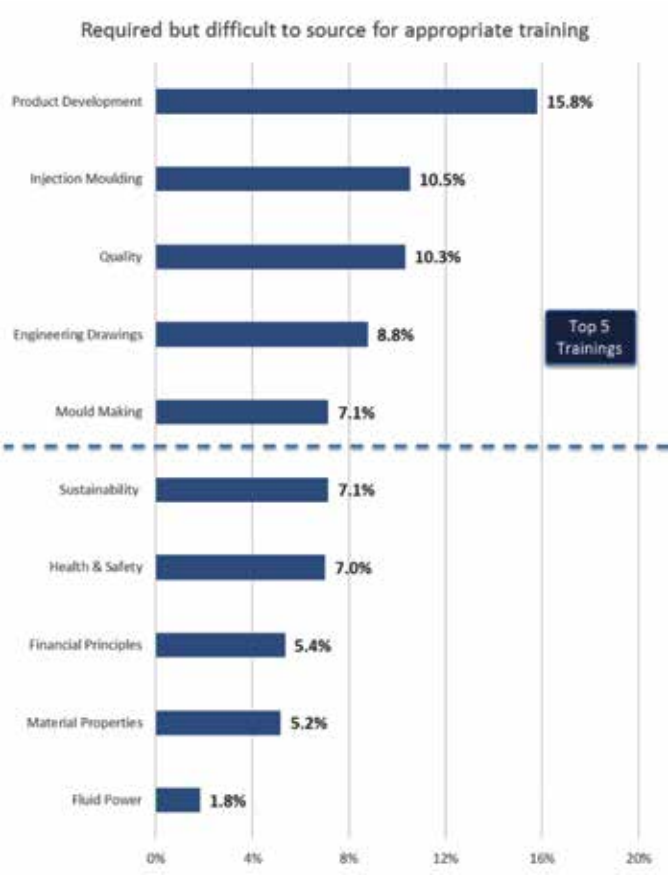


Figure 27.1:
Skills anticipated to be needed in 2 to 4 years

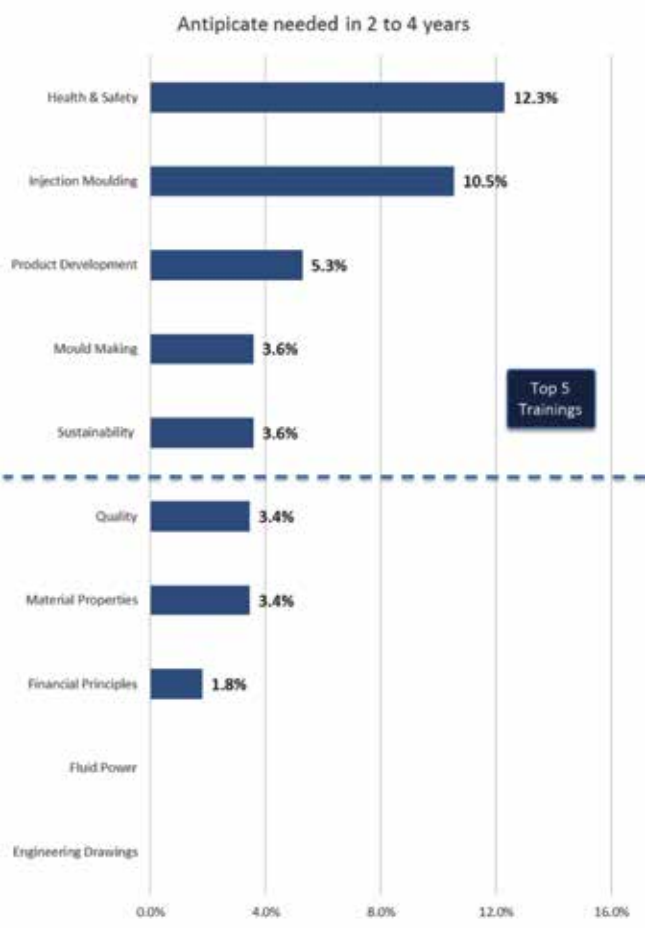


Figure 27.1 show the top skills set needed over the next two to four years. The top skills set needed in this category include: *Health & Safety* (12.3%); *Injection Moulding* (10.5%); *Product Development* (5.3%); *Mould Making* (3.6%) and *Sustainability* (3.6%).

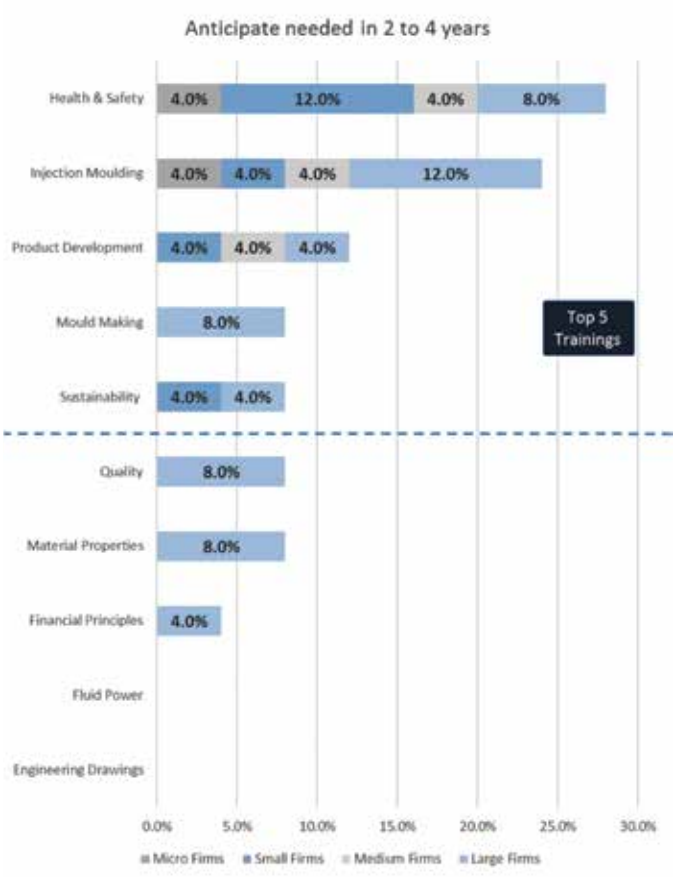
Figure 27.2 looks at the differences in future skills demand according to the size of firms. *Small Firms* were anticipating the need for *Health & Safety* the most with 12.0% of firms responding to it being *Small*. This is followed by *Injection Moulding* (4.0%), *Product Development* (4.0%), and *Sustainability* (4.0%). *Large Firms* on the other hand expect the need for *Injection Moulding* (12.0%) to rise in the near future. This is followed by *Health & Safety* (8.0%), *Mould Making* (8.0%), *Product Development* (4.0%), and *Sustainability* (4.0%).

5.2.10 Awareness in Technology and Skills Improvement

Q17. Have you identified any area(s) where workers need development or new skills for your firm's future competitiveness?

Among 38% of the respondents who are aware of technology and skill improvement, most reported that manufacturing process upgrade would earn them a competitive edge in the future.

FIGURE 27.2:
SKILLS ANTICIPATED TO BE NEEDED IN TWO TO FOUR YEARS BY SIZE OF FIRMS (N = 25)



6.0 PRELIMINARY RECOMMENDATIONS

The global industrial structure is undergoing unprecedented changes powered by rapid technological innovations and trade liberalisation policies. Both these global forces have intensified competition for local players in the plastics industry. To ensure that the local industry enhances its global competitiveness, local firms must move up the innovation value chain at a much faster pace that other global and regional players.

A key factor that is critical for raising the innovative capacity of the local plastics industry is the ability to develop the next generation talent that will power them with discoveries and enhance operational efficiency and new product development.

Increasing the supply of local talent in the industry does not guarantee that the industry will be able to gain global competitiveness unless the quality of talent attains global standards and aligns with industry needs. Additionally, the industry must take necessary measures to retain the best talent in the domestic economy. To do this the plastics industry ecosystem must be able to reverse the brain-drain that plagues the industry and ensure that it attracts the best talent, not just Malaysians, but also global talent. By doing so, Malaysia will become viable as an industry nexus and test-bed for spawning new innovations and discoveries.

To create a vibrant plastics industry ecosystem, key challenges and limitations in developing and retaining talent must be first identified and then measures taken to close the gaps through promulgation and implementation of policies and strategies. This study identifies four broad overarching issues that plague the Malaysian plastics injection moulding industry, which hinder innovation and global competitiveness. These challenges are discussed below.

Inadequate supply in the labour market

Endowed with a relatively small workforce compared to regional economies, the Malaysian industry has often opted to use foreign workers from countries where labour is more abundant. In December 2016, the Department of Statistics Malaysia (DOSM) reported an unemployment rate of 3.5%. With 14.3 million Malaysians (DOSM) and 2.1 million documented foreign workers (World Bank) employed in the country,

The 'foreign stop-gap' measure relieves the pressure on firms to move towards a more capital intensive strategy through deployment of advanced technologies and automation of labour intensive tasks. The transition requires putting in place capability development programmes to raise the skillset of workers to operate in high-technology intensive industry.

Recommendations in brief:

- Develop specific strategies and execute plans to help the industry make a smooth transition to automated operations.

Struggle to attract and retain talent

The Malaysian PIM industry has been struggling to fulfil staffing requirements of skilled workers, able to undertake higher value-add activities (for example, advanced manufacturing skills and new materials and operational knowledge of new standards of practice) due to the low availability of suitably trained and qualified people in the domestic talent pool. In a situation where supply does not meet the demands of the industry, highly sought after talented individuals tend to gravitate towards higher paying foreign multinational corporations (MNCs) in Malaysia or leave the country for more attractive opportunities abroad. The situation is compounded by the difficulty in engaging foreign experts to develop the domestic industry, since most talented foreign experts can easily command better remuneration packages at MNCs or have access to top research laboratories and institutes. Of even greater concern, talented local individuals who initially opted to stay, eventually start to leave local companies for better working environment overseas to develop themselves and their careers.

Recommendation in brief:

- Provide skills to local people in low growth areas to improve the local economy
- Skills training and mentoring

Mismatch between skill sets of graduates and skills required by industry

Linkages between industry, universities and research centres are weak and at best patchy. Consequently, the skill sets of new graduates from local universities do not meet the needs of the PIM industry which is undergoing rapid pace transformation. Changes in the environment coupled with converging technology platforms are taking place at a much faster pace than universities and institutions of higher learning are able to adjust their curriculum. This forces many firms to incur significant expenditure to retrain graduates from Malaysian universities and institutions of learning.

Weak 'triple-helix' in the industry also means much of the R&D undertaken by universities and public research institutes fails to align with industry needs. Even though some local educational institutions are producing a sizeable quantity of workforce who are able to use existing technology, there is a significant vacuum in creative and innovative graduates who are able to take the plastics injection moulding industry to its next stage of development.

Recommendations in brief:

- Improve quality of trainers
- Support from government for imparting training, especially to those with basic skills
- Ensure the use of technology for teaching and learning
- Develop short-term customised training programmes
- Improve competencies of universities and institutions, especially in advanced skills and research capabilities and create knowledge transfer mechanism to industry.

Lack of affordable continuous training and capability development programme

There is strong recognition that continuous training and development programmes are critical to ensure that the workforce keeps pace with developments taking place in the global plastics industry. One of the challenges faced by the industry is the lack of affordable training programmes due to the lack of experts and mentors in Malaysia. Most of the leading experts (including Malaysian talent) reside in foreign countries, such as Singapore, Taiwan, US, UK and Australia. This makes conducting workshops and training programmes using foreign experts expensive and beyond the reach of many local firms, especially the SMEs.

Additionally, even though some of the Malaysian universities and research institutes are endowed with excellent research infrastructure, the lack of talent and technical experts means many of these institutions are unable to undertake continuous trainings that is relevant for the industry.

Recommendations in brief:

Strengthening of skills development through centres:

- 'One stop shop' or centre of excellence for skills development.
- Develop a longer term plan with priority areas taken into consideration.
- Comprehensive information portal on available skills development and training providers.
- The centres should explore the full range of skill development related to the sector.

The above challenges highlights that while Malaysia has key ingredients to become a global player in the plastics industry, limitations in the stock of creative talent in the industry hinder its move up the value chain and global competitiveness.

Appendix 1

NATURE OF BUSINESS AND THE STRUCTURE OF EXISTING WORKFORCE

1. Please indicate total number of employees in your business. (Please circle only ONE)

a. 1 - 4	b.5 - 19	c. 20 - 75	d. 76 - 200	e. 201 - 499	f. 500+

2. Please select your product manufactured category (You may tick more than one).

a.	Packaging (containers, bottles)	❑	k.	OEM Manufacturing	❑
b.	Electrical and Electronic Products, Parts and Accessories	❑	l.	Toiletries/Personal Items	❑
c.	Transportation Products, Parts and Accessories	❑	m.	Cutlery	❑
d.	Houseware, Kitchenware and Tableware	❑	n.	Toys and Sports Items	❑
e.	Industrial and Construction Products	❑	o.	Stationary Products	❑
f.	Telecommunication Products, Parts and Accessories	❑	p.	Recreational Items	❑
g.	Furniture and Parts	❑	q.	Gardening Products	❑
h.	Medical/Pharmaceutical Products	❑	r.	Pet/Animal Products	❑
i.	Promotion Items/Gifts	❑	s.	Others (please specify):	❑
j.	Optical Products	❑		_____	

3. What is the structure of your current workforce? Please indicate the number of employees in the following categories.

		Full-time		Part-time		Foreign worker	
		Male	Female	Male	Female	Male	Female
3.1	Finance[a]						
3.2	Technologist[b]						
3.3	Technician[c]						
3.4	Craftsman[d]						
3.5	Operative Worker[e]						
3.6	General Worker (Unskilled)[f]						

a ***Finance:*** *Casting Personnel*

b ***Technologist:*** *Product Engineer, Manufacturing/Industrial Engineer, CAD-CAM Engineer/Tooling Engineer, Project Engineer, Q.C.IQ.A. Engineer, Electronics/Electrical Engineer, Technical Services Engineer, Moulding Engineer, Production Operations Manager*

c ***Technician:*** *Supervisor/Foreman, Mechanical Engineering Technician, Electronics/Electrical Engineering Technician, Q.C./Q.A. Technician, Product/Packaging Development Technician, Laboratory/Materials Technician, Manufacturing/Industrial Engineering Technician, Tooling Technician, CAD-CAM Technician (Tooling), Production Planner*

d ***Craftsman:*** *Team Leader, Electrician, Mould and Die Maker, Model/Prototype Maker, Plastics Machine Operator, Quality Control Inspector*

e ***Operative Worker:*** *Injection Moulding Machine Operator, Other Plastics Processing Machine Operator, Printing Operator, Assembler, Plastics Fabricator/Welder*

f ***General Worker:*** *Factory Worker(involved in manual work such as loading and unloading goods, sprue removal, packing etc.)*

4. What is the age profile of your current workforce (in percentage)?

		18 - 25	26 - 35	36 - 45	46 - 55	55+
4.1	Finance					
4.2	Technologist					
4.3	Technician					
4.4	Craftsman					
4.5	Operative Worker					
4.6	General Worker (Unskilled)					

5. Please indicate typical education level for each position.

		Lower Secondary	Upper Secondary	Pre-university level	Skills/ Vocational Certificate	Diploma	Under-graduate degree	Master degree and above
5.1	Finance	1	2	3	4	5	6	7
5.2	Technologist	1	2	3	4	5	6	7
5.3	Technician	1	2	3	4	5	6	7
5.4	Craftsman	1	2	3	4	5	6	7
5.5	Operative Worker	1	2	3	4	5	6	7
5.6	General Worker (Unskilled)	1	2	3	4	5	6	7

6. What is the average rate of worker turnover in 2015?

		Less than 5%	5 - 10%	11 - 20%	21 - 30%	Greater than 30%
6.1	Finance	1	2	3	4	5
6.2	Technologist	1	2	3	4	5
6.3	Technician	1	2	3	4	5
6.4	Craftsman	1	2	3	4	5
6.5	Operative Worker	1	2	3	4	5
6.6	General Worker (Unskilled)	1	2	3	4	5

7. Please indicate average salary per month for each position.

		Under RM2000	RM2001 - 3000	RM3001 - 4000	RM4001 - 6000	RM6001 - 8000	RM8001 +
7.1	Finance	1	2	3	4	5	6
7.2	Technologist	1	2	3	4	5	6
7.3	Technician	1	2	3	4	5	6
7.4	Craftsman	1	2	3	4	5	6
7.5	Operative Worker	1	2	3	4	5	6
7.6	General Worker (Unskilled)	1	2	3	4	5	6

YOUR CURRENT AND FUTURE SKILLS NEEDS

	Very low importance	Low importance	Moderate importance	High imporatnce	Very high importance
8. How important is skills enhancement to your business competitiveness?	1	2	3	4	5

	Very easy	Easy	Neutral	Difficult	Very difficult
9. How difficult is it to recruit skilled employees in your business?	1	2	3	4	5

10. Please specify the importance of the following skills for manufacturing and technical positions in your business.

		Not required	Required but do not adequately possess	Required and adequately possess	Would be nice to possess	Anticipate need in 2 to 4 years
10.1	Chemical Engineering Technology	1	2	3	4	5
10.2	Production Engineering Technology	1	2	3	4	5
10.3	Manufacturing Engineering Technology	1	2	3	4	5
10.4	Process Control/Automation	1	2	3	4	5
10.5	Electrical/Mechanical Technology	1	2	3	4	5
10.6	Maintenance	1	2	3	4	5
10.7	Others (please specify): _____	1	2	3	4	5

11. What percentage of learning occurs on the job? In other words, other than formal qualifications and certificates, how much learning do your employees undertake during the course of their jobs?

		Less than 10%	10 - 25%	26 - 50%	51 - 75%	Greater than 75%
11.1	Finance	1	2	3	4	5
11.2	Technologist	1	2	3	4	5
11.3	Technician	1	2	3	4	5
11.4	Craftsman	1	2	3	4	5
11.5	Operative Worker	1	2	3	4	5
11.6	General Worker (Unskilled)	1	2	3	4	5

12. What action is your business likely to take to overcome problems obtaining skilled employees?

		Very unlikely	Unlikely	Neutral	Likely	Very Likely
12.1	No action	1	2	3	4	5
12.2	Outsource the job/work	1	2	3	4	5
12.3	Invest in plant/equipment	1	2	3	4	5
12.4	Recruit from training providers	1	2	3	4	5
12.5	Internal training/mentoring	1	2	3	4	5
12.6	Training by external providers	1	2	3	4	5
12.7	Others (please specify): _____	1	2	3	4	5

13. Have you hired or attempted to hire for the following positions in the last six months? If YES, please specify the number of people you are seeking and indicate the difficulty in attracting qualified candidates for each of the position.

		No	Yes	Number sought	Level of skills and knowledge exceed expectations	Level of skills and knowledge met expectations	Level of skills and knowledge was below expectations	Difficult to find qualified applicant(s)
13.1	Finance	❑	❑→		1	2	3	4
Technologist								
13.2	Product Engineer (Plastics)	❑	❑→		1	2	3	4
13.3	Manufacturing/Industrial Engineer	❑	❑→		1	2	3	4
13.4	CAD-CAM Engineer/Tooling Engineer	❑	❑→		1	2	3	4
13.5	Project Engineer	❑	❑→		1	2	3	4
13.6	Q.C./Q.A. Engineer	❑	❑→		1	2	3	4
13.7	Electronics/Electrical Engineer	❑	❑→		1	2	3	4
13.8	Technical Services Engineer	❑	❑→		1	2	3	4
13.9	Moulding Engineer	❑	❑→		1	2	3	4
13.10	Production Operations Manager	❑	❑→		1	2	3	4
Technician								
13.11	Supervisor/Foreman	❑	❑→		1	2	3	4
13.12	Mechanical Engineering Technician	❑	❑→		1	2	3	4
13.13	Electronics/Electrical Engineering Technician	❑	❑→		1	2	3	4
13.14	Q.C./Q.A. Technician	❑	❑→		1	2	3	4
13.15	Product/Packaging Development Technician	❑	❑→		1	2	3	4
13.16	Laboratory/Materials Technician	❑	❑→		1	2	3	4
13.17	Manufacturing/Industrial Engineering Technician	❑	❑→		1	2	3	4
13.18	Tooling Technician	❑	❑→		1	2	3	4
13.19	CAD-CAM Technician (Tooling)	❑	❑→		1	2	3	4
13.20	Production Planner	❑	❑→		1	2	3	4
Craftsman								
13.21	Team Leader	❑	❑→		1	2	3	4
13.22	Electrician	❑	❑→		1	2	3	4
13.23	Mould and Die Maker	❑	❑→		1	2	3	4
13.24	Model/Prototype Maker	❑	❑→		1	2	3	4
13.25	Plastics Machine Setter	❑	❑→		1	2	3	4
13.26	Quality Control Inspector	❑	❑→		1	2	3	4

		No	Yes	Number sought	Level of skills and knowledge exceed expectations	Level of skills and knowledge met expectations	Level of skills and knowledge was below expectations	Difficult to find qualified applicant(s)
Operative Worker								
13.27	Injection Moulding Machine Operator	❑	❑→		1	2	3	4
13.28	Other Plastics Processing Machine Operator	❑	❑→		1	2	3	4
13.29	Printing Operator	❑	❑→		1	2	3	4
13.30	Assembler	❑	❑→		1	2	3	4
13.31	Plastics Fabricator/Welder	❑	❑→		1	2	3	4
13.32	General Worker (Unskilled)	❑	❑→		1	2	3	4

14. Please TICK which of the following assist your business to overcome your skills needs. If YES, please indicate the level of importance as a source of assistance/support.

		No	Yes	Very Low Importance	Low Importance	Neutral	High Importance	Very High Importance
14.1	Federal ministry or agency	❑	❑→	1	2	3	4	5
14.2	Local or State Government	❑	❑→	1	2	3	4	5
14.3	Public university or research institute	❑	❑→	1	2	3	4	5
14.4	Private university or research institute	❑	❑→	1	2	3	4	5
14.5	Non-governmental organisations (NGO)	❑	❑→	1	2	3	4	5
14.6	Industry association	❑	❑→	1	2	3	4	5
14.7	Financial Institutions (including microfinance institutions)	❑	❑→	1	2	3	4	5
14.8	External Training providers	❑	❑→	1	2	3	4	5
14.9	Human Resource Development Fund Malaysia (HRDF)	❑	❑→	1	2	3	4	5
14.10	Training and workshop organised by MPMA	❑	❑→	1	2	3	4	5

15. How much did you spend on staff training in 2015?

		RM	Number of employees trained
15.1	Finance		
15.2	Technologist		
15.3	Technician		
15.4	Craftsman		
15.5	Operative Worker		
15.6	General Worker (Unskilled)		

16. Please specify the importance of the following training in your business.

		Not required	Required but cannot get training	Required and can get adequate training	Would be niceto have such training	Anticipate need in 2 to 4 years
16.1	Training related to Health & Safety	1	2	3	4	5
16.2	Training related to Engineering Drawings	1	2	3	4	5
16.3	Training related to Material Properties	1	2	3	4	5
16.4	Training related to Fluid Power	1	2	3	4	5
16.5	Training related to Quality	1	2	3	4	5
16.6	Training related to Sustainability	1	2	3	4	5
16.7	Training related to Injection Moulding	1	2	3	4	5
16.8	Training related to Product Development	1	2	3	4	5
16.9	Training related to Mould Making	1	2	3	4	5
16.10	Training related to Financial Principles	1	2	3	4	5
16.11	Others (please specify): _____	1	2	3	4	5

17. Have you identified any area(s) where workers need development or new skills for your firm's future competitiveness?

a. No	b. Yes. Please specify the area(s):

Your name :

Position :

Company Name :

MPMA membership Number MPMA :

Company Address :

THANK YOU FOR YOUR COOPERATION AND SUPPORT.
INDIVIDUAL COMPANY DATA WILL NOT BE PUBLISHED AND REMAINS CONFIDENTIAL.

MALAYSIAN PLASTICS MANUFACTURERS ASSOCIATION

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