For discussion
on 11 March 2019

Legislative Council Panel
on Information Technology and Broadcasting

IT Innovation Lab in Secondary Schools

Purpose

       This paper seeks Members' support for the proposal announced in the 2019-20 Budget Speech to provide funding support for all publicly-funded secondary schools to set up Information Technology ("IT") Innovation Labs, and for submission of the funding proposal to the Finance Committee of the Legislative Council.

Background

2.   According to the 2018 Manpower Survey Report for Innovation and Technology Sector published by the Vocational Training Council, there were around 95 780 IT practitioners in Hong Kong.   Although the number of IT practitioners increased by 9.1% from 2016 to 2018, the report projected that the market would still need around 2 490 IT degree and 1 858 IT sub-degree graduates annually between 2019 and 2022 to join the IT industry.

3.   The Office of the Government Chief Information Officer ("OGCIO") launched the eight-year Enriched IT Programme in Secondary Schools ("EITP") in the 2015/16 school year to identify and nurture IT talents in secondary schools vis-a-vis the development of our digital society.   EITP is composed of two components :

(a)   <u>Enriched IT Class Programme</u> – to provide funding support for eight partner schools to operate enriched IT classes to provide advanced IT training to students who are interested and talented in IT.   Each partner school receives a sum of $250,000 per class per year; and

(b)   Enriched IT Activities Programme – to provide funding support for secondary schools to organise various types of IT activities to create more opportunities for students to learn about IT beyond the school curriculum with an aim to foster an IT learning atmosphere among the school community and cultivate students' interest in IT. The maximum funding for each application is $50,000.

4.   EITP is in its fourth year of operation.   At present, the enriched IT classes at the eight partner schools have about 1 000 students.   In addition, the programme provided funding to 142 secondary schools to organise different types of IT activities in the past few years, with about 20 000 student participants.   As at end-2018, the programme's total expenditure was about $37 million.

5.   OGCIO conducted an interim review on EITP in the second half of 2018, and consulted various stakeholders, including teachers, students and their parents who had participated in the programme, secondary school councils, tertiary institutions, the IT industry and IT-education related associations. Overall, the stakeholders agreed that organising different types of IT activities outside the school curriculum helped arouse students' interest in IT learning and cultivate their creativity and logical thinking.   Many of them expressed that such support should be extended to more schools so as to further strengthen and promote popular IT learning and benefit all secondary schools.

Proposal

6.   Strengthening popular science education and "Science, Technology, Engineering and Mathematics" (STEM) education are among the eight major areas to develop Innovation and Technology ("I&T") announced by the Chief Executive in her 2017 Policy Address.   In this Internet-driven digital era, IT is an important pillar of I&T development, as well as economic progression and improvement in daily living.   With the wide adoption of IT across different areas and sectors, the demand for IT talent in various industries is constantly on the rise.   We must step up efforts to nurture young people's interest in IT and innovative thinking by fostering an IT learning atmosphere, and encourage them to enrol in technology related post-secondary programmes

and pursue a future career in I&T. Therefore, the Financial Secretary proposed in his 2019-20 Budget to set aside $500 million to implement the "IT Innovation Lab in Secondary Schools" initiative in all publicly-funded secondary schools in the coming three school years, with an aim to have laid a sound foundation in IT for young people in their secondary education and further solidify the supply of local IT and I&T talent in the long run.

7.   As a new initiative under the existing EITP, we propose to provide a maximum funding support of $1 million in the three school years from 2019/20 to 2021/22 to each publicly-funded secondary school to set up IT Innovation Lab to enhance IT equipment and facilities at schools and organise more IT-related extra-curricular activities ("ECA") outside traditional classroom learning.   The ECA will focus on inspiring students to make use of computer science principles, learning about emerging technologies (such as artificial intelligence (AI), blockchain, cloud computing, big data, etc.), and even developing innovative trial solutions to address problems in learning, working and daily living (such as city management, traffic, health, elderly care, etc.) to further promote the development of popular science education.

8.   Each participating secondary school will receive a maximum funding of $1 million for use in the following areas:

(a)   setting up an IT Innovation Lab through procuring and upgrading IT equipment and infrastructure (such as server-side and client-side hardware and software, optical fibre and broadband network, cloud servers and storage services, etc. for students' use in learning IT subjects) according to the needs of the school and its students, and acquiring related professional services (such as cloud services); and

(b)   organising IT-related ECA such as coding classes, mobile app workshops, virtual reality ("VR") / augmented reality ("AR") workshops, seminars on application of IT and digital transformation, out-of-classroom experiments or short courses (on topics such as AI application, drone coding and robotics coding); organising intra- and inter-school IT activities (such as visits to local offices of multinational companies and local start-ups, joint-

school coding competitions); preparing for and participating in local and international competitions (such as datathons); and organising IT exhibitions to showcase students' work or deliverables. The funding can also be used to meet the operational expenses for supporting the IT Innovation Lab and related activities (such as maintenance and professional services for learning support) as well as other related expenses (such as administrative support, accounting and audit).

9.　　　OGCIO will set up a one-stop professional support centre, provide relevant guidelines and a reference list of equipment; coordinate with the IT industry; and provide professional advice and technical support to schools in setting up IT Innovation Lab, procuring related equipment, infrastructure and professional services, and organising ECA on various topics (see examples of lab equipment at **Annex**). We will streamline the application and approval procedures as far as possible and disburse the funding each year in accordance with the annual proposals submitted by schools. OGCIO will organise sessions to brief for schools and teachers on details of the new initiative. In addition, OGCIO will set up an advisory committee with representatives from the IT industry, academia and education sector to advise on the reference list of equipment for schools as well as the nature and types of the IT-related ECA to be organised. The committee will also advise the Government on the implementation progress and vetting criteria for applications received under the initiative.

10.　　　Subject to the Finance Committee's approval of funding, we plan to officially launch the "IT Innovation Lab in Secondary Schools" initiative before end-2019 and invite about 500 publicly-funded secondary schools to join the initiative on a voluntary basis. The new initiative will support all publicly-funded secondary schools to organise IT-related ECA in a more flexible manner, and will replace the Enriched IT Activities Programme mentioned in paragraph 3(b) above.

Financial Implications

11.   We propose to increase the general non-recurrent allocation by $500 million to implement the "IT Innovation Lab in Secondary Schools" initiative.   If supported by Members, we will submit the funding proposal to the Finance Committee in the second quarter of 2019.

12.   Furthermore, we estimate that the time-limited recurrent expenditure arising from implementing this initiative is $11.6 million per annum, mainly for the staff and operating costs of programme management, funding scheme administration, advisory committee secretariat, one-stop professional support centre, etc.   OGCIO will set aside sufficient funds in its budget estimates in the relevant financial years to meet the aforementioned expenditures.

Advice Sought

13.   Members are invited to support the proposed "IT Innovation Lab in Secondary Schools" initiative mentioned above.

Office of the Government Chief Information Officer
Innovation and Technology Bureau
March 2019

IT Innovation Lab in Secondary Schools

Reference List of Lab Equipment

	Equipment / Apparatus	Purpose
1.	Laboratory equipment such as optical fibre and broadband network, cloud servers, storage services and related cloud-based coding and data analytics tools, etc.	Supporting the IT-related ECA
2.	Laptop computers, tablet computers, smartphones, coding tools, etc.	Organising coding classes, and participating in workshops and competitions for coding and prototyping
3.	AI learning such as pattern and object recognition kits, voice recognition kits, machine learning tools, etc.	Developing AI prototype solutions with machine learning tools
4.	Data analytics tools, data visualisation tools, etc.	Organising activities on data analytics, data visualisation and programming
5.	Drones	Organising drone coding activities, and workshops and competitions for producing VR scenes
6.	Programmable robotics kits, sensors, programmable controllers, etc.	Organising robotics assembling activities and robotics control through programming
7.	VR/AR devices	Organising workshops and competitions for producing VR/AR prototypes