

ITEM FOR FINANCE COMMITTEE

**HEAD 47 – GOVERNMENT SECRETARIAT :
OFFICE OF THE GOVERNMENT CHIEF INFORMATION
OFFICER**

Subhead – 700 General non-recurrent

Item 894 – “Enriched IT Programme in Secondary Schools”

Members are invited to approve an increase in the approved commitment of Subhead 700 General non-recurrent Item 894 “Enriched IT Programme in Secondary Schools” from \$75 million by \$500 million to \$575 million for implementing the “IT Innovation Lab in Secondary Schools” initiative under the existing “Enriched IT Programme in Secondary Schools”.

PROBLEM

Information technology (IT) is an important pillar in promoting innovation and technology (I&T) development in different areas, and the demand for IT talent in Hong Kong and other places is on the rise. We need to cultivate secondary school students’ interest in IT, enhance their digital skills, computational thinking and innovative abilities at the early stage to inject new blood in research and development and industry development for the local IT and other technology areas.

PROPOSAL

2. The Government Chief Information Officer, with the support of the Secretary for Innovation and Technology, proposes to implement the “IT Innovation Lab in Secondary Schools” (IT Innovation Lab) initiative under the

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existing “Enriched IT Programme in Secondary Schools” (EITP) to provide funding support of up to \$1 million in the three school years from 2020/21 to 2022/23 for each publicly funded secondary school¹ to upgrade their IT equipment and facilities and organise IT-related extra-curricular activities (ECA).

JUSTIFICATION

3. Strengthening popular science education and “Science, Technology, Engineering and Mathematics” (STEM) education are among the eight major areas to promote I&T development put forth by the Chief Executive in her 2017 Policy Address². In this Internet-driven digital age, IT is a common technology in I&T development. With the wide adoption of IT across different areas and sectors, the demand for IT talent in various industries is strong and ever-increasing. We must enhance the interest of young people (including secondary school students) in IT and innovative thinking and foster an IT learning atmosphere to encourage them to choose technology-related tertiary education programmes and pursue an I&T career in the future.

4. The Office of the Government Chief Information Officer (OGCIO) conducted an interim review on EITP in the second half of 2018, and consulted stakeholders including teachers, students and their parents of the participating schools, secondary school councils, tertiary institutions, the IT industry and IT-education related associations. The stakeholders generally agreed that students’ participation in IT activities outside classroom learning helped arouse their interest in learning IT and cultivate their creativity and logical thinking. They generally hoped that the programme could be extended to all schools in order to strengthen and promote popular IT education.

5. Having regard to this, the Financial Secretary in his 2019-20 Budget Speech proposed the provision of \$500 million to implement the “IT Innovation Lab” initiative in all publicly funded secondary schools in Hong Kong in the coming three school years, with the aim to lay a sound foundation in IT for young people during their secondary schooling, thereby promoting local popular science education and expanding the supply of I&T talent.

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¹ Including government, aided (including special schools), caput secondary schools and secondary schools under the Direct Subsidy Scheme.

² The eight major areas include increasing resources for research and development; pooling together technology talent; providing investment funding; providing technological research infrastructure; reviewing existing legislation and regulations; opening up government data; Government to lead changes to procurement arrangements; and popular science education.

“IT INNOVATION LAB” INITIATIVE

6. The funding scope of the “IT Innovation Lab” initiative includes the following two aspects –

- (a) procuring and maintaining IT equipment and infrastructure (such as server-side and client-side hardware and software, optical fibre and broadband network, cloud servers and storage services) and acquiring relevant professional services (such as cloud services) that meet the needs of the school and its students; and
- (b) organising IT-related ECA. These activities can take different forms, including workshops, seminars, short courses, visits, experience activities, as well as participation in local and international competitions and organising exhibitions to showcase students’ innovation and achievements. The scope of such activities can also be wide-ranging, including for example learning to code, learning about new technologies such as virtual reality/augmented reality, artificial intelligence (AI), drones, robotics, etc., the application of IT, digital transformation, visits to multi-national companies in Hong Kong and local start-ups as well as preparing for IT competitions, such as datathons, etc. The funding could also cover operational expenses of these activities (such as maintenance and professional services for learning support) and administrative cost.

7. In order to assist schools in procuring and organising suitable ECA, OGCI O has set up a one-stop support centre to provide schools with professional advice and support. OGCI O will provide a reference list of IT equipment (reference examples of equipment are at Enclosure 1) and issue application guidelines. OGCI O will streamline the application and approval procedures as far as possible and disburse the funding to successful applicants each year in accordance with the annual plans submitted by schools.

Encl. 1

8. OGCI O will mobilise the industry, relevant organisations (including Hong Kong Science Park, Cyberport, Hong Kong Productivity Council) and educational bodies to support the initiative by providing learning opportunities such as seminars, workshops, exhibitions, IT experience activities, etc. so as to enable students to keep abreast of new technologies and the latest development in the IT industry. OGCI O has also explored with the industry concessionary arrangements for school-editions of their hardware, software, cloud services and tools, etc. and encouraged schools to participate in joint-school sharing.

9. The “IT Innovation Lab” initiative will adopt a more flexible and comprehensive approach to provide funding support to all publicly funded secondary schools to organise IT-related ECA. It will also replace the “Enriched IT Activities Programme” under the existing EITP. The eight partner schools currently under the “Enriched IT Class Programme” can choose to join the new “IT Innovation Lab” initiative.

GOVERNANCE AND MONITORING

10. OGCIO will set up an advisory committee to be chaired by the Government Chief Information Officer for the initiative. Members will include experts from the IT industry, academia and education sector. The committee will provide advice and recommendations in several major aspects, including the reference list of equipment, the nature and types of IT-related ECA, implementation progress and vetting criteria.

11. In addition, in applying for funding, schools are required to submit an annual plan on how the procured IT equipment and professional services will be utilised to organise suitable ECA. A vetting committee comprising experts from both the education and IT sectors will be set up to consider the applications and make funding recommendations to OGCIO to ensure the approved funding will be used in line with the policy objectives and funding scope of the initiative. OGCIO will publish the broad vetting criteria and pre-approved activity types for reference by schools. To provide schools with greater flexibility, the approved funding will be disbursed to schools accordingly each year. In terms of monitoring and control, schools are required to submit an annual report on the expenditure and uses of the procured equipment and services against their annual plan to ensure the funding is properly spent. In the event of any non-compliance with these requirements by the schools, OGCIO will take appropriate measures to assist schools in rectifying them and, if necessary, consider withholding or terminating funding disbursement to the schools concerned. OGCIO will monitor the implementation of this initiative and assess the effectiveness in light of technology development, school needs and other relevant funding measures, etc. as appropriate.

FINANCIAL IMPLICATIONS

12. A non-recurrent commitment of about \$500 million is required to provide funding to all publicly funded secondary schools in Hong Kong to implement the “IT Innovation Lab” initiative in three school years starting from 2020/21. The indicative breakdown and cashflow by financial year are as follows –

/2020-21

	(\$ million)				
	2020-21	2021-22	2022-23	2023-24	Total
(a) Schools to procure IT equipment and services	80	110	60	0	250
(b) Schools to organise ECA and related expenses for IT Innovation Lab	20	80	100	50	250
Total:	100	190	160	50	500
				Total:	500

13. Schools can join the initiative on a voluntary basis and apply for as well as use the funding flexibly according to their own circumstances and needs in the areas mentioned in paragraphs 6(a) and (b) above. The total and annual expenditures in paragraphs 12(a) and (b) above may hence vary depending on the actual applications submitted by schools.

14. OGCI estimates that the time-limited recurrent expenditure for implementing the initiative is \$11.6 million per annum, mainly for the staff and operating costs of programme management, funding scheme administration, secretariat support for the advisory committee, and operation of the one-stop support centre, etc. OGCI has included the necessary provision for 2020-21 in the Estimates and will make similar arrangements for the relevant subsequent financial years.

IMPLEMENTATION PLAN

15. In the past year or so, OGCI has been conducting related preparatory work in order to launch the initiative as soon as possible. Such preparatory work is now mostly completed. Subject to the funding approval of Finance Committee (FC), we plan to implement the “IT Innovation Lab” initiative in the 2020/21 academic year and invite applications from the publicly funded secondary schools in the fourth quarter of 2020.

/PUBLIC

PUBLIC CONSULTATION

16. On 11 March 2019, we consulted the Panel on Information Technology and Broadcasting of the Legislative Council (LegCo) on the initiative. Members generally supported our submission of the funding proposal to FC. Individual members requested extension of the “IT Innovation Lab” initiative to all primary schools in Hong Kong. After consulting the relevant bureaux/departments and making reference to the implementation experience of the existing EITP, we are of the view that students generally explore their direction in further studies and career during secondary schooling. Therefore, providing funding support to schools to enable secondary school students to experience new technologies such as AI, big data, etc. is more in line with the Government’s policy objective to nurture technology talent. In addition, certain Members requested that the Education Bureau (EDB) send representatives to attend the FC meeting to answer questions relating to education policies. EDB considers that the Innovation and Technology Bureau champions the “IT Innovation Lab” initiative, which is a time-limited Budget initiative, and OGCIO will implement it, including providing interested schools with the necessary professional support and advice. EDB will brief Members separately on the promotion of STEM education in the Panel on Education.

17. We consulted the Youth Development Commission and secondary school councils/associations of school principals on 22 March and 4 April 2019 respectively. The proposal received overall support. Some representatives of the secondary school councils and associations of school principals hoped that the application and approval procedures would be streamlined and that the use of funding could be more flexible so that schools could organise learning activities, co-curricular activities and ECA that aligned with their school-based curriculum. We will take the schools’ views into full consideration in mapping out the relevant implementation details.

18. Through seminars organised by the IT industry and teacher-related associations, we briefed about 600 teachers in April and May 2019 of the initiative. A few LegCo members visited a secondary school participating in the “Enriched IT Activities Programme”, one of the components under EITP as mentioned in paragraph 20(b) below, on 2 May 2019 to understand school-based IT learning through IT-related ECA. We also conducted three briefing sessions on the initiative in June and July 2019 for more than 610 principals and teachers from 360 secondary schools and shared success stories of schools organising IT-related ECA. We exchanged views on the initiative with representatives from the academia, secondary schools and the IT industry in July 2019, and briefed the Committee on Innovation, Technology and Re-industrialisation in September 2019.

The initiative received general support. Recently, a number of secondary schools councils and school principals associations have written to OGCIO, urging for an early launch of the initiative so that they can make use of the funding to set up their IT innovation lab and organise IT activities which they have planned for some time.

BACKGROUND

19. 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.

Encl. 2 20. OGCIO launched the eight-year EITP (examples and deliverables of activities are at Enclosure 2) in the 2015/16 school year to start identifying and nurturing IT talent in secondary schools vis-à-vis the development of our digital society. EITP is composed of two components –

- (a) *Enriched IT Class Programme* – 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 outside classroom learning with an aim to foster an IT learning atmosphere in the campus and cultivate students' interest in IT. The maximum funding for each application is \$50,000.

21. EITP is in its fifth year of operation. The enriched IT classes in the eight partner schools have about 1 000 students. In addition, about 20 000 students participated in the IT activities organised by 142 secondary schools. As at the end of 2019-20 financial year, the total expenditure of the programme was about \$50 million.

IT Innovation Lab in Secondary Schools
Reference List of IT Equipment

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

**Examples and Deliverables of
“Enriched IT Activities Programme”**

	Technology Application	Activity	Deliverables
1.	Mobile Apps	Mobile apps development courses and group presentations	<ul style="list-style-type: none"> • Students learned basic interface control of visual programming languages, application of sensors and control of apps.
2.	Robotics Control	Robotics courses and exchange programmes	<ul style="list-style-type: none"> • Students constructed and programmed robotics and completed simple tasks by using sensors.
3.	Virtual reality (VR)/Augmented reality (AR)	VR/AR courses	<ul style="list-style-type: none"> • Students enhanced the learning experiences of various subjects using VR/AR, making learning more interesting. • Students used computer programming languages to develop VR/AR mobile apps and showcased them during school activities.
4.	Smart Home	Training Course for Smart Home Maker	<ul style="list-style-type: none"> • Students grasped the concept, design and development related to smart home, and showcased their learning deliverables in competitions or exhibitions.
5.	Internet of Things	Short workshops for Internet of Things and smart home	<ul style="list-style-type: none"> • Students grasped the concept of automated control, and learned about Internet of Things and its applications in daily life through short workshops.
