Current development of VPET and industry collaboration in the engineering sector in Hong Kong

Siu-Ming Choy

Engineering Discipline, School for Higher and Professional Education (Sha Tin), Vocational Training Council, Hong Kong

vchoy@vtc.edu.hk

Abstract

Nowadays, Vocational and Professional Education Training (VPET) aims for the development of professional knowledge, practical skills, and personal growth for academic and career prospects. With sustainable development with the master of skilled workers in trades, a well-structured training system has developed in different countries. Some developed countries such as the United Kingdom, United States, Germany, and Singapore, have developed their training system. These trades have required practitioners to conduct mandatory training before they admit to the trades. In China, a long tradition for the mode of skills transfer from the master to protégé has developed in construction tradesmen. In Hong Kong, starting from the 1950s, a dramatic increase of skilled workers was required for industrial development. At that time, apprentices only needed to acquire basic technical skills and on-job training to fulfil basic job requirements. To enhance the training scheme in Hong Kong, the Government enacted an Apprenticeship Ordinance in 1976 to promote apprenticeship training to young people, regulate the employment of apprentices in designated trades, and supply well-trained skilled manpower for industry development. The apprentice has a job in an industry at a designated trade and studies a complementary course in Vocational Training Council (VTC) for VPET. The Office of the Director of Apprenticeship (ODA) in VTC is statutory to monitor the progress of the apprentices and promote apprenticeship training. To enhance industry collaboration, institutions in VTC such as Hong Kong Institute of Vocational Education (IVE) and Youth College (YC) have maintained very close contact with relevant industries for collaboration, schemes including Industry Attachment, Work Integrated Learning, and Workplace Learning and Assessment to current students to apply their professional skills and acquire on-job training skills and industrial development in future careers.

This paper reviews the vocational training and apprenticeship in Hong Kong, discusses the current development of the collaboration of VPET and stakeholders between the institutions, and under the apprenticeship scheme with case studies; and summarises the overall strategies in VPET which can be referenced as a model to stakeholders to enhance the recognition of the industry for future development.

Keywords: *Vocational and Professional Education Training, Apprenticeship training, Vocational Training Council, Hong Kong Institute of Vocational Education, Industry collaboration*

Introduction

The apprenticeship training system is important to ensure a continuous supply of the master of skilled workers to meet the manpower and development needs of local industries in Hong Kong. Before the 1970s, apprenticeship training was primarily available in large companies, especially in large enterprises and utility companies, with different systems and practices. These systems and their modes of operation were not subject to regulations and monitoring of the Hong Kong government other than under the Employment Ordinance, Chapter 57 (HKSAR Government, 1970). An apprenticeship training system was formally introduced in 1976 whilst the Government enacted an Apprenticeship Ordinance, Chapter 47 (HKSAR Government, 1976). This Ordinance specifies provisions governing the employment and working conditions for apprentices in specific trades, with the intent of safeguarding the interest of apprentices who are still minors at the time of the apprenticeship training.

Trends of industries in Hong Kong

Local industries in the 1970s were dominant in the manufacturing and construction sectors. The local industries in Hong Kong encountered drastic social, economic, and technological changes, including three main issues. Firstly, a lot of local manufacturing industries started moving to China and countries in South East Asia, where labour and other production costs were relatively lower; Secondly, the drastic technological changes and aspiration of Hong Kong to become a

financial and service centre of the region have transformed Hong Kong into a knowledge-based economy, which require the staunch support of a workforce with higher academic qualifications, advance technological knowledge, and a higher level of professional competence (ITEA, 2000). Lastly, the development of compulsory education and rapid expansion of tertiary education in Hong Kong, resulting in students having more opportunities of attaining a higher qualification at degree and professional level. At the same time, students and their parents are no longer satisfied with jobs of a craft and technical nature and with little promise of upward mobility. Owing to the drastic changes explained above, apprenticeship training in its current form is becoming less welcomed by young people and their parents. This is also reflected from the feedback of industry stakeholders, especially in the electrical, mechanical, and construction sectors, that they are facing difficulties in recruiting an adequate number of young people to join the industries as skilled workers. Therefore, the continuous development and promotion of apprenticeship training in Hong Kong are becoming more important with a view to enhancing the effectiveness of the training and attractiveness to young people to join the sector (Pavlova, 2009).

Overview of VPET in Hong Kong

Under the existing education system in Hong Kong, few secondary students will opt for VPET at the early stage of their secondary education. About 95% of secondary students will stay in the mainstream education aiming to excel at the Hong Kong Diploma for Secondary Education (HKDSE) examination, irrespective of their learning ability, career aspiration, and personal interest. According to past statistics, about one-third of the secondary students are unable to attain the minimum requirement in HKDSE examinations to continue their studies at a degree or sub-degree level. These students switch to VPET and apprenticeship training before they join the labour market for employment. To recognise the value of VPET in Hong Kong's sustainable development, the Government set up a task force for the promotion of VPET in 2018 to consider measures necessary to support the promotion of VPET in Hong Kong (Education Bureau, 2020). The Task Force recognised that the major challenge was in changing the public's perception of VPET as an inferior choice relative to academic articulation pathways. The Task Force has made a list of recommendations focusing on the promotion and publicity of VPET as well as building an articulation ladder for VPET from secondary up to higher education level.

VPET system in other countries

Some countries in Europe, United Kingdom, United States, Germany and Singapore, they have developed their training system of the trades. These trades have required practitioners to conduct mandatory apprenticeship training before they admit to the trades. In China, a long tradition for the mode of skills transfer from the master to protégé has developed in construction tradesmen. The comprehensive and effective education and training system for producing skilled craftsmen, which has been developed from a long history of craftsmanship training tradition. The following features are found in the VPET systems from these countries:

(a) VPET forms an integral part of the national education system and is usually available at various stages of the education ladder from lower secondary level to higher education level. It is highly regarded by members of the society and welcomed by students and their parents as a means to access respectable employment;

(b) VPET usually starts after the completion of basic or compulsory education. Statistics in these countries show that a large percentage of teenagers (e.g. about two-third of students in Switzerland) will choose VPET after the lower secondary education;

(c) Dual-track mode is the most common and effective form of VPET and generally preferred by apprentices or vocational trainees;

(d) Upon completion of their training, apprentices or vocational trainees will usually be certified as skilled workers and will have acquired a qualification recognised for employment for specific trade or profession;

(e) Apprenticeship training is mostly funded by the central and local government and enterprises in the private sector. Apprentices are paid while receiving training, and are entitled to various allowances and benefits offered by the government and enterprises; and

(f) Apprentice graduates who aspire to pursue further education will have the option to continue their studies at a higher education level.

These features provide useful references for Hong Kong in the development of its VPET and apprenticeship training system (Middleton, 2009).

Current development of VPET and industry collaboration in Hong Kong

Student industrial attachment programme in the engineering sector

The student industrial attachment programme in VTC is "work-based experience programme" providing a real-life organisational context for students to develop specific or generic skills, valuable to their professional development in VPET. Students can apply and enhance

their skills in reality, contribute to the organisation, and, at the same time, obtain invaluable guidance from their mentors (Vocational Training Council. 2023). All full-time IVE/HKDI Higher Diploma students are eligible to participate in this programme. In the engineering discipline, attachment students are able to provide assistance in the following areas:

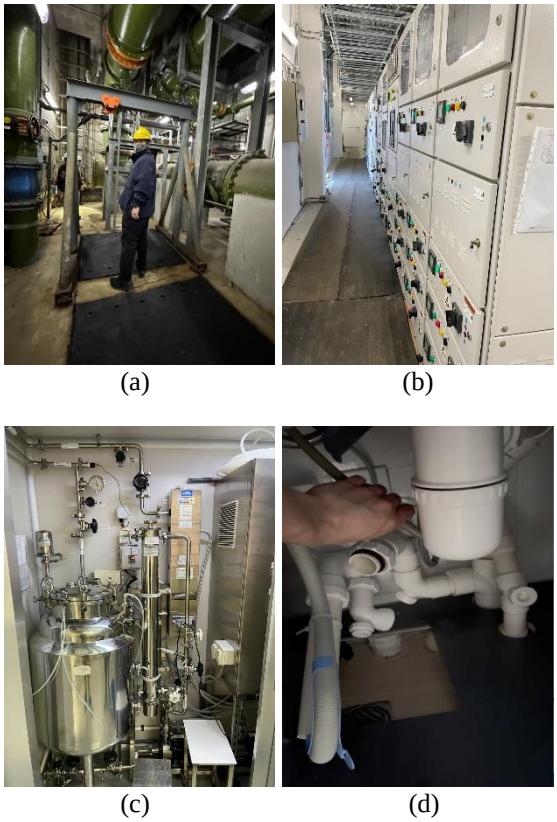
(a) Conduct a survey on existing equipment/services and user needs;

(b) Draft a project plan and develop theoretical and engineering solutions to specific problems;

(c) Perform experimental or investigatory work;

(d) Build and test hardware and/or software; and

(e) Provide a cost analysis of development and/or production where appropriate.



(a) (b)

(c) (d)

Figure 1: Examples of projects participated in the student industrial attachment programme in the engineering sector (a. sea water pump system near Victoria Harbour, b. power supply system in one of the main bridges, c. water treatment and purification system in the cosmetics industry, d. plumbing system inspection in a residential building).

During the attachment period, engineering students can strengthen their engineering skills and they could find a practical topic to conduct an Industry-Based Student Project (IBSP) during their final year of study. For example, full-time students with Higher Diploma in Building Services Engineering are attached to different companies to participate in a wide variety of projects. Figure 1 shows some examples of the projects participated in, such as the seawater pump system near Victoria Harbour, the power supply system in one of the main bridges at Kong Kong, the water treatment and purification system in the cosmetics industry, and plumbing system inspection in a residential building.

Apprenticeship training and support to industries

Apprenticeship training is one of an integral part of the VPET systems in Hong Kong and is elicited in the Apprenticeship Ordinance. A young person of 14 to 18 years of age may be employed in a designated trade (DT), only if he is employed as an apprentice under a valid contract of apprenticeship and the contract is registered with the ODA. The registration of the contract is compulsory under the Ordinance (Compulsory Registration). The Ordinance however does not require the registration of apprenticeship contracts of persons aged 19 and over in DTs. Employers however may register voluntarily such contracts with the ODA under the Ordinance (Voluntary Registration). There are 45 DTs specified by the Apprenticeship (Designation of Trades) (Consolidation) Order. All of them are in the manufacturing, construction, engineering services sectors of local industries. Trades or occupations outside the list of designated trades specified in the Order are generally referred to as non-designated trades (NDTs).

Typically, an apprentice will spend four and half days per week for on-the-job training in the workplace of his employer, and one day plus one to two evenings each week in classrooms of VTC for learning theories and technical knowledge of the related trade. The period of apprenticeship training for individual trades varies from trade to trade, ranging normally from three to four years.

In some trades, employers and apprentices generally feel that the periods of apprenticeship for their trades are too long. They have expressed that the periods of apprenticeship for their trades were determined decades ago. Technological advances in recent years have changed not only the manufacturing processes but also the mode of business transaction. The key skills of a trade to be transferred to apprentices are significantly different from those in the 1970s. With modern teaching and learning and teaching strategies being used today, apprenticeship training could be done faster and completed within a shorter period of apprenticeship. It is therefore to design a 2-year NDT to rationalise the period of apprenticeship, trade titles with job titles adopted by most employers.

ODA registers apprenticeship contracts under the Apprenticeship Ordinance for the benefits of employer and apprentice. The apprenticeship officers of the ODA conduct routine visits to ensure the training facilities of the employer are in place, and registered apprentice training is in good progress. Figure 2 shows an example of a routine visit to apprentices who are working in a commercial building in a refrigeration/air-conditioning trade. The apprenticeship officers can conciliate disputes between employer and apprentice when necessary (Office of the Director of Apprenticeship, 2023).

(a) (b)

Figure 2: A routine visit to apprentices working in a commercial building (a. on-site work, b. air-conditioning facilities).

Earn and Learn Scheme

The Earn & Learn Scheme (ELS) was implemented by VTC in 2014 with funding provided by the Government. As shown in Figure 3, the scheme includes three parties: the Hong Kong government, employers, and VTC. The Scheme is intended to attract young people to pursue vocational education and develop a career in industries or trades requiring specialised skills as well as facing labour shortage and ageing problems. The ELS is introduced to industries due to three main criteria. Firstly, the industry is facing labour shortage or/and ageing problems and it has difficulties in hiring and retaining young people. Secondly, the relevant trades are very specialised with a high level of technical content. Thirdly, the industry is committed to providing allowance and subsidy to trainees and to offer a certain salary level to trainees who have completed the apprenticeship training and are willing to join the relevant industry. Under the Scheme, an apprentice will be enrolled in a designated programme at VTC and the apprentice will sign an apprenticeship contract with an employer, and start learning practical skills at the workplace. At the same time, he will continue his study of the vocational programme on a part-time basis. During the apprenticeship training period, the apprentice will receive a salary at a guaranteed level from his employer and will receive various incentive allowances from both the employer and the Government. The salary level upon completion of the training is also guaranteed. The implementation of the ELS is considered successful in enhancing the attractiveness of apprenticeship training to young people. This can be seen from the increase in the number of apprentices from below 4,000 to around 5,000 apprentices each year since its introduction in 2014.

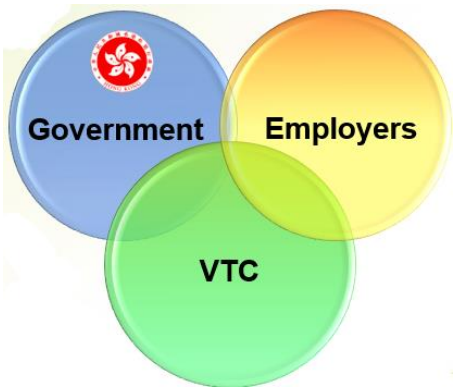


Figure 3: Three parties are involved in the ELS.

Workplace Learning and Assessment and Pilot Incentive Scheme to Employers

To further enhance the effectiveness of ELS, VTC has introduced a pilot scheme of Workplace Learning and Assessment (WLA) in 2019. The WLA mechanism is designed and developed by VTC regarding the dual-track model practised in other countries. Qualified trainers, verifiers, and assessors appointed by the employers will be engaged to conduct training and assessments of the apprentices at the workplace. The outcome of the assessment will be reported in a web-based system and monitored by the relevant academic disciplines of VTC. Professional workshops will be held by VTC for trainers and assessors on the assessment mechanism and skills. The WLA allows assessment of the apprentices' performance and competencies at the workplace at the same time and helps reduce the learning time spent by apprentices in classrooms. The above schemes are in line with the recommendation of the Task Force on the promotion of VPET which advised the Government to identify ways to facilitate better alignment between the classroom and work-based learning, to implement a dual-track learning mode. To help employers meet the additional manpower resources incurred in the WLA mechanism, the Government has introduced a Pilot Incentive Scheme to Employers (PISE) which employers will be paid an incentive allowance per apprentice after the start of assessments of the apprentices.

Student Exchange Programme for current students and International Study Programme for apprentices

To broaden the perspectives of current students, tap insights from industries abroad, and enhance professional knowledge, students had opportunities to widen their global horizons through range of outbound student

exchange programmes in the United Kingdom, Australia, Japan and Singapore etc.

On the other hand, the International Study Programme was introduced in recent years to allow apprentices an opportunity to gain experience and exposure by studying short-term technical/practical courses and visiting local institutions/companies. In 2019, 14 apprentices from electrical, electronic, mechanical, construction, building Services, air-conditioning, and automobile engineering trades participated in a 2-week exposure programme in London, United Kingdom with different activities participated, shown in Figure 4.

(a) (b)

(c) (d)

Figure 4: Apprentices participated in different activities during the International Study Programme in 2019 (a. specialist lecture, b. practical workshop, c. industrial visit in a construction site under construction, d. industrial visit of a workplace with building services system).

Conclusions

The vocational training and apprenticeship in Hong Kong are embedded in the VPET system and governed by legislation that is enacted to safeguard the interest of apprentices who are still minors at the time of training. The system is monitored closely by a team of dedicated staff in VTC, who maintains close dialogues with employers and other stakeholders in industries; and staff in teaching departments in VTC, who deliver academic professional knowledge through the vocational programme to both current students and apprentices. The system is fully supported by the Government and industries, through policies and funding. To adapt to the fast pace environment and sustainable development in Hong Kong, a regular review on the training and support scheme implemented by the VTC to enhance vocational training and apprenticeship (Cribbin & Kennedy, 2002). Suggestions including increasing incentives for employers, strengthening its dual-track learning mode, enhancing its industrial collaboration and workplace learning and assessment. Such strategies can be referenced as a model to stakeholders to enhance the recognition of the industry for future development.

References

Cribbin, J., & Kennedy, P. (2002). *Lifelong learning in action: Hong Kong practitioners' perspectives*. Hong Kong: Hong Kong University Press.

Education Bureau. (2020). *Promotion of Vocational and Professional Education and Training*. Hong Kong: Hong Kong Special Administrative Region (HKSAR) Government, Retrieved from www.edb.gov.hk/en/edu-system/other-edu-training/vocational-other-edu-program/promotion-vet.html.

HKSAR Government. (1970). *Employment Ordinance (Cap. 57)*. Hong Kong: Hong Kong Special Administrative Region (HKSAR) Government, Retrieved from www.elegislation.gov.hk/hk/cap57.

HKSAR Government. (1976). *Apprenticeship Ordinance (Cap. 47)*. Hong Kong: Hong Kong Special Administrative Region (HKSAR) Government, Retrieved from www.elegislation.gov.hk/hk/cap47.

ITEA. (2000). *Standards for technological literacy: Content for the study of technology*: International Technology Education Association (ITEA).

Middleton, H. (2009). Problem-solving in technology education as an approach to education for sustainable development. *International Journal of Technology and Design Education, 19*, 187–197.

Office of the Director of Apprenticeship. (2023). Apprenticeship Scheme in Hong Kong. Retrieved from https://apprenticeship.vtc.edu.hk/en/

Pavlova, M. (2009). *Technology and vocational education for sustainable development*. Netherland: Springer

Vocational Training Council. (2023). Student Industrial Attachment Programme. Retrieved from www.vtc.edu.hk/en/home/industry-partnership/student-industrial-attachment-programme/overview.html