



Research Office
Legislative Council Secretariat

Information Note

Vocational and Professional Education in Germany and Singapore

IN01/2022

1. Introduction

1.1 In Hong Kong, the Government is keen to develop vocational education as an attractive progression pathway for youth, as seen in its rebranding as “vocational and professional education and training” (“VPET”) in 2016 and the establishment of a dedicated steering committee for its further promotion in 2020.¹ In spite of new initiatives, the overall share of students taking vocational courses at the upper secondary level hovered around 15% during 2015 to 2020, through enrolling in basic vocational courses mainly provided by the Vocational Training Council (“VTC”) and taking Applied Learning (“ApL”) subjects in the Hong Kong Diploma of Secondary Education (“HKDSE”). That is far behind the average figure of 43% for the Organisation for Economic Co-operation and Development (“OECD”) in 2019. While the participation rate of VPET at the post-secondary level rose from 28% in 2000 to 33% in 2019 amidst rapid expansion of self-financing institutions in the 2000s,² there is still an “entrenched biased perception” in the local community that VPET is a less desirable progression pathway relative to the academic stream.³ As the structural transformation of the local economy gives rise to a need for more diverse talents with stronger knowledge and skills, there are continued calls to strengthen the promotion of VPET in Hong Kong. In the Legislative Council (“LegCo”), Members discussed the subject of VPET on at least 19 occasions during 2016 to 2021. Most recently on 26 May 2022, a motion entitled “Promoting the development of vocational education and nurturing talents to establish multiple pathways” was passed in LegCo.⁴

1.2 At the request of Hon Dennis LEUNG Tsz-wing, the Research Office has conducted a study on pre-employment VPET for youth in Germany and Singapore.⁵

¹ The rebranding to VPET in 2016 is meant to highlight the professional elements in vocational education at the post-secondary level, on top of basic elements in secondary education.

² The figure in 2000 was calculated based on full-time enrolment in the Hong Kong Institute of Vocational Education (“IVE”) and universities funded by the University Grants Committee at sub-degree and undergraduate levels. That for 2019 included self-financing institutions which emerged after 2000 (details at paragraph 3.5 below).

³ Task Force on Promotion of Vocational and Professional Education and Training (2020).

⁴ Legislative Council (2022).

⁵ VPET includes pre-employment education for younger students and in-service training for existing workforce. This short piece focuses on the former.

While the German dual-track system (i.e. combining school-based and work-based learning) is highly acclaimed worldwide for nurturing diverse talents, the Singaporean initiatives launched after 1992 make VPET a popular choice for school leavers there.⁶ This *information note* begins with a summary of global trends, followed by discussion on VPET in Hong Kong, Germany (focusing specifically on its dual-track system) and Singapore which covers: (a) overview of their VPET frameworks; (b) tripartite collaboration between the government, business and institutions; and (c) prospects for VPET students. A summary table comparing the three places is provided in **Appendix** for easy reference.

2. Recent global trends in VPET

2.1 Globally, **there has been renewed interest in vocational education amongst advanced places over the past decade or so**, primarily as a response to the chronic problem of elevated youth unemployment allegedly attributable to their supposedly “lower employability due to absence of basic skills”. Taking OECD as an illustration, the unemployment rate of youths aged 15-24 averaged at 14.7% during 2010 to 2020, twice the corresponding figure of 7.1% in the entire labour force (the corresponding figures in 2019 were 11.8% and 5.4% respectively). Average youth unemployment rates in Hong Kong and Singapore, meanwhile, were lower at 10.1% and 9.2% respectively during 2010 to 2020 (and were 8.5% and 7.7% in 2019). VPET apparently can equip youth with “the knowledge, skills and competencies required to carry out a specific occupation”, thereby facilitating their school-to-work transition.⁷ Indeed, a global study indicated that “substantial workplace training” can help graduates’ transition into work, because, as work experience is increasingly valued by employers, students with workplace training have a competitive edge when entering the labour market. Adequacy of on-the-job training, therefore, often holds a key to differentiating between strong and weak VPET programmes.⁸ In addition, as the modern workplace is becoming more unpredictable amid rapid technological changes (e.g. digitization and automation), VPET may complement academic-oriented education and potentially endow the workforce with more diversified skills to meet new challenges in the longer term.

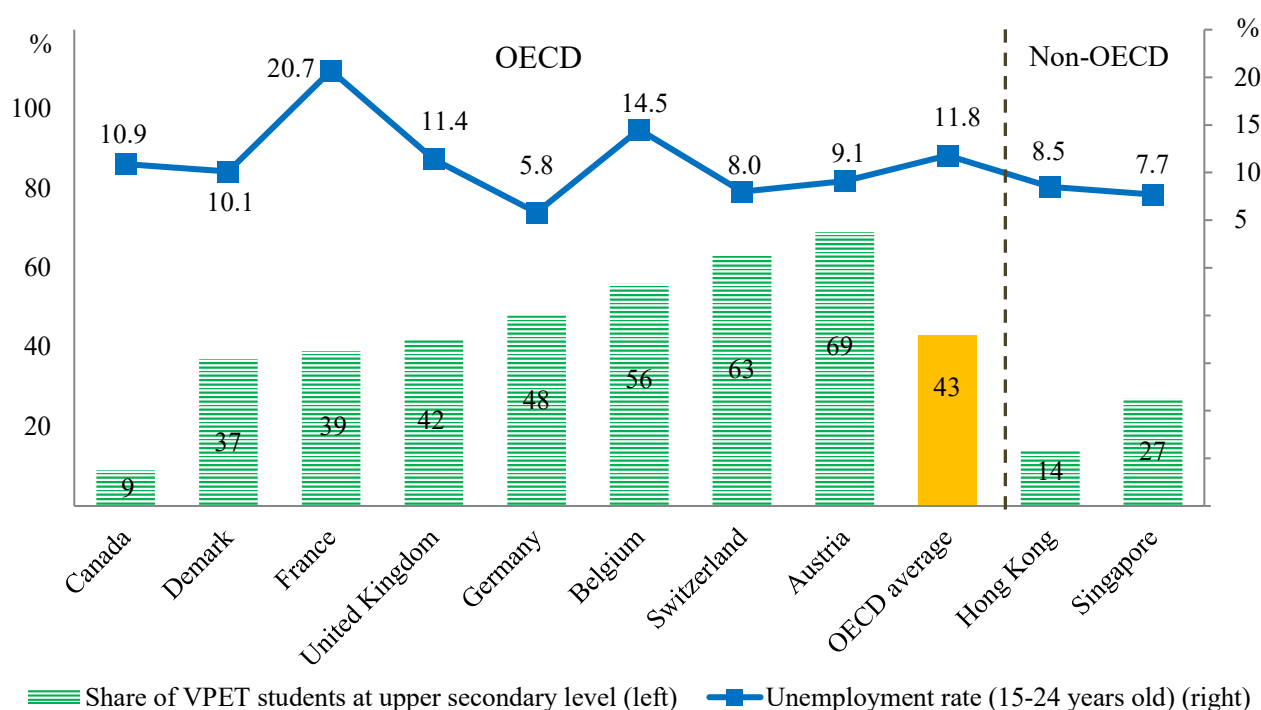
⁶ Organisation for Economic Co-operation and Development (2011, 2018), International Labour Organization (2017) and World Bank (2012).

⁷ Organisation for Economic Co-operation and Development (2016, 2020a).

⁸ National Center on Education and the Economy (the United States) (2018).

2.2 On average, the share of upper secondary students in OECD enrolled in vocational programmes stood at a respectable level of 43% in 2019, although figures for individual member states could range very widely (from a low of 9% in Canada to a high of 69% in Austria) due to differences in education systems and economic structures (Figure 1)⁹. While higher levels of VPET enrolment are generally associated with lower youth unemployment rates, other factors such as labour market rules and practices as well as effectiveness of organization and design of VPET programmes also matter.

Figure 1 – Youth unemployment and proportion of VPET students⁽¹⁾ in Hong Kong, Singapore and selected OECD member states, 2019



Note: (1) Upper secondary level.

Sources: Organisation for Economic Co-operation and Development (2021, 2022), Census and Statistics Department (2021), Ministry of Education (2021a) and data.gov.sg (2022).

⁹ For VPET at the post-secondary level (i.e. degrees and sub-degrees), OECD does not compile comparable statistics, partly because some vocational subjects and disciplines at higher levels (e.g. nursing, social work and engineering) can be taught in both vocational institutions and conventional universities which may not provide breakdown between VPET programmes and academic programmes.

2.3 On promotion measures of VPET, governments of advanced places generally take the following multi-pronged measures:

- (a) Rolling out initiatives to elicit **support from businesses to promote work-based learning or workplace training**, with some governments offering financial incentives (e.g. subsidies in the United Kingdom (“UK”) and France) and expertise support (e.g. training for apprentice supervisors in Norway);
- (b) Establishing mechanisms to **incorporate views of businesses in the formulation of VPET policies** so as to ensure that training provided will remain relevant to the evolving market demand and thus effectively support school-to-work transition;
- (c) **Extending VPET to more economic sectors**, so apprenticeships are now seen in more service or high-technology sectors in OECD (e.g. Ireland and Switzerland);
- (d) **Uplifting the status of VPET** through setting up specialized universities (e.g. Universities of Applied Sciences (“UAS”) in Finland) to offer degrees in vocational subjects at both undergraduate and post-graduate levels; and
- (e) Creating clearer progression pathways by recognizing qualifications of vocational subjects offered under the secondary school curriculum, putting them **on par with academic subjects** (the UK, as an illustration, launched T-Level courses in 2020 which have an equal footing with A-Level subjects).

2.4 Notwithstanding the above measures and achievements, VPET and its pathways in OECD member states cannot be entirely immune from negative public perceptions. According to a recent study completed by OECD in 2018, vocational education is still seen as a “provision fit only for other people’s children”, whereas academic routes culminating in university study is still regarded as the “gold standard”.¹⁰ Actually, after years of expansion in university education places and decades-long low fertility rate, youth find it easier to enrol in the mainstream of general education, resulting in greater challenges in recruiting VPET students at the post-secondary level. In addition, as more middle-skill jobs (e.g. machine operators and craftsmen) are at risk of being phased out in the knowledge-based economy, VPET programmes in such fields have lost their

¹⁰ Organisation for Economic Co-operation and Development (2018).

attractiveness.¹¹ Given a study finding that as many as 49% of global work tasks could potentially be automated in the long run, how to align job-specific training with the rapidly changing needs in the labour market is becoming a new challenge to VPET.¹²

3. VPET in Hong Kong

Overview

3.1 In Hong Kong, the unemployment rate of youth aged 15-24 averaged at 10.1% during 2010 to 2020, almost three times the corresponding figure of 3.5% for the entire labour force. Given the perception that VPET could be a means to reduce youth unemployment, there was continued advocacy in Hong Kong for enhancing VPET development and strengthening its promotion as a desirable progression pathway.

3.2 Hong Kong has a long history of providing VPET-type programmes.¹³ The Government set up the Industrial Training Advisory Committee in 1965 and the Hong Kong Training Council in 1973 to, among other things, study the matter. Consequently, the then Hong Kong Polytechnic was established in 1972, and the Apprenticeship Ordinance was enacted in 1976 to protect apprentices aged 18 or below in designated trades. **The establishment of VTC as a permanent and statutory body dedicated to vocational education under the Vocational Training Council Ordinance in 1982 was a milestone development.** Its 13 member institutions now offer a wide range of VPET programmes,¹⁴ including pre-employment programmes at upper secondary and post-secondary levels for over 40 000 students annually (**Figure 2**)¹⁵.

¹¹ For instance, the share of middle-skill employment in OECD declined from 42% in the mid-1990s to 32% in the late 2010s. See Organisation for Economic Co-operation and Development (2020c).

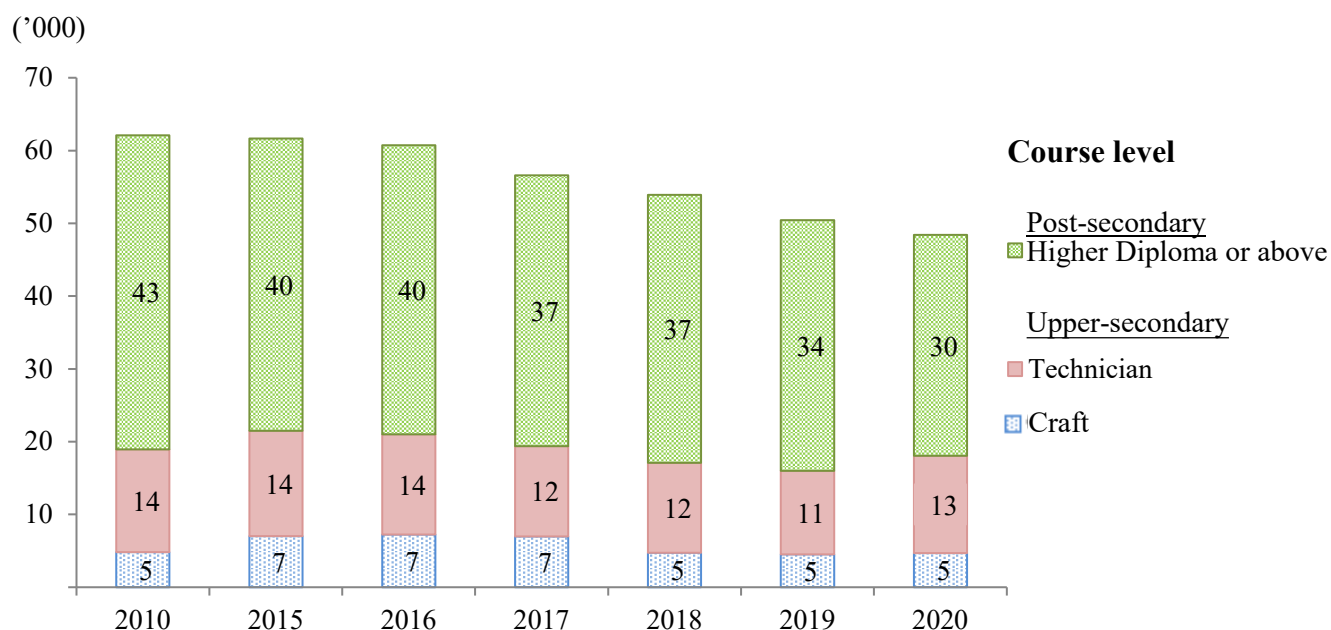
¹² McKinsey Global Institute (2017).

¹³ In 2015, the Research Office completed an *Information Note* entitled “Review of development of vocational education in Hong Kong”, tracing the historical evolution of vocational education in Hong Kong since 1932. See Legislative Council Secretariat (2015a).

¹⁴ VTC enrolls some 200 000 students and trainees annually, but only one-fifth of them are students in pre-employment education. The rest are engaged in in-service training courses that could last only for a few days or weeks. See Vocational Training Council (2021).

¹⁵ In 1999, VTC merged nine technical institutes/colleges to form IVE, extending vocational education to the post-secondary level. VTC then founded the School for Higher and Professional Education (“SHAPE”) in 2003 and the Technological and Higher Education Institute of Hong Kong (“THEi”) in 2012 to offer top-up and four-year bachelor’s degree programmes.

Figure 2 – Number of students of VTC by course level

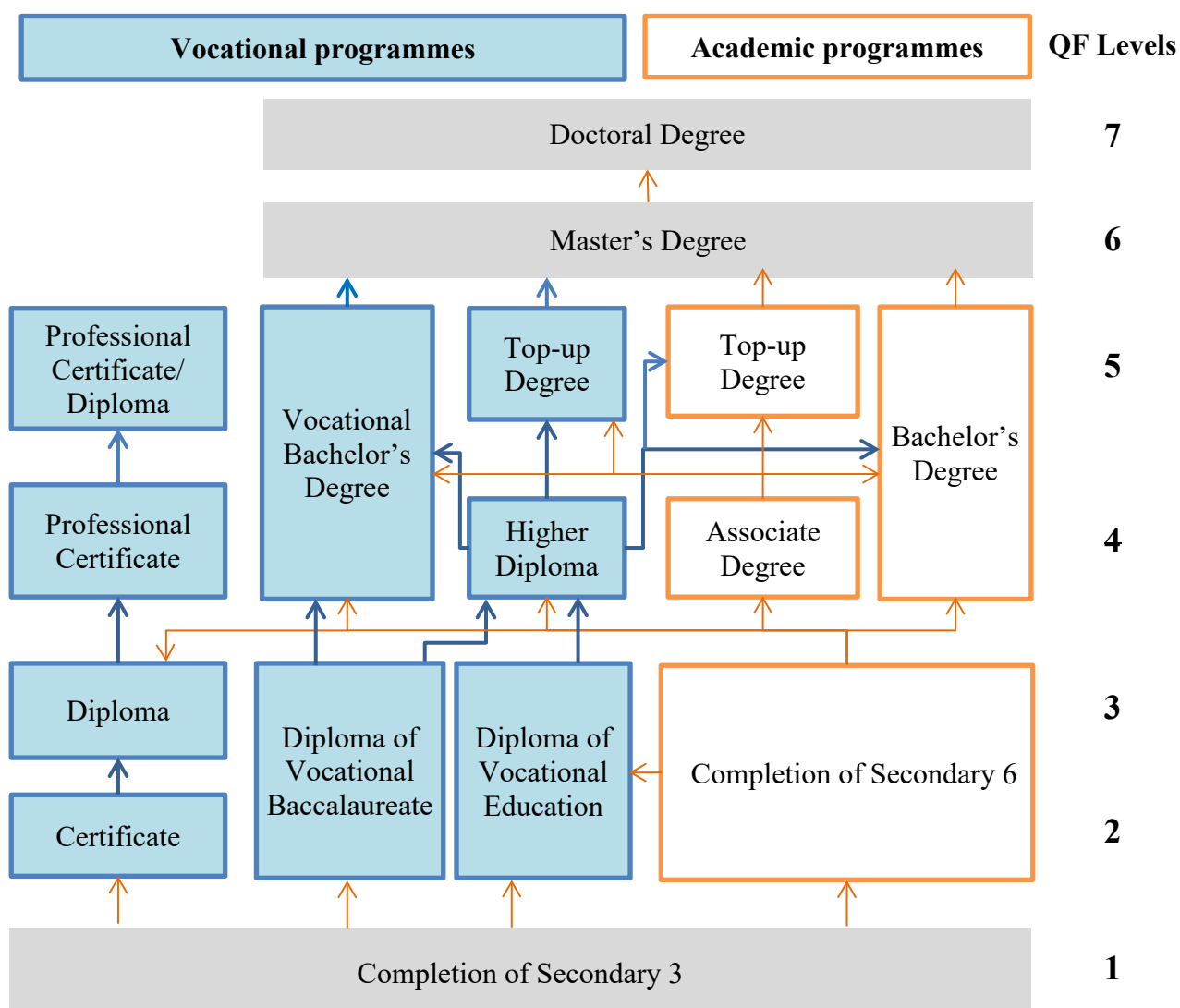


Source: Census and Statistic Department (2021).

3.3 Upon the introduction of the Qualifications Framework (“QF”) in 2008, VPET programmes are formally recognized in the seven-level qualification hierarchy.¹⁶ More importantly, progression pathways between academic and vocational streams have become more permeable and flexible (**Figure 3**).

¹⁶ Apart from VTC’s member institutions, there are over 30 VPET providers, including statutory bodies for training (e.g. the Construction Industry Council), corporate academies (e.g. MTR Academy) and 27 self-financing post-secondary institutions.

Figure 3 – Key VPET qualifications under local Qualification Framework



Source: Task Force on Promotion of Vocational and Professional Education and Training (2020).

3.4 At the upper secondary level, VTC provides different courses for school leavers from Secondary 3 or above, including (a) industry-specific certificate programmes lasting from a few weeks to two years; or (b) three-year Diploma in Vocational Education (“DVE”) programmes which combine vocational and generic education. Besides, VTC is still operating an apprenticeship scheme for youth in 45 designated trades (e.g. electricians, construction technicians and air-conditioning mechanics).¹⁷ They are sponsored by employers to take relevant

¹⁷ Employers who wish to employ such apprentices must enter into contracts registered with VTC. Meanwhile, those who have hired apprentices aged above 18 or in non-designated trades may also register, on a voluntary basis, the relevant contracts with VTC.

training courses (e.g. DVE courses).¹⁸ For students in **mainstream secondary schools**, they can also choose one or two **ApL courses (in six vocational fields) as their elective subjects in HKDSE**.¹⁹ Yet the participation rate in **VPET at the upper secondary level in Hong Kong is considered low vis-à-vis overseas advanced places**. In 2020, apart from some 18 000 students enrolled in certificate/diploma courses provided by VTC,²⁰ only 8 000 students in about 340 schools took up ApL courses. Youth enrolled in these upper secondary VPET programmes combined, consequently, accounted for **around 15% of upper secondary students (including those in mainstream schools and VTC)**.

3.5 **At the post-secondary level**, apart from programmes offered by VTC, the Government began in 2015 to subsidize students to pursue degree programmes offered by self-financing post-secondary institutions for those sectors with acute manpower shortage (e.g. health care, architecture and engineering), followed by extension to sub-degree programmes in 2019.²¹ PricewaterhouseCoopers estimated that there were some **58 400 students enrolled in VPET-related sub-degree and degree programmes at self-financing institutions and VTC in 2019 (Figure 4)**²². It further estimated that at least 75% of these students studied programmes related to service sectors. The 230 High Diploma (“HD”) programmes made up the largest segment, offering VPET to some 33 100 students²³. While the Government plans to develop applied degrees in practical skills through four pilot programmes offered by self-financing institutions in 2022 at the earliest, there is no plan to set up dedicated UAS-type institutions so far.²⁴

¹⁸ Under the Training and Support Scheme (more details on the scheme are in paragraph 3.8 below), apprentices can attend certain DVE programmes with financial support from both employers and the Government.

¹⁹ The six fields of ApL are (a) creative studies; (b) media and communication; (c) business, management and law; (d) services; (e) applied science; and (f) engineering and production.

²⁰ Apprentices are not counted, as they may overlap with VTC students.

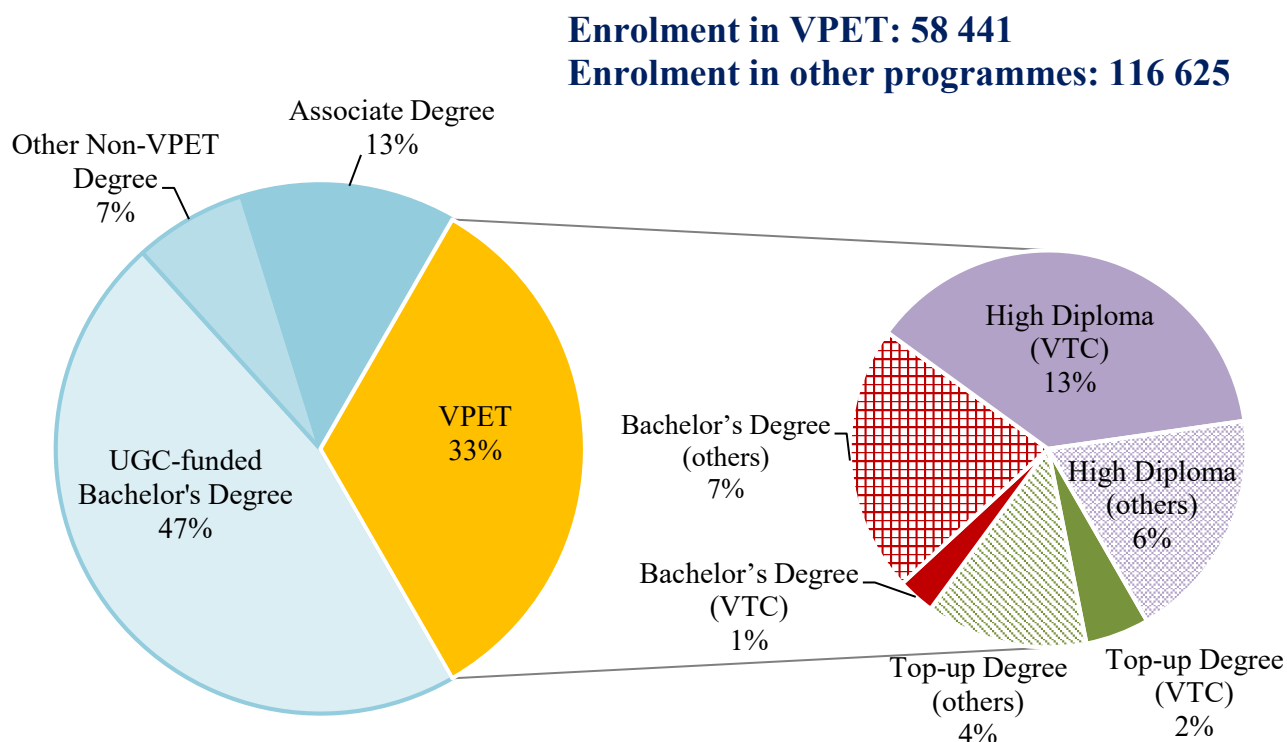
²¹ In 2022-2023, the Government will subsidize 5 576 sub-degree and degree programme places for new admissions, with annual per capita subsidy ranging from HK\$22,120 to HK\$77,040.

²² No breakdown is available for enrolment in VPET programmes offered by University Grants Committee-funded universities.

²³ Committee on Self-financing Post-secondary Education (2017) and PricewaterhouseCoopers (2021).

²⁴ GovHK (2021a).

Figure 4 – Post-secondary students enrolled in VPET programmes in 2019-2020



Sources: PricewaterhouseCoopers (2021) and Committee on Self-financing Post-secondary Education (2022).

3.6 In recent years, the Government has stepped up efforts to promote VPET as a progression pathway for local youth. Under this objective, it has increased engagement with the industry and set up **two dedicated task forces separately in 2014 and 2018**. Vocational education was also rebranded as VPET in 2016. More recently in **September 2020, the Steering Committee on Promotion of VPET and QF** was established to oversee the overall implementation of VPET.

Tripartite collaboration

3.7 **For on-the-job training at the upper secondary level**, arrangements vary across types of programmes. On the one hand, youth engaged in apprenticeship schemes and most VTC's industry-specific certificate programmes can expect to enjoy ample training. On the other hand, situation for students taking courses for DVE (offered by VTC) and ApL (under HKDSE) is less certain: for some DVE programmes, students may have opportunities for workplace

attachment²⁵; for ApL, learning activity arrangements depend on the course providers and there is no mandatory on-the-job training requirement.²⁶

3.8 Regarding on-the-job training under post-secondary VPET programmes, the Government introduced the Training and Support Scheme (“TSS”) in 2014, and regularized it in 2019, to encourage employers to provide training with a guaranteed salary to VTC students taking HD courses.²⁷ With financial support from the Government, there are about 1 200 training places offered by some 300 employers annually. The trainees have a prospect to become full-time employees of the companies concerned upon graduation. In addition, VTC offers internship opportunities to about 9 000 HD students each year under the **Student Industrial Attachment Programme**, covering all HD students with internships no shorter than 90 hours. For self-financing post-secondary institutions, they can apply for funding from the Government’s **Self-financing Post-secondary Education Fund** to support organization of industrial attachment projects for students enrolled in their VPET-related sub-degree and degree programmes.

3.9 Apart from the Steering Committee aforementioned in paragraph 3.6, VTC regularly gauges views from industries on manpower training needs, and the **Government has set up 22 Industry Training Advisory Committees** to involve representatives of employers and employees of pertinent industries in setting vocational competency standards which are intended to serve as benchmarks for VPET providers. Yet, local businesses seem to have limited bearing on course development of VPET. As an illustration, among the 509 VPET sub-degree programmes that were accredited as QF level 4 programmes, only six of them were designed based on competency standards set by the industries in 2021.²⁸

3.10 On financial commitment, despite increased funding initiatives in recent years, resources devoted to VPET remains on the low side. For instance, the

²⁵ Offered under the Student Industrial Attachment Programme, which mainly covers HD students (more details on the programme are in paragraph 3.8).

²⁶ Nevertheless, all ApL courses are quality assured for recognition under QF (QF Level 3), thus may assist graduates to find work in relevant industries if they wish.

²⁷ The Training and Support Scheme (also known as “Earn and Learn Scheme”) covers sectors ranging from engineering and technology to design and personal care. Participating students receive on-the-job training as apprentices while taking VTC courses (including certain DVE programmes) in part-time mode (along with one year of full-time classroom learning or workplace training in some programmes). In addition to a monthly salary of at least HK\$8,000 and a subsidy totalling HK\$30,800 from employers, the students are entitled to a monthly government allowance of HK\$2,000-HK\$3,000. To encourage employers to provide workplace assessment, the Government also offers a financial incentive of up to HK\$36,000 per trainee. See GovHK (2021b) and Vocational Training Council (2022b).

²⁸ Our Hong Kong Foundation (2021).

Government’s recurrent spending on VTC in 2019-2020 (at HK\$3 billion in aggregate, equivalent to 0.1% of GDP) roughly translated to slightly below HK\$60,000 per student, equivalent to just 66% of per capita spending on secondary school students.

Impact on youth

3.11 Concerning **progression pathways**, there is a rising trend of VPET graduates pursuing further study immediately after graduation amidst the expansion of the self-financing sector in higher education. In fact, after completing their two-year HD programmes, which already had 60% of the curriculum dedicated to vocational content, as many as 49% of the HD graduates in 2019-2020 chose to pursue further studies with a view to attaining bachelor’s degrees.²⁹ While this can be seen as an improvement in progression pathways, some observers take it as a hint that the programmes are entirely successful in fulfilling VPET’s objective of preparing students for the workplace when many graduates feel the need for further studies before entering the job market.

3.12 For **career prospects**, there seems to be limited hard evidence or proven statistics to show that the career prospects of VPET graduates are as good as those in academic disciplines in the long run or have improved over time.³⁰ As a result, **about four-fifths (79%) of students surveyed by the Government in 2018 indicated that they were not interested in pursuing VPET, conceivably because it was deemed a less effective pathway to universities and better-paid jobs.**³¹

3.13 Lack of interest among students, combined with the improved chance for getting admitted into eight UGC-funded universities in recent years and the drop in the number of HKDSE candidates (from 73 100 in 2012 to 50 100 in 2022), led to a **decline in uptake of VPET programmes**. For instance, enrolment in VTC’s post-secondary programmes dwindled from 43 000 to 30 000 between 2010 and 2020; and among the 5 472 post-secondary VPET places offered by self-financing institutions and subsidized by the Government in the 2020-2021 academic year, only 72% were filled.

²⁹ Calculated based on data provided by Education Bureau upon request by the Research Office.

³⁰ According to graduate surveys for self-financing programmes in 2018, the average monthly salary of HD graduates was HK\$14,551 in 2018, compared with HK\$13,802 for Associate Degree (“AD”) graduates and HK\$15,930 for university graduates. However, as earning statistics compiled by the Census and Statistics Department do not differentiate between HD and AD qualifications, there are no data to evaluate career prospects of VPET graduates over a longer time span. See Education Bureau (2020a) and PricewaterhouseCoopers (2021).

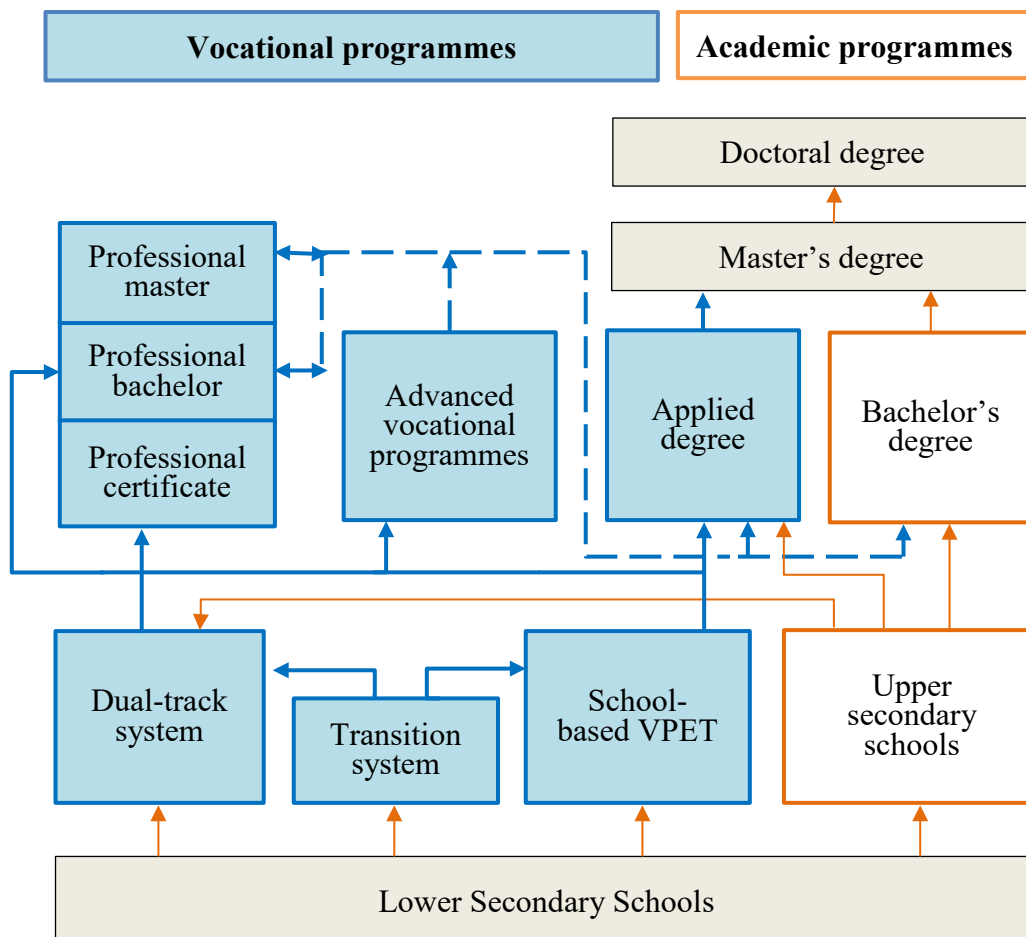
³¹ Task Force on Promotion of Vocational and Professional Education and Training (2020).

4. Dual-track VPET system in Germany

Overview

4.1 Germany is globally acclaimed for its education system, with equal emphasis and respect placed on academic and vocational streams (**Figure 5**). More specifically, the **dual-track VPET system for upper secondary students**, with emphasis on learning through both **apprenticeship** and **classroom teaching**, is well-known for its facilitation of study-to-work transition of aspiring young talents. During 2010 to 2020, the unemployment rate for youth aged 15-24 in Germany averaged at 7.5%, much lower than the OECD average (14.7%) though still somewhat higher than 4.7% for the entire labour force.

Figure 5 – Education system in Germany



Sources: Autorengruppe Bildungsberichterstattung (2020) and CEDEFOP (2020a).

4.2 The dual-track VPET system has the legal backing of the Vocational Training Act enacted in 1969, offering protection to apprentices. Moreover, 79 business chambers³², which companies are required by law to join, represent employers on the **Joint Committee of the Federal Institute for Vocational Training (“JCFIVT”)**³³ in deciding (i) occupation coverage in the dual-track system; (ii) national standards for each occupation; (iii) relevance of curricula and transferability of skills across firms; (iv) how to monitor enterprises offering on-the-job training; and (v) examinations for both trainees and trainers.

4.3 **At the upper secondary level, nearly 50% of students in 2019** (or 970 100 of the two million students concerned) chose VPET programmes. Within the total, **51% went direct into the dual-track VPET system**³⁴. Another 26% enrolled in the transition system, which comprises vocational courses lasting 6-12 months to prepare students who were lower-achievers during their lower secondary years (many of whom were from lower-income or immigrant families) for progression to either dual-track VPET programmes or school-based VPET programmes³⁵.

4.4 It is noted that **at the post-secondary level**, more VPET-oriented degree programmes are being offered as well. The number of **Hochschulen für Angewandte Wissenschaften/Fachhochschulen** (“HAWs/FHs”, which are German equivalent of UAS) expanded by 37% over two decades to over two hundred, making up half of all universities in the country. Consequently, their aggregate share in university student enrolment stood at 36% in 2020, up noticeably from 27% in 2000. Their programmes are also in dual-mode and offer dual certificates (i.e. a recognized vocational qualification and a bachelor’s degree). Having said that, **the following paragraphs will focus on the upper secondary dual-track system** given its long tradition and global acclamation³⁶.

³² The heavy involvement of business chambers may be attributable to their historical origin in the Middle Ages, when guilds of artisans controlled the practice of their own crafts in towns and trained up newcomers. Arguably, the roles played by chambers in the modern dual-track system largely follow their predecessors.

³³ JCFIVT membership includes representatives of employers, the labour and the government. All stakeholders work closely together to ensure a large supply of workplace training places that can meet both professional standards and market needs.

³⁴ Organisation for Economic Co-operation and Development (2021), Autorengruppe Bildungsberichterstattung (2020) and Hassler (2020).

³⁵ The school-based VPET system relies more heavily on classroom teaching vis-à-vis the dual-track VPET programmes, and is mainly preparing students for community service jobs like nurses and social workers. The system accounted for 23% of students entering VPET at the upper secondary level in 2019. See Autorengruppe Bildungsberichterstattung (2020).

³⁶ It is worth noting that Switzerland also offers a similar dual-track VPET system to its youth. See Legislative Council Secretariat (2015b).

Tripartite collaboration³⁷

4.5 While VPET is open to all German youths, it usually starts at the upper secondary level, hence at the age of around 15. **On-the-job training** under dual-track VPET programmes mostly takes three years though duration would depend on subjects of study and training.³⁸ **Trainees usually work for enterprises for 3-4 days each week**, and study in public vocational schools for 1-2 days per week. **60% of classroom learning is directly related to the chosen profession** while conventional subjects (e.g. languages, mathematics and sciences) take up the remaining 40%. Upon completion of training, trainees are certified as skilled workers throughout Germany after passing the state examination executed by chambers of pertinent industries.

4.6 The involvement of enterprises in offering suitable training positions is a key ingredient of success for the dual-track VPET system. In 2020, **19% of German companies participated in the dual-track system through offering a total of 527 400 apprenticeships for new students**. An estimate of costs of such work-based training in 2018 indicated that the business sector spent an aggregate of €27.2 billion (HK\$254 billion) on such activities, translating to €1,738 (HK\$16,077) per month and per trainee.³⁹ Coupled with **the government spending of €8.5 billion (HK\$79 billion) on vocational schools**,⁴⁰ overall spending on upper secondary VPET amounted to some €35.7 billion (HK\$333 billion), equivalent to 1% of GDP that year.

4.7 The willingness of stakeholders in devoting substantial manpower and financial resources into VPET allowed the dual-track system to cover 324 occupations as at 2021. The partnership also helps ensure that skills acquired in workplace training are market-driven, broad-based and transferable across firms, as well as offering tangible benefits to the business sector. It is estimated that 70% of the training cost can be recovered through the productive work of the trainees in a year.⁴¹ In addition, occupational coverage is revised from time to time to tie in with structural changes in Germany's economy, with more openings in high-skill occupations.⁴²

³⁷ Tripartite collaboration analysed in this Note (including paragraphs 4.5 to 4.7) generally refers to the collaboration between the government, business and educational institutions. It is worth noting that when examining VPET in Germany, commentators tend more often to discuss tripartite collaboration between the government, employers/chambers of commerce, and labour unions.

³⁸ CEDEFOP (2020a) and Hassler (2020).

³⁹ Including monthly wages paid to apprentices averaging at €1,067 (HK\$9,870), which was equivalent to about 30% of the average market wage.

⁴⁰ Including vocational schools under dual-track, school-based and transition systems.

⁴¹ CEDEFOP (2020) and BIBB (2021a).

⁴² In 2018, 35% of VPET graduates aged 15-34 worked in high-skill occupations.

Impact on youth

4.8 Regarding **progression pathways**, graduates from dual-track programmes can choose to further their education and training as they wish. With expanded places at HAWs/FHs and specialized vocational schools, 24% of VPET graduates at the upper secondary level pursued higher education in 2015. Alternatively, they can proceed to further on-the-job training and become master craftsmen (i.e. Meister) through advanced vocational examinations for 94 trades.⁴³ Meister qualifications entitle them to run business, employ apprentices, take over higher positions in firms, and get access to post-secondary education in universities and HAWs/FHs. In 2014, the status of **Meister was upgraded to that of Bachelor's degree** under the German and European qualification frameworks, and subsequently renamed, in 2020, as “professional bachelor” and can lead to advancement to “professional master’s” qualifications.

4.9 VPET programmes appear to bode well for graduates’ **job seeking prospects**. In 2020, people with non-tertiary VPET qualifications had an **employment rate of 83.2%, not far away from the figure for degree holders, at 88.7%**. More specifically on dual-track programmes, the intensive workplace training not only offers trainees pragmatic work experience, but also provides their employers with ample time to observe trainees’ work performance and potential. Although employers are not obliged to hire the apprentices after the end of apprenticeship, **a government report indicated that 72% of trainees could secure jobs in the same enterprises after the end of apprenticeship in 2020.**⁴⁴ In the light of better prospects in the dual-track system, 29% of new apprentices entering the system actually gave up their university entrance qualifications to join dual-track programmes in 2017.

⁴³ Occupations covered by Meister examinations are listed in the Crafts and Trades Regulation Code.

⁴⁴ BMBF (2022).

5. VPET in Singapore

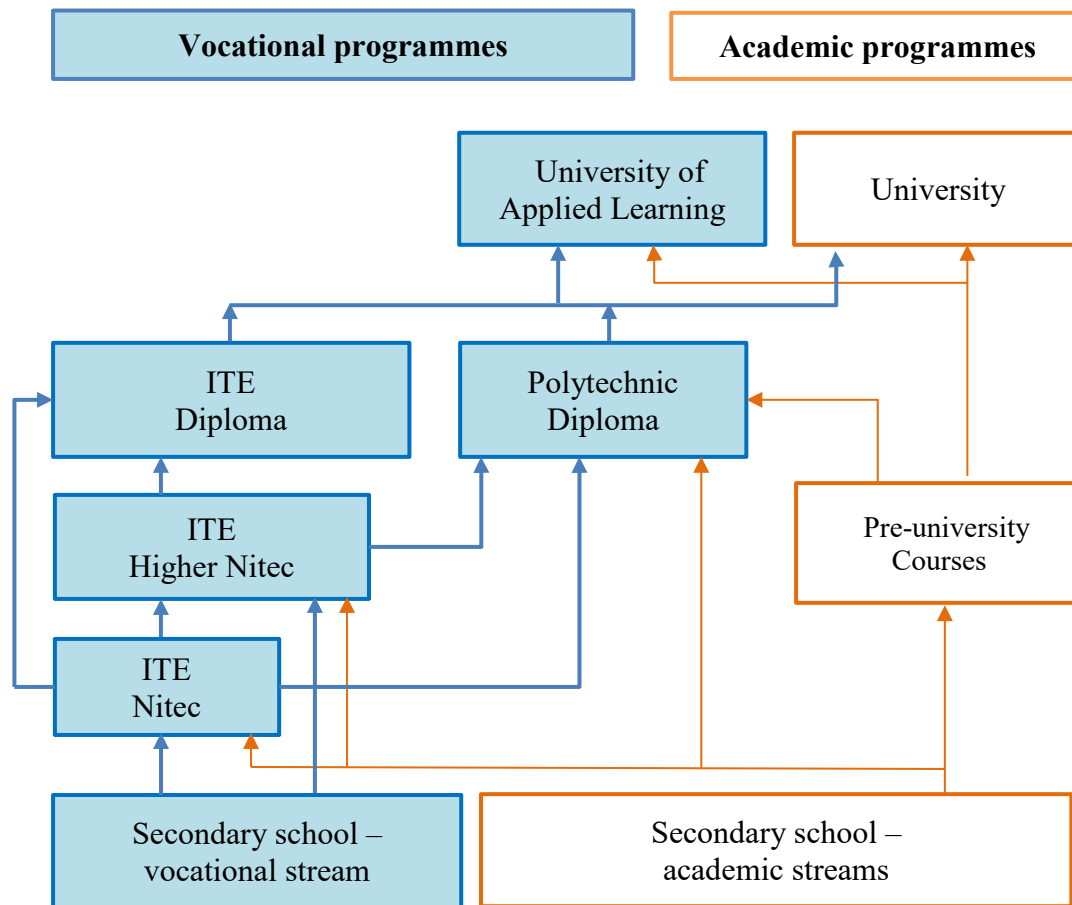
Overview

5.1 VPET in Singapore used to be seen as an inferior progression pathway, until the **Singaporean government’s radical repositioning of VPET in 1990 to support its national strategy to develop the technology industries**. Over 1990 to 2002, three more polytechnics were established on top of two existing ones, and the Institute of Technical Education (“ITE”) was set up in 1992 with a view to upgrading provision of skill training in Singapore over a wide range of disciplines (including engineering, business and healthcare). The Singaporean government is also directly involved in forward planning of VPET places, taking into account the results of projections of sectoral labour requirements conducted by the National Manpower Council and overall national development strategies. During 2010 to 2020, unemployment rate for youths aged 15-24 in Singapore averaged at 9.2%, much lower than the OECD average and slightly better than Hong Kong although still more than doubling the 3.8% for the entire labour force in Singapore.

5.2 **The education system in Singapore currently subjects students to two rounds of streaming, separately at the beginning and the end of their secondary education**. Upon entering Secondary 1, students are divided into three groups to enrol in the “express academic” curriculum, “normal academic” curriculum and technical curriculum separately (though this arrangement will end in 2024⁴⁵). All three streams of secondary education generally last for just 4 years which is noticeably shorter than 6 years in Hong Kong. **After completion of the 4-year secondary education, the vast majority of students (74% in 2020) would pursue VPET** either through ITE or the five polytechnics (accounting for 30% and 44% of the 2020 cohort respectively). The remaining school leavers would pursue the academic route in the format of pre-university Advanced Level courses lasting for two to three years (**Figure 6**).

⁴⁵ Amongst the 40 200 Singaporean Secondary 1 students in 2020, 13% of students pursued technical curriculum, taking applied subjects (e.g. computer and applied social studies) on top of core subjects (e.g. languages and mathematics). Their school-exit examination and pathways are different from those for academic streams. In response to concerns over stigma on technical stream students, Singapore’s Ministry of Education decided to abolish such streaming by 2024. In 2027, all secondary school students will sit for a single national examination after completion of Secondary 4.

Figure 6 – Education system in Singapore till 2024



Source: ITE (2018).

5.3 **VPET offered by ITE include programmes for National ITE Certificate (“Nitec”) and Higher National ITE Certificate (“Higher Nitec”),** although they will be gradually streamlined into a single three-year ITE education pathway (the first phase will start in the 2022 academic year)⁴⁶. This is the only progression route available to graduates of the technical stream in secondary education (though it is also open to students from the “express academic” and “normal academic” streams as well). **Above Nitec and Higher Nitec are Diplomas (broadly equivalent to HDs in Hong Kong), mainly offered by polytechnics with a few by ITE.**

5.4 **At the university level,** two of six public universities in Singapore (namely Singapore Institute of Technology and Singapore University of Social Sciences) were established as “**Universities of Applied Learning**” in 2009 and

⁴⁶ Students under the enhanced ITE curricular structure will go through a three-year curriculum leading directly to a Higher Nitec qualification. The first phase of implementation will start with in eight disciplines.

2017 respectively. Accounting for **17% of the overall university intake** in 2020, the two higher education institutions are generally positioned to cater to graduates of the polytechnics even though students who completed pre-university Advanced Level courses can choose to enrol as well.

Tripartite collaboration

5.5 While ITE and the polytechnics have long made their teaching setting to simulate workplace (i.e. “factory school” model), recent efforts are focused on enhancing **workplace learning/on-the-job training through compulsory internships and work-study programmes**. The polytechnics require all students to take a compulsory internship lasting for six weeks to one year. In ITE, compulsory internship with a duration of 10-20 weeks (i.e. up to five months) is required for all courses as from 2020. That will be extended to a total of nine months for the new three-year programmes.

5.6 In recent years, Singapore has been increasingly proactive in promoting work-study programmes modelled on the German dual-track system, albeit with focus on higher levels of education.⁴⁷ **For ITE and polytechnics graduates, work-study programmes** for qualifications up to the post-diploma levels have been provided to facilitate school-to-work transition since 2015. In short, graduates are matched with **suitable employers for apprenticeship for a duration of one to three years**. Apart from salaries paid by employers, **students can receive an incentive totaling S\$5,000 (HK\$28,900) from the government**. For employers, they can obtain subsidies of up to S\$15,000 (HK\$86,700) per trainee.⁴⁸ **At the university level, the “Universities of Applied Learning” offer work-study degree programmes as from 2017**, which incorporate paid traineeships. These programmes are well-received by young graduates, with altogether over 7 000 trainees benefitted in some 180 programmes by mid-2021.

5.7 Apart from offering the internships and apprenticeships as mentioned in paragraphs 5.5 to 5.6 above, **employers in Singapore are increasingly involved in curricular design, training and assessment**. The involvement of multinational corporations and market leaders (e.g. IBM and Accenture) in internship and

⁴⁷ ITE also offers Nitec or Higher Nitec traineeships with dual-track nature for secondary school leavers. However, the take-up rate of the programme was reportedly lacklustre (with just 600 trainees in 2014) because employers consider students too young to assimilate in workplace and parents prefer their children to continue to study on a full-time basis. See Today Online (2014).

⁴⁸ During September 2020 to March 2022, participating employers could receive COVID-19 support equivalent to 45%-70% of trainees’ salaries for up to a year. See SkillsFuture Singapore (2022).

apprenticeship opportunities is a distinctive edge for Singapore in grooming talents in emerging areas of artificial intelligence and cybersecurity.

5.8 There is also a **strong resource devotion from the Singaporean government to VPET, with recurrent spending on ITE and the polytechnics amounting to S\$1.6 billion (HK\$9.2 billion) in 2019-2020.** This roughly translated into S\$17,000 (HK\$76,000) per student, equivalent to 1.2 times of the corresponding figure for pre-university programmes in the academic stream.

Impact on youth

5.9 **Progression pathways** for VPET graduates have been broadened over time. Apart from establishment of the Universities of Applied Learning, traditional universities are also raising intake quotas for aptitude-based (i.e. not solely academic-based) admissions from 15% in 2017 to up to 50% from 2019 onwards, increasing the chance for students from VPET streams. As a result, **the proportion of polytechnic graduates admitted to universities rose from 20% in 2012 to 30% in 2019.**

5.10 Regarding **career prospects** for VPET graduates who choose to join the workforce, their **employment rates within six months after graduation were 83% for ITE and 90% for polytechnics** during 2015 to 2020. This is **broadly on par with that of university graduates, at 90%.** In light of the positive career prospects, **polytechnics in Singapore are able to attract students qualified for pre-university Advanced Level courses (i.e. the academic stream),** who took up 22% of the intakes in 2020.

6. Concluding remarks

6.1 In **Hong Kong**, there are more ample opportunities and more diversified pathways under VPET, following active promotion and various initiatives put in place by the Government in recent years. However, the majority of the public apparently still holds an “entrenched bias” against VPET. Commentators noted that a few issues would need to be addressed to strengthen the VPET’s role in helping the school-to-work transition of local youth, including: (a) increasing the proportion of on-the-job training in VPET programmes; (b) promoting involvement of the business sector in curriculum design and offering of on-the-job training opportunities; (c) making further financial commitment to the VPET system; and (d) providing more evidence to convince more segments of the public that the VPET pathways present unique attractiveness versus academic pathways.

6.2 In **Germany**, the dual-track system at the upper secondary level forms a significant part of its VPET system by combining school-based study with apprenticeship (for 3-4 days per week). The VPET system is backed by a legal framework for VPET, and benefits from heavy involvement of employers and business chambers in planning and implementation. As a result, one-fifth of enterprises provide apprenticeships and are willing to contribute significant financial resources to support dual-track programmes. With 72% of graduates being able to stay in the same companies where they received training, the dual-track system is deemed effective in facilitating school-to-work transition for youth.

6.3 In **Singapore**, the government has actively promoted VPET for secondary school leavers since 1990s through ITE and the polytechnics to support the national economic strategy for high-tech industries. More recently, on-the-job training and internship arrangements are being enhanced for VPET graduates. The government shows strong commitment by proactively engaging industry leaders and providing resources broadly on par with that for some academic institutions. It also enriched progression pathways for VPET students by establishing two universities dedicated to VPET and promoting non-academic/aptitude-based admissions in other universities.

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Vocational and professional education and training in selected places⁽¹⁾

| | | Hong Kong | Germany | Singapore |
|---|--|---|------------------------|---|
| A. Basic facts | | | | |
| 1. | Unemployment rate (2010-2020 average) (%) | | | |
| | – Overall | 3.5 | 4.7 | 3.8 |
| | – Youth (aged 15-24) | 10.1 | 7.5 | 9.2 |
| 2. | Employment by sector (%) | | | |
| | – Secondary sector (Manufacturing, construction and utilities) | 11.1 | 27.2 | 15.6 |
| | – Services sector | 88.8 | 71.6 | 84.4 |
| 3. | Employed persons by skill level (%) | | | |
| | – High | 40.1 | 46.4 | 59.3 |
| | – Middle | 39.5 | 44.5 | 33.4 |
| B. Recurrent government expenditure on VPET (HK\$)⁽²⁾ | | | | |
| 4. | VPET expenditure | 3 billion | 77 billion | 9 billion |
| | Share (%) in education expenditure | 3.2 | 5.8 | 13.7 |
| | Share (%) in GDP | 0.1 | 0.3 | 0.3 |
| 5. | Expenditure per student (rounded to the nearest thousand) | | | |
| | – VPET | 60,000 | 146,000 ⁽³⁾ | 97,000 |
| | – Comparable academic level ⁽⁴⁾ | 91,000 | 108,000 ⁽³⁾ | 79,000 |
| C. VPET system | | | | |
| 6. | VPET participation rate (%) | | | |
| | – Upper secondary | 14 | 48 | 27 ⁽⁵⁾ |
| | – Post-secondary ⁽⁶⁾ | 33 | 39 | 53 ⁽⁷⁾ |
| 7. | Dual-track programmes | Emerging | Developed | Emerging |
| 8. | Period of compulsory workplace learning in selected post-secondary programmes | ≥90 hours (VTC's Higher Diplomas) | Not applicable | 6 weeks-1 year (Polytechnic Diplomas) |
| 9. | Pathway to universities | ✓ | ✓ | ✓ |
| 10. | Dedicated Universities of Applied Sciences | ✗ | ✓ | ✓ |
| | – Share (%) in university enrolment | Not applicable | 35% | 13% |
| 11. | Business engagement | Limited | Broad | Moderate |

Notes: (1) Data in 2019 unless otherwise specified.

(2) Referring to expenditure on (a) Vocational Training Council in Hong Kong, (b) upper secondary vocational schools in Germany, and (c) Institute of Technical Education (“ITE”) and polytechnics in Singapore.

(3) Figures in 2018, including private expenditure.

(4) Referring to (a) secondary level in Hong Kong and (b) upper secondary level in Germany, and (c) pre-university Advanced Level in Singapore.

(5) Share (%) of students in Secondary 3 and above, pre-university courses and ITE.

(6) Including sub-degree and degree levels. Caution should be taken as definition of post-secondary VPET varies widely across places.

(7) Share (%) of students in polytechnics, universities and other tertiary institutions.

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Note: ^ Internet resources listed in this section were accessed in June 2022.