



Manpower Update Report

Manufacturing Technology Industry

2021

Manufacturing Technology
Training Board

ACKNOWLEDGEMENT

The Manufacturing Technology Training Board would like to express its gratitude to the members of the focus group for their valuable time and insights on the manpower situation of the manufacturing technology industry. Special thanks go to CPJobs and CTgoodjobs who shared the database of job vacancies. The views of focus group and Training Board members and information from major recruitment websites formed an integral part of this report.

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Introduction

Background

Appointed by the Government of the HKSAR, the Manufacturing Technology Training Board (MTTB) of the Vocational Training Council (VTC) is responsible for determining manpower demand of the industry, assessing whether the manpower supply matches manpower demand, and recommending the development of vocational and

professional education and training (VPET) to meet the assessed training needs.

A new approach for collecting manpower information is adopted to enhance the effectiveness and better reflect the dynamics of the manpower situation. Under the new approach, one manpower

survey is conducted every four years, and is supplemented by two manpower updates. Since 2018, the MTTB collected manpower information from relevant companies and completed its quantitative manpower survey, to be followed by two manpower updates.

This manpower update report comprises:

- (a) **a focus group meeting** with views from industry experts on the latest industrial developments, manpower demand, recruitment difficulties, training needs, and measures to tackle the challenges the industry faces; and
- (b) **desk research and analysis** of recruitment information related to the manufacturing technology industry from major recruitment portals.

Objectives

The objectives of the manpower update report are:

- (i) to examine **the latest trends and developments** of the manufacturing technology industry;
- (ii) to explore **the job market situation and recruitment challenges**;
- (iii) to identify **the training needs**; and
- (iv) to recommend **measures to meet the training needs** and to ease the problem of manpower shortage.

Methodology

Overview

This update report aims to provide the latest development of the manufacturing technology industry through views collected from a focus group meeting, supplemented by desk research on job advertisements from major recruitment portals.

Focus Group Meeting

The focus group members are representatives from manufacturing, trading and services, and material supply sectors of the metals and plastics industries, covering electrical and electronic products, toys, aero parts, medical devices, and green lifestyle products. The focus group meeting was conducted on 30 October 2020. An experienced moderator led members to an in-depth discussion on topics selected by the Working Party on Manpower Survey of the MTTB. The discussion at the meeting was recorded and transcribed to facilitate analysis.

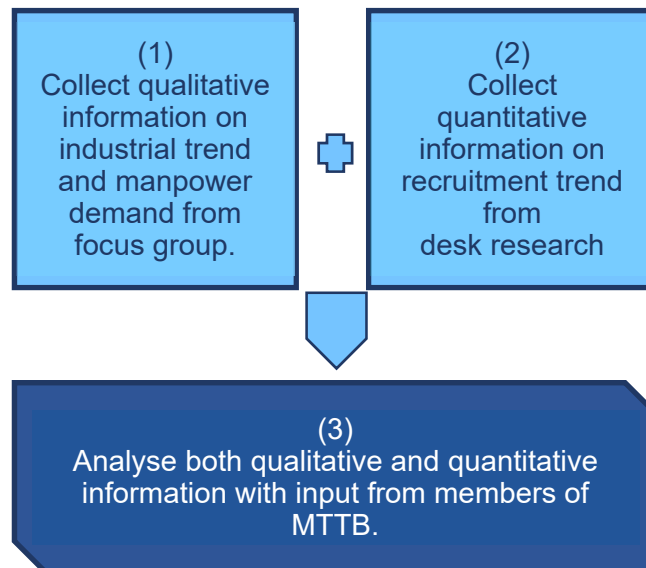
Desk Research

Manpower information covering the period between Quarter 3 of 2019 and Quarter 2 of 2020 was collected through desk research. An information system was

developed to capture relevant recruitment data from major online recruitment portals. Collected information was mapped against the list of companies related to the manufacturing technology industry under the Hong Kong Standard Industrial Classification devised by the Census and Statistics Department. After mapping and removal of duplicated records, a total of 3,392 recruitment records were collected during the research period and served as indicative information of the job market trend.

Data Analysis

The analysis consists of three steps:



Limitations

As this is not a full manpower survey, the findings and recommendations of the focus group meeting are more qualitative in nature and the report focuses mainly on the manpower trends. The information of job advertisements was collected from major recruitment portals, such as

CPjobs, CTgoodjobs and the Labour Department. Other channels, such as recruitment through HR vendors and referrals, were not covered. Since the data collected is a snapshot of a particular period without reference to any historical data, this can only be served as supplementary information to the findings of the focus group meeting.

Findings

Factors Affecting Development of the Industry

From Mass Manufacturing to an Innovation-centric Business Model

Original equipment manufacturing (OEM) was the predominant business model of the manufacturing technology industry in Hong Kong, making it a success for years. With the change in the industrial trend and market demand, an increasing number of manufacturers have automated or outsourced their manufacturing processes and shifted their focus to manufacturing services, such as product design and innovation, product development and branding. The traditional OEM model has gradually evolved into original design manufacturing (ODM) and original brand manufacturing (OBM) in recent

years. **In response to the paradigm shift, some manufacturers maintain their research and development (R&D) arm and product design and development section in Hong Kong for a higher degree of intellectual property rights protection. All these prompt a manpower reduction at different levels of operation and yet an emergence of new skills and abilities to be sought in the manpower pool.**

In addition to the change of business model, consumers' expectation on product and quality have also enhanced. The economic shock generated by the COVID-19 pandemic has reflected an emerging "buy less, buy better" consumption trend.

Smart design, considering user experience and user-friendliness, has become an important direction for the manufacturing technology industry in Hong Kong which needs to be considered by manufacturers during the product design, development and manufacturing processes. **This requires seamless cooperation among product designers, manufacturing team and marketing team in a manufacturing company to deliver a design that responds to consumers' demand for price and quality.**

The Pursuit of Industry 4.0

Rapid technological advancement has transformed the way business is run and the manpower landscape of the manufacturing technology industry. Advancement in Internet technologies and proliferation of e-commerce have fostered end-to-end manufacturing. Manufacturing nowadays is not only about automation with robotics but digitalisation of processes to ensure timely response in production to rapid changes in market demand. Regardless of the company size or the sub-sector they are in, manufacturers need to keep up with the technologies to maintain the effectiveness of their manufacturing processes and competitiveness. While the application of Industry 4.0, such as Internet of Things (IoT), cloud technology, real-time database, big data analytics, artificial intelligence

(AI), robotics, 3D printing and 5G, is not prevalent in the manufacturing technology industry, **the need to equip manpower with knowledge and skills to help the industry migrate to Industry 4.0 is a must to go.**

Green Manufacturing on the Rise

With the manufacturing technology industry being a major contributor to pollution, sustainability and eco-consciousness have drawn a lot of social attention around the world in recent years. Green manufacturing is hence one of the emerging trends in the industry. Many overseas factories are required to abide by strict regulations on industrial wastewater treatment and electrical usage imposed by the government. Materials used during manufacturing processes are also areas of public concern. **Some members considered the demand for environmentally friendly materials (e.g. degradable and recycled materials) is likely to grow in the coming years; thus manufacturers better pay close attention to the regulations on green manufacturing.**

Mainland Market as Remedy

Conflicts between the world's largest economies have no doubt created a significant impact on the

manufacturing technology industry. The US revocation of Hong Kong's special status has further impaired the entire supply chain, including the manufacturing base in Hong Kong. As a result, orders from the US market for some Hong Kong manufacturers have shrunk significantly. Slowdowns in major economies triggered by the pandemic also highlight the appeal of the huge domestic consumption in Mainland market at least as a remedy for survival. Indeed, some members reflected that while the Mainland market remains highly competitive, demand for quality exists as affordability of consumers increases. They anticipated that **the Mainland market will be a short-term strategy to mitigate the damage brought by the Sino-US trade war and the pandemic-triggered economic slowdown; yet enhancing one's capability in high-value added manufacturing would be the long way to go.**

The Potentials in Guangdong-Hong Kong-Macao Greater Bay Area

The Guangdong-Hong Kong-Macao Greater Bay Area (GBA) is one of the key development plans implemented by the Central Government. Close collaboration has been established between local governments and regulators as the GBA continues to develop. This has encouraged and

attracted capital and talents to look for opportunities in the GBA. At the same time, the operating costs in Hong Kong especially rental are so high that even enterprises with high sales margins find it difficult to sustain their business. Hence, **manufacturers in Hong Kong can take advantage of the sufficient resources in the GBA to expand their manufacturing operation there, while talents from Hong Kong, especially young employees with basic technical know-how, multi-disciplinary abilities, language competence and adaptability to changes, are on high demand in the GBA.**

Pressing Reindustrialisation

The HKSAR Government, industrialists and education institutions have been playing an important role in pressing reindustrialisation in Hong Kong. While the rental costs in Hong Kong has caused hesitation to some manufacturers for moving back, **opportunities are seen in (i) prioritizing critical and R&D-driven manufacturing processes in Hong Kong to ensure quality and IP protection, (ii) upgrading the quality and productivity of some traditional manufacturing products to sharpen competitive edge, and (iii) developing and applying new technologies to enhance and**

automate the manufacturing process of manufacturing plants outside Hong Kong.

^ With the new initiative “dual circulation strategy” being orchestrated in China, MTTB members not only supported the view of finding business opportunities in the Mainland market during the pandemic as a remedy, but also promoted the search of potentials in the Mainland market for long-term development (Views from MTTB members collected in the Working Party of Manpower Survey in January 2021).

Manpower Demand

Manufacturing Services is the Core with a Call for Multi-disciplinary Skill Set

When businesses shift from OEM to ODM and OBM, the industry indeed requires talents who can demonstrate proficiency in technical know-how and experience in a wide range of aspects within the entire product life cycle and across the supply chain. **Positions in project management being familiar with product design and development and supply chain management are therefore in high demand.** Having said that, talents should better possess practical experience in 1-2 technical fields.

To enhance the competitiveness of the manufacturing technology industry in Hong Kong and establish a differentiating position from neighbouring regions, some members saw the need to further develop value-added services, such as sales engineering and service engineering. Such services involve a broad

spectrum of consulting and engineering knowledge to support enterprises with problems arising during the manufacturing process.

Technical talents need to equip with extensive knowledge of various machineries and manufacturing processes as well as advanced technology.

In both career pathways focusing on project management or technical development, **talents also need to equip with soft skills such as technical English, presentation skills and perseverance to deal with adversity in order to excel in these positions.**

Innovative Power in R&D

Some members have also observed that R&D and innovation is lacking in Hong Kong. Manufacturers are often contracted to produce products for other markets instead of manufacturing products using their original ideas. To make the

manufacturing technology industry revive, R&D and innovation need to be highly encouraged and supported by the HKSAR Government. **Higher academic qualifications are expected for staff assigned to R&D and innovation projects and they need to prove that they have obtained a certain level of industrial knowledge and skills to actualise the project.**

Compliance Knowledge and Support in Testing & Certification

Some products, especially medical and aviation-related devices, require a high standard of quality. Manufacturers need to fulfil rigorous compliance requirements and procedures. Some members expressed the lack of local support for testing and certification on compliance. Currently, Hong Kong has limited service providers in such area, which in turn leads to high costs for testing and certification. **The industry needs to have more talents who are knowledgeable of regulations in different markets to meet the demand.** A member

reckoned that **only a fair academic level is required of a compliance staff as on-the-job training will be provided. This will lower the recruitment threshold and make recruitment easier.**

Hot Jobs and Skills on Demand Revealed in Desk Research

Among the 3,392 job advertisements collected between July 2019 and June 2020 through desk research on major recruitment portals, Product Engineer ranked the top at 12.2%, followed by Merchandiser, Product/Graphic Design and Technical Sales as shown in Table 1. Product Engineer was not one of the principal jobs with most employees as shown in the 2018 manpower survey, yet it appeared to be on high demand in 2019-2020. On the other hand, Merchandiser was the top principal job with the highest number of employees, and it was thus one of the top jobs on demand. **These jobs demand technical know-how, multi-disciplinary skill sets and cross-team collaboration.**

Table 1 Hot Jobs on Demand (July 2019 to June 2020)

Top 5 Jobs		% of Occurrence in Major Recruitment Portals
1. Product Engineer	12.2% (415)	44% of 3,392 job advertisements
2. Merchandiser	8.8% (300)	
3. Product/Graphic Designer	8.6% (291)	
4. Technical Sales	8.4% (284)	
5. Mechanical Engineer	6.0% (202)	

Regarding the top skills as shown in Table 2, language skills, particularly English, is inevitably on top of the list.

Sharpening one’s English proficiency will definitely enhance the competitive edge of local employees when compared to those in the region or Southeast Asia.

Although most manufacturing is not

conducted locally in Hong Kong, technical skills cannot be diminished. Echoed with the views collected in the focus group meeting, **skills in product design and development were highly expected in employees, followed by knowledge in testing and certification, project management, and research and development.**

Table 2 Hot Skills on Demand (July 2019 to June 2020)

Top 5 Skills	
1.	English
2.	Product Design & Development
3.	Testing & Certification
4.	Project Management
5.	Research & Development

^ While China has been the top 5 largest economies in the world, MTTB members also value employees with fluency in Mandarin, in addition to their English proficiency. They also advised that the top skills can be trained up effectively in authentic workplace settings if the industry is willing to provide full support in offering industrial attachment, workplace training and collaborative projects to training institutes (Views from MTTB members collected in the Working Party of Manpower Survey in January 2021).

Recruitment Challenges

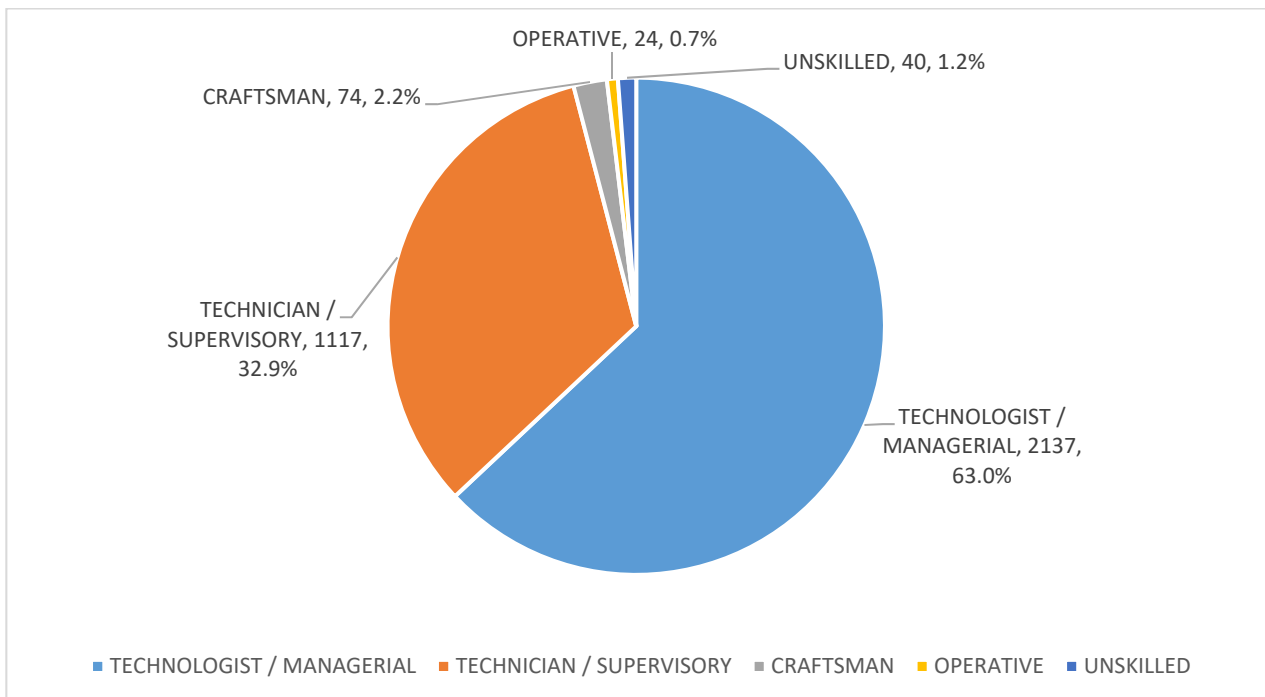
Traditional “Blue Collar” Image hindering Young Entrants

Some members observed that young people have low interest in joining and staying in the manufacturing technology industry. **The traditional “blue collar” image of a manufacturing career has discouraged them from applying for a job.** Not only does this image linger among young people, but also their parents who often envisage their children to pursue a career with higher social status and prestige instead of a labour-intensive work in the manufacturing field. The impact of the pandemic on a finance and retail focused economy may shield light on the repositioning of the

manufacturing technology industry in Hong Kong.

In fact, around 96% of the job advertisements looked for manpower at higher ranks, i.e. Technologist/Managerial posts (63.0%) and Technician/Supervisory posts (32.9%), as shown in Figure 1. These jobs mostly demand employees with higher education level ranging from diploma to degree. Such recruitment trend of employees with higher education level echoes with the findings conducted in the 2018 manpower survey. The industry is inevitably an innovation-centric and advanced-technology driven industry and the blue collar image is the past.

Figure 1 Number of Online Job Advertisements by Job Level (July 2019 to June 2020)



[^] The manufacturing technology industry, as advised by MTTB members, should showcase the advanced technology and machinery used in manufacturing plants locally or in the Mainland to promote the innovation-centric and technological image of the industry. MTTB members suggested employers posting job advertisements with a job title worthy of the name instead of a general job title so to reflect the rank, qualification and salary of the post (Views from MTTB members collected in the Working Party of Manpower Survey in January 2021).

Technical Talent Gaps

Aging manpower in the industry is not news and has deteriorated with a lack of new blood. The aging issue is particularly serious among skilled workers for high performance products. This does not only affect productivity, but **it also opens a succession gap while the current batch of senior workers retires.**

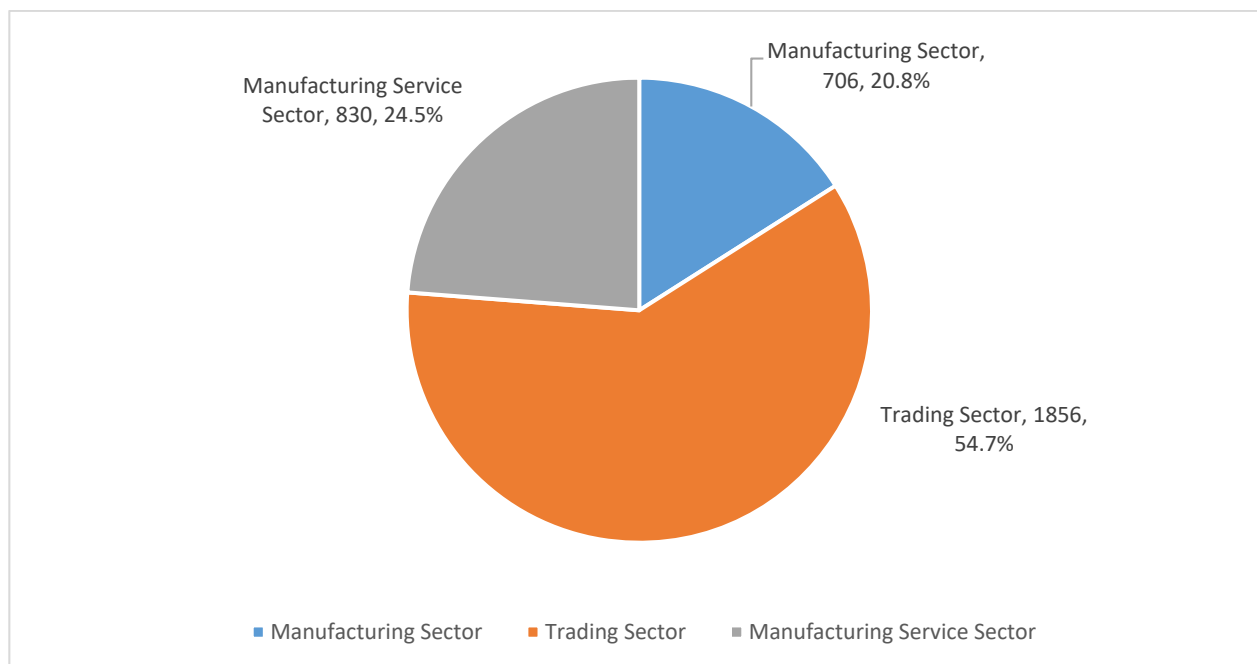
Horses for Courses

With Hong Kong being the hub for international business riding on high connectivity to the rest of the world, **young employees have easy access to information, technologies and ideologies in overseas markets. Such high accessibility to information and international perspectives helps nurture a pool of local graduates with strong business acumen and innovative power.** Young employees are also quick on the uptake and adapt well in a fast-paced working environment and

industry, though they are somewhat less proactive and confident to express views. **Together with the required English proficiency for handling international customers, these unique characteristics of young employees in Hong Kong will make them stand out.**

As shown in Figure 2, around 55% of the job advertisements occurred in the Trading Sector, in which the import and export of machinery and equipment ranked top at 27.6% and the import and export of toys ranked second at 25%, followed by the engineering services of the Manufacturing Service Sector at 19.8%. **Young employees with technical know-how, adequate English proficiency to communicate with customers worldwide, international perspectives the city provides will be able to perform in the manufacturing technology industry.**

Figure 2 Number of Online Job Advertisements by Sector (July 2019 to June 2020)



Less Motivated to Work in Mainland

It is typical that manufacturers in Hong Kong maintain operation lines in Mainland. Some members opined that Hong Kong graduates are rather reluctant to work across the border, which makes it even more difficult for them to recruit new Hong Kong staff. **This can be attributed to a lack of understanding of the work life and environment of Mainland as well as the advanced development of the industry.**

Training Needs

Knowledge of New Technologies and Industry 4.0

The trend of automation and data exchange in the manufacturing technology industry require talents who are well versed in new technologies. Robotics, AI and 5G are merely examples of technologies that are utilised in the new industrial revolution. **As adoption of such technologies, or generally speaking Industry 4.0, is considered to be lagging behind in Hong Kong, there is a need to develop more students with advanced skills in Industry 4.0 to support the growth of the industry.**

Knowledge of Regulatory Compliance across Markets

In view of the increasing demand in regulatory compliance, there is a need to cover relevant compliance specifications in training programmes. In-service training on compliance manual development as well as qualification programmes for professionals who provide testing and certification services for the industry are also on demand.

Employees with adequate English proficiency should prepare oneself for jobs in this niche area.

Multi-disciplinary Talents

With the changing nature of the industry from manufacturing-based to manufacturing services, **manpower having technical background, yet with experience in project management, product design and development, supply chain management, intellectual property protection are essential to the workforce.**

Soft Skills not to be Overlooked

In addition to fundamental technical skills, **positions in high demand like project management require a range of soft skills, including organisation skills, communication skills and problem-solving skills.** In particular, language skills facilitating workplace communication also need to be strengthened to maintain competitiveness against young talents in the region.

RECOMMENDATIONS

The following recommendations are proposed to various stakeholders for consideration.

Government

Reviving the Manufacturing Technology Industry from the Root Cause

- a. To open industrial sites with reasonable application requirement and adequate resources for manufacturers to relocate or re-establish suitable manufacturing plants in Hong Kong to **support reindustrialisation**.
- b. To provide resources for **talent development in research and innovation** so that talents with innovative power can be nurtured to promote an innovation-led economy.
- c. To organise events to **promote the innovation-centric and technological image of the manufacturing technology industry** to the public so that the traditional “blue collar” perception can be washed off.
- d. To provide **incentives to encourage employers to open more positions for student interns** which helps students gain work exposure and practical experience and better understand the career prospect of the industry, and increases the appeal of the industry.

Industry

Pursuing Technical Design, Innovation and Services for Industrial Advancement

- a. To stay tune with the development of **new technologies**, particularly those related to Industry 4.0, so that those with high readiness can be applied to manufacturing processes in Hong Kong and elsewhere, such as the Greater Bay Area.
- b. To invest manpower and resources to the **research and development of high-value added products and services** such as smart product design, innovative process development and protection of intellectual property.
- c. To **explore the Mainland and new markets with high consumption power** as the next normal for Hong Kong’s manufacturing technology industry.
- d. To collaborate with schools and training institutions in organising **events and industrial visits locally or in the Mainland showcasing the industrial development, career prospect and success stories of the industry to the public, particularly youth and their parents**.

Training Institutions

Empowering Tech-savvy with Multi-disciplinary and Soft Skills

- a. To prepare a pool of **tech-savvy workforce with multi-disciplinary skill sets** to excel in the manufacturing services sector, such as Industry 4.0, project management, product design and development, supply chain management, testing and certification, etc, so as to address the changing nature of the manufacturing technology industry in Hong Kong.
- b. To implement **project-based learning with design thinking elements** where students take the lead to exercise multi-disciplinary knowledge and skills to identify solutions with industry partners for real-life, authentic, or industry-based problems while **project mentors** can facilitate and groom students' intrapersonal and interpersonal skills.
- c. To provide students with opportunities for **project pitching** so that language skills, presentation skills, communication skills, confidence, perseverance and agility can be nurtured.
- d. To provide **professional programmes in testing and certification or compliance requirements** in different markets with overseas institutions relevant to manufacturing technologies to fill the gap in local support.

Employers

Nurturing a Pool of Tech-savvy with Innovative Power

- a. To **recruit interns or apprentices from training institutions** so new blood is being engaged to the industry and particularly the company at an early stage which helps nurture new blood with expected technical know-how and attitude and maximise fillings of openings.
- b. To provide **education allowance to train staff in advanced technologies**, especially those related to Industry 4.0, and other multi-disciplinary skills through funding scheme such as the Reindustrialisation and Technology Training Programme under the Innovation and Technology Fund.
- c. To maximise employees' **international exposure** and encourage **knowledge exchange** of innovative exposure with counterparts to facilitate organisational growth.
- d. To use **job titles worthy of the name** in job advertisements so as to reflect the rank, qualification and salary of the post.

Graduates & Employees

Being a Multi-disciplinary Talent with Technical Know-how

- a. To invest time in **life-long learning to widen multi-disciplinary capabilities** of project management, product design and development, deepen knowledge of Industry 4.0 for authentic application, and strengthen language proficiency.
- b. To build on their perceived strength of **business acumen** and develop professional knowledge to sustain competitiveness against talents in the region.