**For discussion
on 11 November 2013**

Legislative Council Panel on Education

**Vocational Training Council's
Proposed Enhancement of Information Technology
Infrastructure and Services
and Longitudinal Study on Students**

PURPOSE

       This paper seeks Members' views on the proposals for the Vocational Training Council (VTC) to –

    (a)   enhance its information technology (IT) infrastructure and services; and

    (b)   conduct a longitudinal study on the Hong Kong Diploma of Secondary Education (HKDSE) graduates who opt to pursue vocational education and training (VET) post-secondary programmes in VTC.

PROPOSALS

(A) Enhancement of IT Infrastructure and Services

Justifications

2.   The Finance Committee last approved in March 2000 a commitment of $176.9 million for major enhancement of VTC's IT infrastructure and services. As a result of the enhancement, VTC has, among other things, launched a web-based teaching learning service, introduced an e-mail system for all staff and students, installed additional personal computers and supporting equipment, and provided better integration and connectivity to campus networks to support its management systems and administrative functions.

3.   In view of the technological advancement since the last major enhancement in 2000 and to cope with the ever increasing demand for more diverse, better and faster IT services to support learning and teaching, new IT systems have to be introduced for the benefit of its 250 000 students and

7 000 staff. The IT infrastructure and equipment also have to be replaced, upgraded or enhanced. Major areas requiring attention are –

(a)   the increasing demand in terms of both volume and speed for mobile access to support learning and teaching for post-secondary and vocational training programmes, in particular e-learning and various online services;

(b)   new IT systems to support the introduction of new curriculum structures which require continuous development and support; and

(c)   enhancement of IT security in view of increasing risks of cyber attack and unauthorised access.

The proposed IT enhancement will address the above areas. Details of the proposal are provided below.

Mobile Access and Applications

4.   To capitalise on the extensive use of mobile devices by the new generation of students, VTC proposes to enhance the support to e-learning through better access to VTC's internal network by mobile devices by –

(a)   enhancing access by mobile devices to IT services (e-learning and student self-services) at 17 campuses of the Institutes of Vocational Education (IVE) and Youth College (YC) by installing additional advanced servers, providing Wi-Fi access points with latest access protocol (802.11ac) with up to 1GB of transfer speed and associated ultra-high bandwidth network equipment; and

(b)   developing and introducing free mobile apps and new mobile-based IT services for applicants, students and staff.

The above will help provide more flexible and versatile learning and teaching as well as better student support services.

Support for New Curriculum Structure

5.   In the spirit of promoting flexible and diverse pathways with multiple entry and exit points, VTC has introduced a flexible module-accumulation curriculum structure for its various programmes to tie in with the introduction of the new senior secondary curriculum and the new cohorts of HKDSE graduates since the 2012/13 academic year.   The credit-based module-accumulation curriculum allows students choices of modules and

pace in their studies and allows for more flexibility in learning. The migration to this new curriculum structure entails tremendous IT support. To pave way for the early introduction of this flexible curriculum for the benefit of students, VTC has made necessary adaptations and basic enhancement to its existing IT infrastructure to the extent possible. However, these adaptations only provide the primary core functions to meet the basic requirements. To support and sustain its smooth operation, VTC must upgrade its IT systems to integrate various services, including student admission and registration, timetabling and module selection services, student data management services across different modules, etc. VTC has to ensure sufficient room for future enhancements to the systems as and when the module-accumulation curriculum structure requires refinements and adjustments.

6.   To promote the employability of students, career guidance and support is an indispensable element in the provision of vocational education and training. VTC has strengthened career development and advisory services for students and introduced new IT services to disseminate information about jobs, progression pathways and career development. Development and enhancements of these systems are also required.

Information Security and Software Asset Management

7.   There are increasing threats of hacking activities aimed at public bodies and large enterprises. VTC needs to stay vigilant of the security risk and put in place effective information security controls and safeguard measures for our information systems. To ensure adequate protection to counter information security attacks, VTC will implement enhancement covering the following areas of work –

   (a)   enhance the network infrastructure including the upgrading of firewalls, intrusion detection and prevention systems, and the introduction of new real-time analysis and monitoring system to identify attacks;

   (b)   enhance and improve the confidentiality, reliability and integrity of the Staff and Student Email Systems for over 70 000 mail accounts;

   (c)   enhance the functionalities of the Computer and Network Account System for all students and staff to facilitate the unique user identity (role-based) resources provisioning and access authorization, and to improve the security of the users' identity matching process and the management of user groups; and

(d)   enhance the Software Asset Management System, which helps monitoring and minimising the risks of the use of illegal software, as well as reducing the chance of over-procurement of software license.

8.   VTC proposes to carry out the enhancement of IT infrastructure and services from 2014 to 2018 with detailed implementation plan at **Annex**.

(B) Longitudinal Study on HKDSE Graduates

Justifications

9.   2012 was a landmark year in the history of education in Hong Kong, when the first cohort of students completed the New Senior Secondary (NSS) Education under the New Academic Structure (NAS) and proceeded, through multiple pathways, to further studies, training and employment. As the largest VET provider in Hong Kong offering pathways for HKDSE graduates, VTC proposes to conduct a longitudinal study on the HKDSE graduates who have joined VTC's post-secondary programmes with a view to enhancing the VET services for the new generation of secondary school leavers.

10.   Unlike the daily monitoring of students' performance, the proposed longitudinal study is a special exercise to study the profiles and characteristics of HKDSE graduates who have joined VTC and track their development through VET post-secondary programmes. The study will be conducted among two cohorts of VTC's post-secondary programmes (degree students admitted in the 2013/14 and 2015/16 academic years and higher diploma students admitted in the 2013/14 and 2014/15 academic years), with a view to keeping track of, and comparing and contrasting, the development of these two cohorts in terms of their engagement in various development programmes, experience and development throughout their entire duration of study. The results of the study will be finalised in the 2019/20 academic year after relevant cohorts of students complete their studies no later than 2018/19 academic year.

11.   The findings and analysis will enable VTC to improve pedagogical and curriculum design, student counseling and campus life enhancement programmes on an informed basis for the benefit of all future cohorts of VET programmes. More importantly, the study will complement efforts made by other education sectors in evaluating the effectiveness of the

curriculum, pedagogy and support services to cater for learners' needs, interest, capabilities and diversity as well as the need of the wider community.

Scope of study

12.　　　　Quantitative and qualitative data will be gathered from about 2 500 students, including 2 000 students randomly sampled from VTC's higher diploma programmes (equivalent to around 15% of total number of student intake to VTC's higher diploma programmes in the 2013/14 academic year), and all students from VTC's degree programme (around 500). Participation in the study is voluntary. Measures will be taken to encourage participation and minimise attrition over time. The study will involve –

- (a)　collection of information on students' background and personal characteristics;

- (b)　investigation of students' development through VET programmes in terms of academic achievements and personal growth, their engagement in various development programmes, level of participation in on-campus activities and attainment of attributes expected of graduates over time;

- (c)　exploring the level of personal resources (such as personal resilience, capacity to cope with stress and adverse events, etc.) students possess; and

- (d)　examination of the contributing factors of students' development.

13.　　　　A combination of quantitative and qualitative research methods will be employed. The quantitative stage will be administered through annual surveys using self-completion questionnaires. Follow-up qualitative focus group discussions will be conducted among a selected group of students to obtain more in-depth data to deepen understanding of issues identified in the surveys. The use of this mixed method also provides a check on the accuracy of each other.

FINANCIAL IMPLCATIONS

(A) Enhancement of IT Infrastructure and Services

14.　　　　The proposal will incur a non-recurrent expenditure of $67.218 million. VTC estimates that the enhanced IT facilities will give rise to an additional recurrent expenditure of $10.1 million upon full implementation for

maintenance and operation. VTC will absorb the recurrent cost within its existing resources.

(B) Longitudinal Study of DSE Graduates

15.　　　A research team will be formed to conduct the longitudinal study with 5 full-time staff led by a project consultant working on a part-time basis. Funding of $19.48 million for the period from the 2014-15 to 2019-20 financial year will be required to cover –

(a)　staff costs of the research team ($19.14 million for the said period), including a part-time Project Consultant ($1.8 million), a Project Manager ($6 million), three Research Fellows ($10.2 million) and one Executive Assistant ($1.14 million); and

(b)　initial office set-up and daily operations, including office equipment, consumables and general administration as well as research software tools for quantitative and qualitative analysis ($0.34 million).

WAY FORWARD

16.　　　Subject to Members' views on the proposals, we plan to seek funding approval from the Finance Committee in December 2013.

Education Bureau
November 2013

**Implementation Plan for VTC's Proposed Enhancement of
IT Infrastructure and Services from 2014 to 2018**

	Start	End
IT Programme		
(i) Mobile Access and Applications		
Smart Campus	Q1 2014	Q4 2015
Mobile Applications	Q2 2014	Q1 2018
(ii) Support for New Curriculum Structure		
IT Service Development on Student Admission	Q2 2014	Q1 2018
IT Service Development on Timetabling and Module Selection	Q2 2014	Q1 2018
IT Service Development on Student Records Management	Q2 2014	Q1 2018
Lifelong ID for VTC Clients	Q2 2014	Q1 2018
Enhancements of Student Portal	Q2 2014	Q1 2018
IT Service Enhancements on Holistic Programme Planning	Q2 2014	Q1 2018
IT Service Development on Career Development and Advisory	Q2 2014	Q1 2018
(iii) Information Security and Software Asset Management		
Secure Network Infrastructure	Q2 2014	Q1 2018
Enhancements of Email Services	Q2 2014	Q1 2018
Enhancements on Information Security Technologies	Q1 2014	Q1 2018
Enhancements of Computer and Network Accounts System	Q2 2014	Q3 2017
Software Asset Management	Q2 2014	Q4 2017
Infrastructure to support the projects		
Enterprise Server Upgrade and Virtualization	Q1 2014	Q1 2018