CHAPTER 7

Education Bureau

Education Bureau's efforts in harnessing information technology to facilitate learning and teaching

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EDUCATION BUREAU'S EFFORTS IN HARNESSING INFORMATION TECHNOLOGY TO FACILITATE LEARNING AND TEACHING

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EDUCATION BUREAU'S EFFORTS IN HARNESSING INFORMATION TECHNOLOGY TO FACILITATE LEARNING AND TEACHING

Executive Summary

1. In line with the global trend of harnessing Information Technology (IT) to facilitate learning and teaching, the Education Bureau (EDB) has implemented various strategies on IT in education and other e-learning initiatives since 1998/99 school year (unless stated otherwise, all years mentioned hereinafter refer to school years). In November 1998, the EDB published the First Strategy on IT in Education (ITE1), and issued the Second and Third Strategies on IT in Education (ITE2 and ITE3) in 2003/04 and 2007/08 respectively. According to the EDB, ITE1 to ITE3 laid a solid foundation in areas such as the provision of basic IT infrastructure and learning resources, and enhancement of teachers' professional capacity and student learning.

2. In 2015/16, the EDB launched the Fourth Strategy on IT in Education (ITE4). According to the EDB, the goal of ITE4 is to unleash the learning power of students to learn to learn and to excel through realising the potential of IT in enhancing interactive learning and teaching experience. The main initiatives under ITE4 include: (a) WiFi-900 Scheme aiming to enable schools to acquire mobile computing devices to tie in with their acquisition of WiFi services covering all classrooms; and (b) a one-off grant to the Hong Kong Education City Limited (HKECL) for enriching e-learning resources. As at 31 March 2018, the actual expenditure on the implementation of ITE4 was $99.5 million.

3. In addition to ITE1 to ITE4, the EDB has taken other measures to harness IT to facilitate learning and teaching, including: (a) the Composite Information Technology Grant (CITG) provided to all public sector schools (i.e. government schools, aided schools, caput schools and special schools) as a source of ongoing funding to meet their operational needs for IT in education; (b) professional development activities for education professionals to enhance their knowledge and skills to promote e-learning; (c) an education portal operated by the HKECL; (d) some IT related one-off projects funded by the Quality Education Fund to promote quality

education in schools; (e) a three-year Pilot Scheme on E-Learning in Schools to tap into the changing pedagogical practices and pave the way for wider adoption of e-learning in schools; (f) E-textbook Market Development Scheme to facilitate the development of e-textbooks in line with the local school curricula; and (g) the Scheme for Supporting Schools to Adopt E-textbooks. In financial year 2016-17, the actual expenditure of the recurrent measures in items (a) to (c) was about $390 million. In 2016/17, the actual expenditure of the recurrent measure in item (d) was about $50 million. As at 31 March 2018, the actual expenditure of the non-recurrent measures (items (e) to (g)) was about $150 million.

4. The IT in Education Section of the EDB is responsible for the formulation, implementation and monitoring of e-learning initiatives for enhancing learning and teaching effectiveness in primary and secondary education, including the provision of funding and other professional support to the schools. The Audit Commission (Audit) has recently conducted a review of the EDB's efforts in harnessing IT to facilitate learning and teaching.

Provision of resources to schools

5. ***Need to provide further assistance to schools.*** The WiFi-100 Scheme was launched in 2014 as a pioneer measure to provide funding to 100 public sector schools and local schools under Direct Subsidy Scheme (DSS) for setting up the necessary WiFi environment. As an extension to the WiFi-100 Scheme, the WiFi-900 Scheme was launched in 2015 to set up WiFi infrastructure by phases from 2015/16 to 2017/18 for the public sector schools and DSS schools not covered in the WiFi-100 Scheme. The EDB required the schools that intended to participate in the WiFi-900 Scheme to submit an Expression of Interest (EOI) to indicate their tentative e-learning implementation plan and their preference of the time to complete the WiFi enhancement. After reviewing the EOIs submitted by schools, the EDB found that among the 887 schools under the WiFi-900 Scheme, 334 (38%) were considered less ready to implement e-learning in terms of their teachers' readiness and engagement of stakeholders. The EDB provided funding to the 334 schools after obtaining their written confirmations committing to make improvement in these two aspects as the condition for receiving the funding. At the end of 2016/17, 224 (67%) of the 334 schools had enhanced their WiFi infrastructure. Audit examined the results of the annual school survey conducted by the EDB for 2016/17 and noted that: (a) information regarding stakeholders' engagement was not sought in the survey; and (b) of the 224 schools, 47 did not respond to the survey or did not provide information on their readiness in teacher development in their responses, and 88 considered

themselves less than ready or not ready in the teacher development for integrating e-learning into their school curricula (paras. 2.3, 2.5, 2.7 to 2.9 and 2.11).

6. ***Need to continue to promote the usage of e-textbooks and e-learning resources.*** The key objective of enhancing the WiFi infrastructure for schools under the WiFi-100 Scheme and the WiFi-900 Scheme was to cater to the need of using e-textbooks and e-learning resources in class. The results of the annual school survey conducted for 2016/17 revealed the adoption rates of e-textbooks and e-learning resources among the 310 primary schools and 282 secondary schools that had completed the enhancement of their WiFi infrastructure. Two bases can be used to gauge adoption rates of e-textbooks and e-learning resources: (a) adoption rate on school basis is measured by dividing the number of schools that at least one class in the school had adopted e-textbooks/e-learning resources for any subject by the total number of schools; and (b) usage rate on class-level basis for a subject is measured by dividing the number of class levels in the schools that at least one class in the level had adopted e-textbooks/e-learning resources for the subject by the total number of class levels in the schools. On school basis, the adoption rates in 2016/17 of e-textbooks and e-learning resources in primary schools were 64% and 99.4% respectively, and in secondary schools were 32% and 96.8% respectively. However, on class-level basis, the average usage rates of e-textbooks and e-learning resources across subjects were 24% and 65% respectively in primary schools, and 8% and 66% respectively in secondary schools. The usage rates on class-level basis were lower than the adoption rates on school basis (paras. 2.12 to 2.14).

7. ***Need to further promote the EDB's recommended practice of separating WiFi network from schools' existing networks.*** According to the documents prepared by the consultant for schools' reference, the WiFi network is to be built as a separate network from existing school networks. In case schools opt for the mode of integrating the WiFi network with their existing networks, they may need to take note on the relevant security concerns. In June 2014, the EDB issued letters to 14 participating schools under the WiFi-100 Scheme that planned to integrate the WiFi network with their existing networks reminding them of the potential risk and extra resources that such practices might incur. In January 2016, the EDB added a new recommended practice to its guidelines on IT security in schools recommending schools to build the WiFi network completely separate from schools' existing networks with separate broadband line. Audit examination of implementation progress returns submitted by 50 participating schools under the WiFi-900 Scheme revealed that there were 11 (22%) schools that had integrated the WiFi network with their existing networks. Audit considers that the EDB needs to further promote the

recommended practice of building the schools' WiFi network completely separate from their existing networks with separate broadband line for better security management. The EDB also needs to remind schools adopting the integrated mode of WiFi networks to address the security concerns on integrating the networks and take appropriate IT security measures accordingly (paras. 2.15, 2.16 and 2.18).

8. ***Need to improve the administration of CITG.*** In 2004/05, the EDB launched the CITG (see para. 3). Under the CITG, all public sector schools are provided with an annual grant to meet their operational needs for implementing IT in education. In financial year 2016-17, the total amount of CITG provided to 907 schools was $352 million. Audit noted the following: (a) the EDB has stipulated in its circular to schools and in the CITG website that schools are required to relate the schools' IT budget to the annual School Development Plans. Audit examination of the annual School Development Plans of 40 schools revealed that 6 (15%) schools did not make such a correlation; and (b) some schools did not fully utilise the CITG allocation to develop IT in education. Audit examined the provision of the CITG to schools and the actual expenditure for the periods from financial years 2012-13 to 2016-17 for government schools and school years 2012/13 to 2016/17 for aided schools, and found that 517 (57.7%) of the 896 schools examined had used less than the total amount of CITG allocation in the five years, including 131 (14.6%) schools that had unused funds representing more than 20% of the total allocation in the five years (comprising 107 schools with percentages of unused allocation ranging from more than 20% to 40%; 21 schools with percentages ranging from more than 40% to 60%; and 3 schools with percentages of more than 60%). In September 2017, the EDB launched the Information Technology Staffing Support Grant (ITSSG). The provision of the ITSSG had significantly increased the resources provided to schools for the development of IT in education by 50% (from $352 million in financial year 2016-17 to $529 million in financial year 2017-18). This might result in a higher level of unused CITG allocation. The EDB needs to encourage schools to put into effective use the resources allocated to them for the development of IT in education (paras. 2.21, 2.23, 2.24 and 2.26 to 2.28).

Development of e-textbooks and procurement of e-learning resources

9. ***Need to step up efforts to facilitate the development of e-textbooks.*** In December 2011, the Secretary for Education accepted the recommendations of the Task Force to Review Learning and Teaching Materials that: (a) e-learning resources

should move beyond their existing supportive role to a more vital role of e-textbooks, to form a complete and independent set of learning and teaching materials developed according to the requirements of the local curricula; and (b) the development of e-textbooks should be promoted in order to introduce competition for the purpose of regulating the distorted textbook market as well as to provide users with greater choice of effective learning and teaching materials. As at April 2018, 479 sets of printed textbooks were available on the Recommended Textbook List covering 46 subject sets, whereas only 49 sets of e-textbooks were available on the Recommended Textbook List for e-textbooks (eRTL) covering 20 subject sets. Audit analysis revealed that the number of e-textbook sets available for users to choose on the eRTL as at April 2018 for each of the four Key Stages, namely Primary 1 to 3, Primary 4 to 6, Secondary 1 to 3, and Secondary 4 to 6, were 13, 14, 22 and 0 respectively. Furthermore, the number of subject sets in which e-textbooks were available on the eRTL for the four Key Stages were 6, 6, 8 and 0 respectively. In particular, no e-textbooks were available on the eRTL for Key Stage 4 (i.e. class levels at Secondary 4 to 6) (paras. 3.2 and 3.6).

10. ***Considerable number of schools used e-textbooks not on eRTL.*** The eRTL has been published by the EDB since 2014/15. According to the EDB, the quality of e-textbooks submitted for review would be subject to the quality assurance criteria derived from the experience in the vetting of printed textbooks. Audit analysed the schools that adopted e-textbooks for the three major subjects (i.e. Chinese Language, English Language and Mathematics) and found that the percentages of primary schools and secondary schools that adopted e-textbooks not on the eRTL ranged from 28% to 34% and 45% to 48% respectively (paras. 3.8 and 3.9).

11. ***Need to improve the e-learning resources procured under the e-Resources Acquisition Project.*** Of the $105 million earmarked for the implementation of ITE4, $10 million was granted to the HKECL for the e-Resource Acquisition Project (eREAP). The HKECL was responsible to source suitable e-learning resources for use by schools. Of the 128 e-learning resources proposals received, 8 passed the screening and were made available for schools' adoption in eREAP. Audit noted the following: (a) a total of 205 schools participated in the first year of eREAP. Of these 205 schools, 46 (22%) did not participate in the second year. The main reasons for the schools' withdrawal from eREAP were the suitability of the e-learning resources to the schools and the schools' different priorities in learning and teaching; and (b) while the e-learning resources procured under eREAP covered various subjects including English Language, Mathematics and Liberal Studies, they did not cover Chinese Language. In December 2017, the HKECL

conducted a survey to collect the views from 66 participating schools of eREAP. According to the survey results, about 39% of the teachers from the 66 schools suggested that Chinese Language should be covered in eREAP and it was one of the three subjects suggested by most teachers (paras. 3.15, 3.16 and 3.18 to 3.22).

12. ***Need to improve the development and usage of Online Integration Services Platform for e-textbooks and e-learning resources.*** In March 2014, the EDB and the HKECL entered into agreement for the development of the Online Integration Services Platform (OISP). The OISP included two components, namely the Single Sign On (SSO) for providing a one-stop account management for students, teachers and content providers of e-textbooks and e-learning resources, and EdBookshelf for serving as an exchange platform for delivery of e-textbooks and e-learning resources from content providers to students' network storage, and facilitating exchange of learning data between content providers and schools. Audit noted the following: (a) in the four-year period from 2014/15 to 2017/18, the total number of teacher members and student members of the HKECL as at the end of each school year ranged from 628,724 to 666,957. During the same period, the number of members using the SSO and EdBookshelf each year increased from 17,988 to 60,294 and 3,148 to 17,080 respectively. Notwithstanding the increase, there is still room to encourage more members to use the SSO and EdBookshelf; (b) as at 30 June 2018, 1,221 e-books were available at EdBookshelf. However, none of the e-books were e-textbooks on the eRTL. There is a need to enhance usage of EdBookshelf by e-textbook publishers; and (c) as at 30 June 2018, of the 1,221 e-books uploaded to EdBookshelf by 38 content providers, only eight e-books developed by one content provider had the function of retrieving learning data from them enabled. According to the EDB, designing e-books with learning data analysis is a more advanced design and is more effective to facilitate learning (paras. 3.25, 3.27, 3.28 and 3.30).

Professional development of school leaders and teachers

13. ***Need to improve the award rate of certificate of some commissioned courses.*** The IT in Education Section of the EDB organises professional development programmes to better equip school leaders and teachers with the necessary knowledge and skills on the latest practice of e-learning. Courses are provided by the EDB or commissioned to service providers. The EDB entered into separate contracts with the service providers for the provision of each commissioned course. A commissioned course may run a number of times (each time is known as an event). The service providers would issue a certificate to each participant who achieved full attendance and submitted the course-related work within two weeks after the last session of the

event. The certificate award rate is the percentage of participants who fulfil both required conditions. Audit noted that the rates of some events were not high. For instance, in many events the rate was not higher than 70% (i.e. not more than 70% of participants having achieved full attendance and submitted course-related work before deadline). The percentage of events awarding the certificate to more than 70% of the participants, had decreased from 74.0% (57 of 77 events) in 2015/16 to 61.6% (45 of 73 events) in 2016/17 (paras. 4.2, 4.4, 4.5 and 4.7).

Monitoring of implementation of IT in education

14. ***Annual school survey on progress of implementation of IT in education***. Since 2015/16, the EDB has conducted annual school surveys covering public sector schools and DSS schools. The annual school surveys collect information from schools on their progress of implementing IT in education covering aspects such as schools' IT environment and infrastructure, and the use of e-resources for learning (para. 5.2). Audit noted that:

(a) ***Need to follow up with schools that did not respond to the annual school surveys.*** Of the 984 schools covered in the survey for 2016/17, 715 (72.7%) schools replied while 269 (27.3%) did not respond to the survey. Of the 269 schools which did not respond to the annual school survey for 2016/17, 187 (69.5%) also did not respond to or were not covered by the preceding survey for 2015/16. Omitting schools that decided not to respond to the survey may have a bearing on the survey results (para. 5.4); and

(b) ***Some schools were behind their targets in implementing e-learning.*** Of the 715 schools that responded to the survey for 2016/17, 56 (7.8%) indicated that their progresses on implementing e-learning were behind the targets set in their three-year School Development Plans. The EDB had not ascertained why their progresses were behind targets and explored whether these schools would need any assistance from the EDB to help them catch up with the progresses (para. 5.5).

Audit recommendations

15. **Audit recommendations are made in the respective sections of this Audit Report. Only the key ones are highlighted in this Executive Summary. Audit has *recommended* that the Secretary for Education should:**

Provision of resources to schools

(a) **consider measures to keep track of how schools fulfil the commitment they made in seeking funding for enhancing their WiFi infrastructure and, where necessary, provide assistance to them to improve their readiness in implementing e-learning (para. 2.19(a));**

(b) **understand the concerns and considerations of schools in adopting e-textbooks and take measures to encourage schools to extend their usage of e-textbooks where there are merits in doing so (para. 2.19(b));**

(c) **continue the EDB's efforts in promoting the usage of e-learning resources (para. 2.19(c));**

(d) **further promote the recommended practice of building the schools' WiFi network completely separate from the existing networks with separate broadband line for better security management (para. 2.19(d));**

(e) **remind schools adopting the integrated mode of WiFi networks to address the security concerns on integrating the networks and take appropriate IT security measures accordingly (para. 2.19(e));**

(f) **take measures to encourage schools to relate the schools' IT budgets to the annual School Development Plans with a view to enhancing the accountability and transparency of the schools' use of the CITG (para. 2.29(a));**

(g) **take measures to encourage schools, in particular schools with significant level of unused CITG funding, to monitor the utilisation of the CITG and put into effective use the resources allocated to them for the development of IT in education (para. 2.29(b));**

Development of e-textbooks and procurement of e-learning resources

(h) **in consultation with the Steering Committee on Strategic Development of Information Technology in Education, determine the way forward and consider ways to facilitate the future development of e-textbooks (para. 3.13(a));**

(i) **continue to monitor the development of the eRTL (para. 3.13(b));**

(j) **promote the eRTL as a quality vetting and assurance mechanism for e-textbooks among e-textbook developers and schools and encourage e-textbook developers to submit e-textbooks for review (para. 3.13(c) and (d));**

(k) **in collaboration with the HKECL, consolidate the experience gained from the implementation of eREAP with a view to improving eREAP and determining the way forward for e-learning resources acquisition (para. 3.23(a));**

(l) **explore ways to source more quality e-learning resources in the market, in particular for Chinese Language (para. 3.23(b));**

(m) **urge the HKECL to further promote the usage of the SSO and EdBookshelf among HKECL members (para. 3.31(a));**

(n) **urge the HKECL to keep in view the challenges faced by and considerations of e-textbook developers and take measures to address their concerns where necessary with a view to enhancing the usage of EdBookshelf by e-textbook publishers (para. 3.31(b));**

(o) **urge the HKECL to encourage content providers to enable the function of EdBookshelf to retrieve data from their e-books with a view to facilitating exchange of learning data between content providers and schools (para. 3.31(c));**

Professional development of school leaders and teachers

(p) **take measures to improve the certificate award rate of the commissioned courses (para. 4.10(a));**

Monitoring of implementation of IT in education

(q) **step up efforts to follow up with schools that did not respond to the annual school survey as far as practicable (para. 5.7(a)); and**

(r) **keep in view schools which considered their progresses of implementing e-learning behind the targets set in their School Development Plans, and proactively offer timely advice and assistance to them where necessary (para. 5.7(b)).**

Response from the Government

16. The Government fully appreciates Audit's efforts in conducting the review and making recommendations to improve the implementation of IT in education and generally agrees with the audit recommendations.

PART 1: INTRODUCTION

1.1 This PART describes the background to the audit and outlines the audit objectives and scope.

Background

1.2 In line with the global trend of harnessing Information Technology (IT) to facilitate learning and teaching, the then Education Department (Note 1) has implemented various strategies on IT in education and other e-learning initiatives since 1998/99 school year (Note 2). The Education Bureau (EDB) published the first strategy document on promoting IT in education in November 1998, namely the First Strategy on IT in Education (ITE1). The EDB subsequently updated the document and issued the Second, Third and Fourth Strategies on IT in Education (ITE2, ITE3 and ITE4) in 2003/04, 2007/08 and 2015/16 respectively.

ITE1 to ITE3

1.3 In the period from 1998/99 to 2013/14, the EDB launched ITE1 to ITE3. Details are as follows:

(a) ***ITE1***. ITE1, covering the period 1998/99 to 2002/03, focused on equipping schools with necessary IT facilities, connecting them to the Internet and the provision of digital resources for learning and teaching. The funding earmarked for the implementation of ITE1 was $3,223 million. The actual expenditure was $3,103 million;

Note 1: *In January 2003, the then Education Department was merged with the then Education and Manpower Bureau. In July 2007, the Bureau was renamed as the Education Bureau upon the reorganisation of the Government Secretariat. For simplicity, the then Education Department and the then Education and Manpower Bureau are referred to as the Education Bureau in this Audit Report.*

Note 2: *Unless otherwise stated, all years mentioned hereinafter refer to school years, which start on 1 September of a year and end on 31 August of the following year.*

(b) ***ITE2***. ITE2, covering the period 2003/04 to 2006/07, aimed to enhance students' IT literacy, build up teachers' capacity, nurture e-leadership among school leaders, engage the community in creating an environment conducive to the use of IT in education and narrow the digital divide. The funding earmarked for the implementation of ITE2 was $336 million. The actual expenditure was $292 million; and

(c) ***ITE3***. ITE3, covering the period 2007/08 to 2013/14, aimed to assist schools in drawing up and implementing school-based IT in education development plans, and integrating IT into learning and teaching activities so as to improve students' learning effectiveness. The funding earmarked for the implementation of ITE3 was $252 million. The actual expenditure was $247 million.

According to the EDB, ITE1 to ITE3 laid a solid foundation in areas such as the provision of basic IT infrastructure and learning resources, and enhancement of teachers' professional capacity and student learning. Appendix A shows the details of programmes and the outcomes of ITE1 to ITE3.

ITE4

1.4 In 2015/16, the EDB launched ITE4. According to the EDB, ITE4 took shape within evolving contexts — the macro environment, strengths and the experiences gained from previous strategies on IT in education and other interim e-learning projects. IT is evolving rapidly and there are multiple pathways and pedagogies developed to make use of IT in learning and teaching. The role of the EDB is to facilitate the school sector in harnessing the development with a view to helping students fully develop their potential.

1.5 According to the EDB, the goal of ITE4 is to unleash the learning power of students to learn to learn and to excel through realising the potential of IT in enhancing interactive learning and teaching experiences. ITE4 covers the following six key actions:

(a) enhancing schools' IT infrastructure and re-engineering the operation mode;

(b) enhancing the quality of e-learning resources (including e-textbooks);

(c) renewing curriculum, transforming pedagogical and assessment practices;

(d) building professional leadership, capacity and communities of practice;

(e) involving parents, stakeholders and community; and

(f) sustaining a coherent development of IT in education.

1.6 The EDB earmarked $105 million to implement ITE4. Details are as follows:

(a) ***WiFi-900 Scheme.*** An amount of $90 million was provided for the WiFi-900 Scheme. The objective of the Scheme is to enable the public sector schools (i.e. government schools, aided schools, caput schools (Note 3) and special schools) and local schools under the Direct Subsidy Scheme (DSS) not covered by the WiFi-100 Scheme (see para. 1.8(g)(i)) to acquire mobile computing devices to tie in with their acquisition of WiFi services covering all classrooms (see para. 2.5);

(b) ***Grant to Hong Kong Education City Limited for enriching of e-learning resources.*** A one-off grant of $10 million was provided to the Hong Kong Education City Limited (HKECL) (see para. 1.8(c)) to enrich e-learning resources with a view to providing more choices for teachers and students; and

(c) ***Other supports.*** An amount of $5 million was provided to implement measures to reach out to parents and to provide schools with the necessary support including technical advisory services and/or centralised procurement procedures.

Note 3: *Caput schools are non-profit-making private secondary schools in receipt of government subsidy since 1971 when the Government bought school places from private schools due to inadequate supply of public secondary school places.*

Introduction

As at 31 March 2018, the actual expenditure on the implementation of ITE4 was $99.5 million.

1.7 According to the EDB:

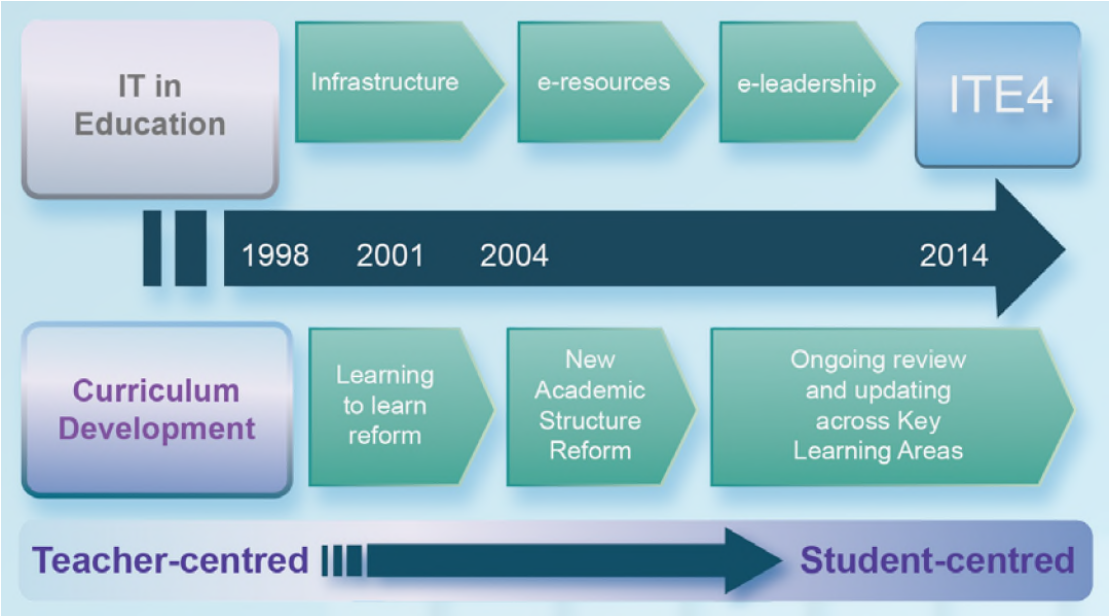
(a) the EDB implemented the strategies on IT in education in tandem with the basic education curriculum reform and the New Senior Secondary Curriculum and Assessment Reform, focusing on students' learning to learn for lifelong learning and whole-person development. There is a common holistic vision between IT in education (with three key elements, namely infrastructure, e-resources and e-leadership) and curriculum development involving a paradigm shift from teacher-centred learning to student-centred learning (see Figure 1);

(b) ITE4 has laid down the basic provisions in terms of hardware and resources for the practice of e-learning in schools. With the basic provisions, schools are able to devise their own plan having regard to their school circumstances and development needs. A rich repertoire of strategies in learning and teaching, beyond the use of e-textbooks (see para. 3.2) or e-teaching resources, are identified and disseminated via channels such as training/sharing sessions and the IT in Education Centres of Excellence (CoE — see para. 4.3) Scheme; and

(c) in view of the evolving and diversified nature of e-learning, there is no best practice or standard towards which schools should comply with, not to mention that e-learning measures are not necessarily more effective than conventional measures in every case.

Figure 1

Implementation of the IT in education with curriculum development



Source: EDB records

Other measures to harness IT to facilitate learning and teaching

1.8 In addition to ITE1 to ITE4, the EDB has taken other measures to harness IT to facilitate learning and teaching:

Recurrent measures

(a) ***Composite Information Technology Grant.*** All public sector schools are provided with recurrent financial assistance under the Composite Information Technology Grant (CITG) (Note 4) as a source of ongoing

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Note 4: *Prior to financial year 2004-05, schools were provided with four types of recurrent grants for various IT in education purposes, namely: (a) the recurrent grant of the Multimedia Computers for Primary School Project; (b) the recurrent grant of the IT in Education Project; (c) the incentive grant for extending the opening hours of school's computer facilities; and (d) the cash grant for employing on-site technical support personnel or hiring technical support services from a contractor. With effect from financial year 2004-05, the four types of recurrent grants have been merged to form an annual recurrent CITG.*

funding to meet their operational needs for IT in education. The CITG is one of the constituent grants under a block grant. The aims of the block grant are to provide schools with greater flexibility in the use of resources and to support the implementation of school-based management (see paras. 2.22 and 2.25). In financial year 2016-17, the total amount of CITG provided to schools was $352 million (included in the block grant);

(b) ***Professional development activities***. A range of professional development activities were organised by the EDB for education professionals (i.e. school leaders and teachers) to enhance their knowledge and skills to promote e-learning as part of the on-going professional capacity building programmes. Courses are either organised by the EDB (including events conducted by seconded teachers under the IT in Education CoE Scheme, or jointly organised with IT industry, relevant government departments and teachers associations), or commissioned to local tertiary institutions (see para. 4.4). The expenditure on the courses organised by the EDB was subsumed under the expenditure of the IT in Education Section. In financial year 2016-17, the expenditure on commissioned courses was $3.8 million;

(c) ***Education portal operated by the HKECL***. The HKECL (Note 5) operates an education portal, which incorporates information, resources, interactive communities and online services, and promotes the use of IT in improving the effectiveness of learning and teaching. In financial year 2016-17, the amount of subvention provided to the HKECL was $34 million;

(d) ***Projects funded by the Quality Education Fund***. The Quality Education Fund (QEF) funds a wide range of one-off projects that promote quality education in schools. These projects are of diverse nature that improve the quality of education of the individual applicant schools. Some projects are IT related. In 2016/17, the QEF approved $170 million to support 560 projects to promote quality of education, of which 84 were IT related (total approved funding was $52 million);

Note 5: *Established in 2000 with the support of the Quality Education Fund, the HKECL was incorporated in 2002 to become a wholly-owned company of the Government. The HKECL is managed by a Board of Directors which provides strategic guidance and direction for the company.*

Non-recurrent measures

(e) ***Pilot Scheme on E-Learning in Schools***. The three-year Pilot Scheme on E-Learning in Schools was implemented in the period from 2011 to 2013 with a non-recurrent funding of $68 million to tap into the changing pedagogical practices and pave the way for wider adoption of e-learning in schools. The actual expenditure of the Pilot Scheme was $65.8 million;

(f) ***E-textbook Market Development Scheme***. E-textbook Market Development Scheme (EMADS) was launched in 2012 with a non-recurrent commitment of $50 million to facilitate the development of e-textbooks in line with the local school curricula for use starting from 2014/15. As at 31 March 2018, the actual expenditure of EMADS was $36.6 million; and

(g) ***Scheme for Supporting Schools to Adopt E-textbooks***. A non-recurrent commitment of $50 million covering the period from 2014 to 2017 was approved for the Scheme for Supporting Schools to Adopt E-textbooks. Details are as follows:

(i) ***WiFi-100 Scheme.*** Under the WiFi-100 Scheme, an amount of $35 million was provided to 100 schools (including public sector schools and DSS schools) to enhance their IT infrastructure, mainly setting up of WiFi network and procurement of mobile computing devices;

(ii) ***Technical and project management support.*** An amount of $3 million was used for the provision of centrally arranged technical and project management support for the implementation of the WiFi-100 Scheme;

(iii) ***Online Integration Services Platform.*** A one-off grant of $10 million was provided to the HKECL for the development of an Online Integration Services Platform (OISP). The Platform can link up schools' learning management system and various online content platforms used by e-learning resources; and

(iv) ***Professional development.*** An amount of $2 million was provided for the professional development programmes (see para. 4.2) to help teachers establish sound pedagogy for using e-textbooks.

As at 31 March 2018, the actual expenditure of the Scheme was $48.9 million.

1.9 The IT in Education Section of the EDB is responsible for the formulation, implementation and monitoring of e-learning initiatives for enhancing learning and teaching effectiveness in primary and secondary education, including the provision of funding and other professional support to the schools. The Section is headed by a Chief Curriculum Development Officer. As at 31 August 2018, the Section had an establishment of 21 staff, including 17 civil service staff and 4 staff on contract terms. An extract of the organisation chart of the EDB is shown at Appendix B.

Audit review

1.10 In March 2018, the Audit Commission (Audit) commenced a review of the EDB's efforts in harnessing IT to facilitate learning and teaching. The review has focused on the following areas:

(a) provision of resources to schools (PART 2);

(b) development of e-textbooks and procurement of e-learning resources (PART 3);

(c) professional development of school leaders and teachers (PART 4); and

(d) monitoring of implementation of IT in education (PART 5).

Audit has found room for improvement in the above areas and has made a number of recommendations to address the issues.

General response from the Government

1.11 The Secretary for Education generally agrees with the audit recommendations. He has said that he fully appreciates Audit's efforts in conducting the review and making recommendations to improve the implementation of IT in education. He will consider appropriate actions to follow up the audit recommendations.

Acknowledgement

1.12 Audit would like to acknowledge with gratitude the full cooperation of the staff of the EDB during the course of the audit review.

PART 2: PROVISION OF RESOURCES TO SCHOOLS

2.1 This PART examines the provision of resources to schools by the EDB to facilitate schools' implementation of IT in education. Audit found room for improvement in the following areas:

(a) enhancement of WiFi infrastructure at schools (paras. 2.2 to 2.20); and

(b) administration of CITG (paras. 2.21 to 2.30).

Enhancement of WiFi infrastructure at schools

2.2 With the proliferation of mobile computing devices and their increased use for learning, the EDB considers that there is a need for the establishment of a robust WiFi infrastructure to cover all classrooms of the school premises. Provision of WiFi access in all public sector schools and DSS schools is a key action area under ITE4.

WiFi-100 Scheme

2.3 In January 2014, the EDB obtained the approval from the Finance Committee (FC) of the Legislative Council (LegCo) to launch the WiFi-100 Scheme as a pioneer measure. The objective of the Scheme is to support schools in using e-textbooks developed under EMADS in 2014/15. Under the Scheme, a one-off grant of $35 million was provided to 100 public sector schools and DSS schools. On average, each school was granted $350,000, of which:

(a) an amount of $100,000 was for acquiring mobile computing devices because the "bring-your-own-device" approach was not common. The EDB considered that an average of 50 devices per school should be sufficient for groups of two to three students to share one device to carry out technology-dependent activities such as Internet search, downloading worksheets, etc.; and

(b) an amount of $250,000 was for setting up the necessary WiFi environment in their school premises for use of e-textbooks in class, including the enhancement of their IT infrastructure and the subscription of WiFi services for three years from 2014/15 to 2016/17.

2.4 In mid-January 2014, the EDB invited schools to apply for the WiFi-100 Scheme. Applicant schools were required to formulate a three-year e-learning development plan. Based on the development plans and factors such as the schools' track record on IT in education and e-learning, the EDB reviewed the schools' readiness and suitability for joining the Scheme. Of 174 applications received, 100 were approved. To ensure that the necessary WiFi environment was built in time to enable the use of e-textbooks developed under EMADS in 2014/15, technical and project management support was centrally arranged by the EDB for servicing the 100 schools. The services arranged by the EDB included technical advice on the design of the WiFi infrastructure and monitoring of the work of service providers.

WiFi-900 Scheme

2.5 Taking into account the experience of the schools under the WiFi-100 Scheme, the EDB considered that WiFi infrastructure was an essential facility for the practice of e-learning, and all public sector and DSS schools should be provided with the support for WiFi infrastructure enhancement. As an extension to the WiFi-100 Scheme, the WiFi-900 Scheme was launched in August 2015. It aimed to set up a robust WiFi infrastructure by phases over three years from 2015/16 to 2017/18 for the public sector schools and DSS schools not covered in the WiFi-100 Scheme. A total of 887 schools participated in the WiFi-900 Scheme (Note 6). The EDB provided:

(a) a one-off grant of $90 million, at an average of about $100,000 per school, for the schools to acquire mobile computing devices for shared use among students in class to tie in with their acquisition of WiFi services covering all classrooms; and

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Note 6: *A total of 889 schools were eligible to participate in the WiFi-900 Scheme. Two DSS schools decided not to participate in the Scheme.*

(b) a recurrent grant at an average of about $70,000 per school per year for the schools to pay for any service fees in setting up the necessary WiFi environment in their school premises for use of e-textbooks or curriculum-based e-learning resources in class, and also the maintenance fees for mobile computing devices (Note 7). In financial year 2017-18, the amount of grant provided to schools was about $66 million.

2.6 The WiFi infrastructure enhancement works of the schools joining the WiFi-900 Scheme have been basically completed by 2017/18. As at 31 August 2018, of the 987 schools (100 schools under the WiFi-100 Scheme and 887 schools under the WiFi-900 Scheme), 976 (99%) had completed the WiFi infrastructure enhancement at their premises. Among the remaining 11 schools, 4 completed the WiFi infrastructure enhancement works in October 2018, 5 opted to join the WiFi-900 Scheme in 2018/19 and 2 will join in 2019/20 (due to special circumstances such as relocation of school premises). Annual school surveys were carried out by the EDB to give a holistic understanding of the implementation of ITE4 in schools in order to fine-tune the actions and identify future support measures. According to the survey conducted for 2016/17, each of the 715 schools that responded to the survey, on average, had 87 mobile computing devices.

Need to provide further assistance to schools

2.7 In February 2015, the EDB required the schools that intended to participate in the WiFi-900 Scheme to submit an Expression of Interest (EOI) to indicate their tentative e-learning implementation plan and their preference of the time to complete the WiFi enhancement among the three school years before 2017/18. Based on the EOIs, the EDB reviewed the readiness of the schools in implementing e-learning in terms of five aspects:

(a) ***School Development Planning.*** This aspect was reviewed based on the school's development priorities in the implementation of e-learning in its three-year School Development Plan;

Note 7: *Schools that participated in the WiFi-100 Scheme were also eligible for the recurrent grant starting from 2017/18.*

(b) ***Schedule for using e-textbooks or e-learning resources.*** This aspect was reviewed based on the coherence of school's schedule of using e-textbooks and e-learning resources, and its strategies of integrating IT in the subjects and levels;

(c) ***Teachers' readiness.*** This aspect was reviewed based on the number of teachers considered ready for adopting e-learning, number of teachers who would be involved in adopting e-learning in the next three school years, their commitment to participate in the professional development activities on e-learning, and the school's own professional development plan on e-learning;

(d) ***Engagement of stakeholders.*** This aspect was reviewed based on the support obtained from school management committee or incorporated management committee, teachers and parents on the whole-school adoption of e-learning; and

(e) ***Plan for the build-up of mobile learning environment.*** This aspect was reviewed based on the existing IT infrastructure in terms of WiFi coverage in classrooms and number of mobile computing devices, the mode adopted for enhancement of WiFi infrastructure and the school's plan or policy on managing increasing number of mobile computing devices.

2.8 After reviewing the EOIs submitted by schools, the EDB found that some schools were less ready to implement e-learning in terms of their teachers' readiness and engagement of stakeholders. In April 2015, the Steering Committee on Strategic Development of Information Technology in Education (Note 8) advised the EDB for those schools considered to be less ready, the EDB would provide funding support to the schools on the condition that they would commit to taking further actions to enhance teachers' readiness and solicit stakeholders' support.

Note 8: *The Steering Committee on Strategic Development of Information Technology in Education is chaired by a Deputy Secretary of the EDB. As at April 2018, it had 11 non-official members and five official members. The terms of reference of the Steering Committee are to advise: (a) the EDB on the strategic direction, implementation and evaluation of integrating IT into education; (b) the EDB on the latest technologies and associated pedagogy as well as global trend on policies and practices in using IT to improve the quality of education; (c) on the implementation of e-learning in schools; and (d) the EDB on the way forward for e-learning in Hong Kong.*

Provision of resources to schools

2.9 Among the 887 schools under the WiFi-900 Scheme, 334 (38%) were considered less ready to implement e-learning in terms of their teachers' readiness and engagement of stakeholders. Following the advice of the Steering Committee on Strategic Development of Information Technology in Education, the EDB provided funding to the 334 schools after obtaining their written confirmations committing to make improvement in the two aspects as the condition for receiving the funding to enhance their WiFi infrastructure. Various supports were also provided to the schools, e.g. on-site support service by the IT in Education CoE Scheme, relevant online resources as well as technical support services.

2.10 The EDB informed Audit in October 2018 that the 2015 EOI exercise was conducted to obtain an overview of the situation of schools joining the WiFi-900 Scheme for reference, in particular for facilitating funding requirement projection. It was a one-off snap-shot exercise and was not meant to be a tool for setting a base-line to track whether school had fulfilled their commitments.

2.11 At the end of 2016/17, 224 (67%) of the 334 schools had enhanced their WiFi infrastructure. Audit examined the results of the annual school survey conducted by the EDB for 2016/17 and noted that:

(a) ***Stakeholders' engagement.*** Information regarding stakeholders' engagement was not sought in the survey; and

(b) ***Teachers' readiness.*** Of the 224 schools (see Table 1):

  (i) 47 did not respond to the survey or did not provide information on their readiness in teacher development in their responses; and

  (ii) 88 considered themselves less than ready or not ready in the teacher development for integrating e-learning into their school curricula.

Table 1

Readiness in teacher development reported by schools that had committed to make improvement in the aspect (2016/17)

Teachers' readiness	No. of schools	Percentage
More than ready	4	1.8%
Ready	85	37.9%
Less than ready	86 (88)	38.4% (39.3%)
Not ready	2	0.9%
No information	47	21.0%
Total	224	100.0%

Source: Audit analysis of EDB records

Audit considers that the EDB needs to consider measures to keep track of how schools fulfil the commitment they made in seeking funding for enhancing their WiFi infrastructure and, where necessary, provide assistance to them to improve their readiness in implementing e-learning.

Need to continue to promote the usage of e-textbooks and e-learning resources

2.12 The key objective of enhancing the WiFi infrastructure for schools under the WiFi-100 Scheme and the WiFi-900 Scheme was to cater for the need of using e-textbooks and e-learning resources (see paras. 3.2 and 3.15) in class. Since 2015/16, the EDB has conducted annual school surveys on the use of e-textbooks and e-learning resources among schools. In the annual school surveys, schools were asked, for each class level (Primary 1 to 6 and Secondary 1 to 6) and for each

subject (Note 9), whether e-textbooks and/or e-learning resources were used. In April 2018, in response to questions raised by Members of LegCo, the EDB said that:

(a) in 2015/16, 74.7% of primary schools and 10.0% of secondary schools used e-textbooks on a trial basis and/or purchased e-textbooks; and

(b) in 2016/17, 62.7% of primary schools and 31.3% of secondary schools purchased and used e-textbooks for one or more than one subject.

2.13 Audit examined the results of the annual school survey conducted for 2016/17 to assess the extent to which e-textbooks and e-learning resources were adopted across class levels and subjects in schools. Audit noted that among the 310 primary schools and 282 secondary schools that had completed the enhancement of their WiFi infrastructure:

(a) ***Primary schools.*** The average percentages of e-textbooks and e-learning resources adoption across class levels and subjects were 24% (ranging from 3% to 44%) and 65% (ranging from 35% to 77%) respectively (see Table 2); and

(b) ***Secondary schools.*** The average percentages of e-textbooks and e-learning resources adoption across class levels and subjects were 8% (ranging from 3% to 17%) and 66% (ranging from 52% to 81%) respectively (see Table 3).

Note 9: *For Primary 1 to 6, six subjects were surveyed, namely: (a) Chinese Language; (b) English Language; (c) Mathematics; (d) General Studies; (e) Computer Literacy; and (f) Visual Arts. For Secondary 1 to 6, eight subjects were surveyed, namely: (a) Chinese Language; (b) English Language; (c) Mathematics; (d) Liberal Studies; (e) Science; (f) Humanities; (g) Computer Literacy; and (h) Visual Arts.*

Table 2

Adoption of e-textbooks and e-learning resources in primary schools (2016/17)

Subject	Percentage of class levels that adopted	
	E-textbooks	E-learning resources
Chinese Language	23%	64%
English Language	24%	73%
Mathematics	25%	77%
General Studies	22%	68%
Computer Literacy	44%	75%
Visual Arts	3%	35%
Average	24%	65%

Source: *Audit analysis of EDB records*

Remarks: *The percentage for a subject was calculated by dividing the number of class levels in the 310 primary schools that at least one class in the level had adopted e-textbooks/e-learning resources for the subject by the total number of class levels of 1,860 (i.e. 6 levels × 310 schools).*

Table 3

Adoption of e-textbooks and e-learning resources in secondary schools (2016/17)

Subject	Percentage of class levels that adopted	
	E-textbooks	E-learning resources
Chinese Language	7%	61%
English Language	7%	67%
Mathematics	8%	67%
Liberal Studies	N.A. (Note)	71%
Science	8%	69%
Humanities	6%	63%
Computer Literacy	17%	81%
Visual Arts	3%	52%
Average	8%	66%

Source: *Audit analysis of EDB records*

Note: *According to the EDB, schools are not recommended to use printed textbooks or e-textbooks for Liberal Studies.*

Remarks: *The percentage for a subject was calculated by dividing the number of class levels in the 282 secondary schools that at least one class in the level had adopted e-textbooks/e-learning resources for the subject by the total number of class levels of 1,692 (i.e. 6 levels × 282 schools).*

2.14 The EDB has informed Audit in October 2018 that:

(a) the EDB takes the adoption rates of e-textbooks and e-learning resources on school basis instead of class-level basis because:

(i) schools select learning and teaching resources, including printed textbooks, e-textbooks and other learning resources that suit their students' needs;

(ii) to cater for learners' diversity, schools have their flexibilities to use e-resources or e-textbooks in any subjects in any classes of a particular level according to their school contexts and students' needs; and

(iii) schools should adopt a new series of textbooks/e-textbooks by progression and not at all year levels at any one time;

(b) according to the results of the annual school survey conducted for 2016/17, 310 primary schools and 282 secondary schools had completed the enhancement of their WiFi infrastructure. On school basis, the adoption rates of e-textbooks and e-learning resources in the primary schools were 64% and 99.4% respectively, and in the secondary schools were 32% and 96.8% respectively. Adoption rate on school basis is measured by dividing the number of schools that at least one class in the school had adopted e-textbooks/e-learning resources for any subject by the total number of schools. On class-level basis (which is not recommended as schools should adopt new series of e-textbooks or e-learning resources by progression, and not all year levels together), the average usage rates of e-textbooks and e-learning resources across subjects were 24% and 65% respectively in the primary schools, and 8% and 66% respectively in the secondary schools. The EDB considers that the usage of e-learning resources is satisfactory;

(c) e-textbooks and e-learning resources contain multi-media learning objects and interactive functions which facilitate students' understanding, self-directed and collaborative learning, and use of new pedagogy by teachers; and

(d) e-textbooks and e-learning resources provide an alternative to their conventional counterparts but have to be adopted with the appropriate pedagogies and hence are not necessarily better than the latter. To equip teachers with e-learning pedagogies, including the use of e-textbooks and e-learning resources in different subjects, the EDB has been conducting various professional development programmes for teachers throughout the year.

Audit considers that the EDB needs to understand the concerns and considerations of schools in adopting e-textbooks and take measures to encourage schools to extend their usage of e-textbooks where there are merits in doing so. The EDB also needs

to continue its efforts in promoting the usage of e-learning resources where there are merits in using them.

Need to further promote the EDB's recommended practice of separating WiFi network from schools' existing networks

2.15 In March 2014, the EDB commissioned a consultant to provide technical and project management support services to the participating schools under the WiFi-100 Scheme (see para. 1.8(g)(i)). According to the documents prepared by the consultant for schools' reference:

(a) the WiFi network is to be built as a separate network from existing school networks; and

(b) in case schools opt for the mode of integrating the WiFi network with their existing networks, they may need to take note on the relevant security concerns.

In May 2014, upon the request of the EDB, the consultant provided a list of 14 participating schools under the WiFi-100 Scheme that planned to integrate the WiFi network with their existing networks. In June 2014, the EDB issued letters to these 14 schools reminding them of the potential risk and extra resources that such practices might incur.

2.16 In January 2016 (about five months after the commencement of the WiFi-900 Scheme in August 2015), the EDB updated its guidelines on IT security in schools (Note 10) for schools' reference in protecting their information and IT assets when implementing e-learning. A new recommended practice on information security for WiFi network was added to the guidelines, as follows:

(a) the EDB recommended that schools build the WiFi network completely separate from schools' existing networks with separate broadband line; and

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Note 10: *In 2002, the EDB issued guidelines on IT security in schools to assist schools in formulating IT security policies and standards for their computer systems. The EDB updates the guidelines from time to time.*

(b) schools' IT personnel needs to consider, understand and eliminate the security issues and risks to existing networks when the WiFi network is integrated or connected to schools' existing networks.

2.17 Although the EDB has been recommending the practice through seminars since May 2015, some schools might not be aware of the new recommended practice or might have already carried out the WiFi enhancement works before the recommended practice was added to the EDB's guidelines (Note 11). Some other schools might have decided not to follow the recommended practice for various reasons, e.g. technical limitations in implementing two broadband lines. The EDB informed Audit in October 2018 that:

(a) the recommended practice is not a mandatory requirement that schools were obliged to observe as schools could adopt different technical solutions; and

(b) under the principle of school-based management, schools were responsible for taking appropriate IT security measures to protect the IT systems and data of their schools, and they may determine their own requirements to adopt the practice where applicable to their own environment and operational needs.

2.18 Audit examination of implementation progress returns submitted by 50 participating schools under the WiFi-900 Scheme revealed that there were 11 (22%) schools that had integrated the WiFi network with their existing networks. Audit considers that the EDB needs to further promote the recommended practice of building the schools' WiFi network completely separate from the existing networks with separate broadband line for better security management. The EDB also needs to remind schools adopting the integrated mode of WiFi networks to address the security concerns on integrating the networks and take appropriate IT security measures accordingly.

Note 11: *Under the WiFi-900 Scheme, 405 schools completed their WiFi enhancement works in 2015/16.*

Audit recommendations

2.19 **Audit has *recommended* that the Secretary for Education should:**

(a) **consider measures to keep track of how schools fulfil the commitment they made in seeking funding for enhancing their WiFi infrastructure and, where necessary, provide assistance to them to improve their readiness in implementing e-learning;**

(b) **understand the concerns and considerations of schools in adopting e-textbooks and take measures to encourage schools to extend their usage of e-textbooks where there are merits in doing so;**

(c) **continue the EDB's efforts in promoting the usage of e-learning resources where there are merits in using them;**

(d) **further promote the recommended practice of building the schools' WiFi network completely separate from the existing networks with separate broadband line for better security management; and**

(e) **remind schools adopting the integrated mode of WiFi networks to address the security concerns on integrating the networks and take appropriate IT security measures accordingly.**

Response from the Government

2.20 The Secretary for Education agrees with the audit recommendations. He has said that:

(a) the EDB has been gauging the progress of IT in education development in schools including those joining the WiFi-900 Scheme through various means such as school visits, on-site support visits, surveys, case studies and proformas returned from schools. The EDB will consider measures to provide further assistance to schools with regard to their needs;

(b) schools select conventional textbooks or e-textbooks for students according to their needs and school contexts. A low adoption rate in using e-textbooks reflects schools' decisions with regard to their own circumstances or

concerns. The responses from school visits and interviews showed that schools are progressively adopting e-resources and e-textbooks in different subjects and levels according to their school plans as reflected in the increasing adoption rate from 2015/16 to 2017/18;

(c) although the EDB considers that the usage of e-learning resources satisfactory (see para. 2.14(b)), the EDB will still continue its efforts in promoting the use of e-learning resources where there are clear merits in using them;

(d) the EDB will continue to conduct school visits and focus group meetings to further understand schools' concerns and considerations in adopting e-textbooks and take various measures to equip teachers with e-learning pedagogies, including the use of e-textbooks in different subjects so that schools are well prepared to extend their usage of e-textbooks where they see clear merits in doing so; and

(e) the EDB has all along been playing a supporting and advisory role to facilitate schools to implement IT security in accordance with their school-based operational needs. While the EDB has been promoting the recommended practice of building the schools' WiFi network completely separate from existing networks, the EDB will explore measures to further promote the recommended practice among schools and remind schools adopting the integration mode to address the security concerns and take appropriate IT security measures accordingly.

Administration of CITG

2.21 In 2004/05, the EDB launched the CITG (see para. 1.8(a)). Under the CITG, all public sector schools are provided with an annual grant to meet their operational needs for implementing IT in education. Schools can use the CITG to meet their operational needs in the following areas:

(a) purchase of IT related consumables;

(b) purchase of digital resource materials for learning and teaching;

(c) Internet connection and Internet security service fees;

(d) employment of technical support personnel or hire of technical support services from service providers;

(e) extension of opening hours for school's IT facilities;

(f) hire of maintenance services for school's IT facilities procured by government funds; and

(g) upgrading and replacement of school's IT facilities.

The amount of CITG provided to each school is determined by the school's category (e.g. primary/secondary/special schools) and the number of approved operating classes. The amount of CITG is adjusted annually in accordance with the movement of the Composite Consumer Price Index. In financial year 2016-17, the total amount of CITG provided to 907 schools was $352 million. The amount received by each school ranged from $292,691 to $569,510, averaging around $388,000.

2.22 The CITG is provided to schools as one of the constituent grants under the Block Grant (Note 12). Schools are required to keep a separate ledger account to reflect all incomes and expenditures chargeable to the CITG according to relevant EDB circular to schools and in the CITG website. If there is any surplus balance of the Block Grant as a whole up to its 12 months' provision, the surplus in excess of such level is subject to clawback by the EDB.

Need to encourage schools to follow recommended procedures of CITG

2.23 The EDB advises schools to make good resource planning to meet their expenses according to their priorities and has stipulated in its circular to schools and in the CITG website that schools are required to relate the schools' IT budgets to the annual School Development Plans.

Note 12: *The name of the Block Grant varies for different types of schools, namely Operating Expenses Block Grant or Expanded Operating Expenses Block Grant for aided schools, and Expanded Subject and Curriculum Block Grant for government schools. If surpluses are available under the CITG, schools may use such funds on items chargeable to other government subsidies.*

2.24 Audit examined the annual School Development Plans of 40 schools and found that 6 (15%) did not relate the schools' IT budgets to the annual School Development Plans. In October 2018, the EDB informed Audit that the word 'required' in its circular to schools and in the CITG website (see para. 2.23) was an inaccurate choice of word and should read 'encouraged'. According to the EDB, schools are not mandated to relate their IT budgets to the annual school-based development plans given the many initiatives that the EDB and schools are pursuing in recent years that are supported by grants (e.g. Science, Technology, Engineering and Mathematics education and renewed emphasis on Chinese History). It would be practically difficult for schools to relate the budget on every initiative to the annual school plan and certain leeway has to be given to schools. The requirements were only recommended procedures. Audit considers that the EDB needs to take measures to encourage schools to relate the schools' IT budgets to the annual School Development Plans with a view to enhancing the accountability and transparency of the schools' use of the CITG.

Need to encourage the utilisation of CITG for development of IT in education

2.25 The CITG is provided to schools as one of the constituent grants under the Block Grant. Schools are provided with great flexibility in the use of resources taking into account their own circumstances to meet the operational needs of schools. For example, schools may deploy the amount allocated under the CITG to other individual constituent grants. The EDB has an established mechanism in place to monitor the schools' spending on their Block Grant. The EDB will issue advisory letters to schools with high level of cumulative surplus of the Block Grant and request them to submit improvement plans. Overall speaking, after the launch of ITE4 in 2015/16, the total expenditure on CITG was about the same as the total allocation. For instance, in 2015/16 and 2016/17, the total expenditure of aided schools exceeded the total allocation by 0.7% and 1.1% respectively.

2.26 Audit recognises that in a short period of a couple of school years, there may be surplus or deficit in the amounts of CITG. To ascertain whether individual schools may make better use of the CITG for development of IT in education, Audit analysed the amount of CITG deployed by schools for the development of IT in education in a longer period. Hence, Audit examined the provision of the CITG to schools and the actual expenditure for the periods from financial years 2012-13 to 2016-17 for government schools and school years 2012/13 to 2016/17 for aided schools, and found that some schools did not fully utilise the CITG allocation for the

development of IT in education. As at 31 July 2018, of the 904 schools that received the CITG in all the years over the five-year period, 8 aided schools have not submitted their audited accounts for school year 2016/17 to the EDB and therefore information on their usage of CITG allocation for 2016/17 was not available. Of the remaining 896 schools, 517 (57.7%) had used less than the total amount of CITG allocation in the five years, including 131 (14.6%) schools that had unused funds representing more than 20% of the total allocation in the five years (see Table 4).

Table 4

Use of CITG by schools for development of IT in education (financial years 2012-13 to 2016-17 for government schools and 2012/13 to 2016/17 for aided schools)

Percentage of unused CITG allocation	No. of schools		Percentage	
No unused allocation	379		42.3%	
5% or less	118		13.1%	
More than 5% to 10%	125		14.0%	
More than 10% to 20%	143		16.0%	
More than 20% to 40%	107		12.0%	
More than 40% to 60%	21	131	2.3%	14.6%
More than 60%	3		0.3%	
Total	896		100.0%	

Source: Audit analysis of EDB records

2.27 In September 2017, the EDB launched the Information Technology Staffing Support Grant (ITSSG). Under the ITSSG:

(a) each public sector school is granted $300,000 per year for strengthening the IT staffing support to practise e-learning and take forward education initiatives which will harness IT. The amount of the ITSSG for each school is adjusted annually in accordance with the movement of the Composite Consumer Price Index; and

(b) schools can use the ITSSG to employ their own staff or appoint IT companies to provide agency workers to render the required technical support in the school campus. Transfer of funds out of the ITSSG for other purposes is not allowed.

2.28 According to the EDB, under the current mechanism of Block Grant, schools can flexibly deploy their resources obtained under the CITG to meet their operational needs on e-learning. The EDB provided the ITSSG because many schools indicated that the level of the CITG was insufficient for schools to employ and retain stable IT support staff. The ITSSG could address the manpower need and schools would be able to use the CITG to procure other IT-related services. However, 131 (14.6%) of the 896 schools had unused CITG allocation of more than 20% (see Table 4). The provision of the ITSSG in September 2017 had significantly increased the resources provided to schools for the development of IT in education. This may result in a higher level of unused CITG allocation. In financial year 2016-17, the amount of the CITG was about $352 million. In financial year 2017-18, the resources available for schools to develop IT in education from the CITG and the ITSSG was $529 million ($358 million from the CITG and $171 million from the ITSSG), representing an increase of 50% over financial year 2016-17. Audit considers that the EDB needs to take measures to encourage schools, in particular schools with significant level of unused CITG funding, to monitor the utilisation of the CITG and put into effective use the resources allocated to them for the development of IT in education.

Audit recommendations

2.29 **Audit has *recommended* that the Secretary for Education should:**

(a) **take measures to encourage schools to relate the schools' IT budgets to the annual School Development Plans with a view to enhancing the accountability and transparency of the schools' use of the CITG; and**

(b) **take measures to encourage schools, in particular schools with significant level of unused CITG funding, to monitor the utilisation of the CITG and put into effective use the resources allocated to them for the development of IT in education.**

Response from the Government

2.30 The Secretary for Education agrees with the audit recommendations. He has said that:

(a) under the principle of school-based management, schools are advised to give due regard to enhancing the accountability and transparency of their operations, and relating the school budget to the annual school plan which is amongst the practices that schools may adopt but are not mandatory requirements;

(b) the EDB will consider measures to further encourage schools to enhance its reporting mechanism on the use of the CITG to their stakeholders while:

  (i) recognising that each school has its own unique development considerations and flexibility has to be given to schools to deal with special circumstances; and

  (ii) continuing to provide room for schools to set their own priorities in school development and accounting for use of their resources in the most appropriate way;

(c) while there is room for some schools to make more effective use of the CITG, the average spending position of schools on the CITG over a prolonged period of five school years from 2012/13 to 2016/17 may not be reliable in reflecting the current utilisation of schools on the CITG as the launch of ITE4 in 2015/16 has created extra demand for schools in engaging more technical support manpower for operation of WiFi network, housekeeping of e-learning resources and managing mobile computing devices, etc. Thus, the CITG was in fact more effectively utilised in 2015/16 and 2016/17;

(d) as schools can keep a surplus balance of the Block Grant as a whole up to its 12 months' provision to meet the operational needs of schools, focusing only on the utilisation of the CITG may not give a holistic picture of the schools' efforts in promoting IT in education. The EDB is pleased that the majority of around 70% schools have used over 90% of the CITG, and many of them in fact have recorded significant overspending; and

(e) the EDB will continue to explore measures to further encourage the School Management Committee or Incorporated Management Committee of schools to make more effective use of the CITG and other related grants to promote the development of IT in education.

PART 3: DEVELOPMENT OF E-TEXTBOOKS AND PROCUREMENT OF E-LEARNING RESOURCES

3.1 This PART examines the EDB's work in the development of e-textbooks and the procurement of e-learning resources for use by schools. Audit found room for improvement in the following areas:

(a) development of e-textbooks (paras. 3.2 to 3.14);

(b) procurement of e-learning resources (paras. 3.15 to 3.24); and

(c) development of OISP for e-textbooks and e-learning resources (paras. 3.25 to 3.32).

Development of e-textbooks

3.2 An e-textbook is a package with digital print-on-demand contents and electronic features (including multimedia such as video, audio and animation, and interactive learning, teaching and assessment activities) that are designed to support the implementation of a school subject. In June 2011, the EDB set up the Task Force to Review Learning and Teaching Materials (Note 13). In December 2011, the Task Force recommended and the Secretary for Education accepted that:

(a) e-learning resources should move beyond their existing supportive role to a more vital role of e-textbooks, to form a complete and independent set of learning and teaching materials developed according to the requirements of the local curricula; and

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Note 13: *The Task Force was chaired by the Under Secretary for Education. It comprised frontline experts and practitioners from the fields of education, business and IT, as well as representatives from parent associations and the Consumer Council.*

(b) the development of e-textbooks should be promoted in order to introduce competition for the purpose of regulating the distorted textbook market as well as to provide users with greater choice of effective learning and teaching materials.

EMADS

3.3 In June 2012, the FC of LegCo approved $50 million for EMADS (see para. 1.8(f)). EMADS aimed to:

(a) facilitate and encourage the participation of potential and aspiring e-textbook developers to develop a diverse range of e-textbooks in line with the local curricula; and

(b) try out a quality vetting and assurance mechanism for e-textbooks with a view to drawing up progressively a full-fledged Recommended Textbook List for e-textbooks (eRTL – Note 14) similar to the Recommended Textbook List (RTL) for printed textbooks.

3.4 EMADS was open to application from organisations, enterprises, academic institutes or societies registered under the laws of the Hong Kong Special Administrative Region. Under EMADS:

(a) each application should cover one subject set (Note 15) of e-textbooks. Each applicant can submit applications for no more than four subject sets;

Note 14: *According to the EDB, to ensure the quality of e-textbooks adopted by schools, e-textbooks will be included in the eRTL only if they have met specific requirements, e.g. relevance to the curriculum guides and accuracy of content.*

Note 15: *The EDB divides primary and secondary education into Key Stages 1 to 4, namely Primary 1 to 3, Primary 4 to 6, Secondary 1 to 3, and Secondary 4 to 6. A subject set refers to a subject taught during a Key Stage, e.g. Mathematics for Primary 4 to 6.*

(b) the EDB would provide funding (Note 16) to the successful non-profit-making applicants under EMADS to cover part of their costs in developing e-textbooks to encourage them to participate in the e-textbook market; and

(c) the Steering Committee on the Selection, Quality Assurance and Review of EMADS was set up to oversee the implementation of EMADS (Note 17). The Steering Committee was responsible for setting the criteria for assessing and approving applications under EMADS, monitoring the implementation of EMADS and advising the Government on all matters related to EMADS.

The e-textbooks developed under EMADS that have successfully passed the quality assurance mechanism were recognised for inclusion into the eRTL.

3.5 Two phases of EMADS were launched. The application periods of the first and second phases were from June to September 2012 and from August to November 2013 respectively. A total of 38 subject sets were open for application in the two phases. In the two phases, the EDB entered into agreements with 12 successful applicants to develop 36 sets of e-textbooks covering 19 subject sets (Note 18). There were no successful applications for the development of e-textbooks for the remaining 19 subject sets (see Appendix C for the results of EMADS).

Note 16: *The amount of funding was capped at 50% of the development cost of the e-textbook project or $4 million per application, whichever was less.*

Note 17: *The Steering Committee was chaired by the Deputy Secretary for Education (Curriculum and Quality Assurance). It comprised experienced school principals and teachers, representatives from the business and the IT sectors, parents, representatives of the Consumer Council, the HKECL and the EDB.*

Note 18: *Of the 12 successful applicants, funding of $39.5 million was provided to 6 non-profit-making applicants to develop 18 sets of e-textbooks. One set of e-textbooks refers to the e-textbooks covering a subject set. Funding was not provided to the remaining 6 successful applicants (not non-profit-making) to develop the remaining 18 sets of e-textbooks (i.e. 36−18). Eventually, two e-textbook sets could not pass the quality assurance mechanism and the developer concerned withdrew from EMADS.*

Need to step up efforts to facilitate the development of e-textbooks

3.6 The printed textbook review system for including printed textbooks on the RTL has been established since 1972. In contrast, the review of e-textbooks for inclusion on the eRTL was introduced only in late 2014. As at April 2018, 479 sets of printed textbooks were available on the RTL covering 46 subject sets. There were 49 sets of e-textbooks available on the eRTL covering 20 subject sets. There is room for the further development of e-textbooks. Audit noted that:

(a) ***Need to expand the number of subject sets provided with e-textbooks on the eRTL.*** As at April 2018, the number of subject sets in which e-textbooks were available on the eRTL for each Key Stage ranged from 0 to 8. E-textbooks were available on the eRTL covering 20 subject sets. In particular, no e-textbooks were available on the eRTL for Key Stage 4 (see Table 5); and

(b) ***Need to enrich the choices of e-textbook sets.*** It was important to have more e-textbook sets available for users to choose. The number of e-textbook sets available for users to choose on the eRTL as at April 2018 for each Key Stage ranged from 0 to 22. In total, there were 49 sets of e-textbooks available (see Table 5).

Table 5

Number of subject sets with e-textbooks and the number of e-textbook sets on the eRTL (April 2018)

Key Stage	Class level	No. of subject sets	No. of e-textbook sets
1	Primary 1 to 3	6	13
2	Primary 4 to 6	6	14
3	Secondary 1 to 3	8	22
4	Secondary 4 to 6	0	0
	Total	20	49

Source: Audit analysis of EDB records

3.7 According to the EDB:

(a) the supply of e-textbooks is market driven;

(b) considering the short history of the eRTL and a much longer time is required for developing a new set of e-textbooks compared to printed textbooks, the number of e-textbook sets on the eRTL is within the EDB's expectation;

(c) instead of pursuing the quantity of e-textbooks on the eRTL, efforts are made to enhance the quality and the pedagogy with the use of e-textbooks; and

(d) schools are positive about the use of e-textbooks. From the regular meetings with the publisher associations and individual publishers' EOI, publishers have planned to submit more e-textbooks for review in the years ahead.

Audit considers that the EDB needs to, in consultation with the Steering Committee on Strategic Development of Information Technology in Education (see Note 8 to para. 2.8), determine the way forward and consider ways to facilitate the future development of e-textbooks.

Considerable number of schools used e-textbooks not on eRTL

3.8 One of the aims of EMADS was to draw up progressively a full-fledged eRTL similar to the RTL for printed textbooks (see para. 3.3(b)). According to the EDB, the quality of e-textbooks submitted for review would be subject to the quality assurance criteria derived from the experience in the vetting of printed textbooks. The eRTL has been published by the EDB since 2014/15. As at April 2018, there were 20 subject sets of which a total of 49 sets of e-textbooks were available on the eRTL (see Table 5 in para. 3.6).

3.9 In the annual school survey for 2016/17, schools were asked to indicate for each subject whether the e-textbooks they adopted were selected from the eRTL. A total of 666 schools (comprising 343 primary schools and 323 secondary schools)

responded to the survey. Audit analysed the schools that adopted e-textbooks for the three major subjects (i.e. Chinese Language, English Language and Mathematics) and found that the percentages of primary schools that adopted e-textbooks not on the eRTL ranged from 28% to 34%, and the corresponding percentages for secondary schools ranged from 45% to 48% (see Table 6).

Table 6

Percentage of schools that adopted e-textbooks not on eRTL (2016/17)

Subject	No. of primary schools			No. of secondary schools		
	Adopted e-textbooks (a)	Adopted e-textbooks not on eRTL (b)	Percentage (c) = (b) ÷ (a) × 100% (%)	Adopted e-textbooks (d)	Adopted e-textbooks not on eRTL (e)	Percentage (f) = (e) ÷ (d) × 100% (%)
Chinese Language	78	22	28%	27	13	48%
English Language	90	31	34%	25	12	48%
Mathematics	94	31	33%	31	14	45%

Source: *Audit analysis of EDB records*

Remarks: *Only schools that have indicated in the survey whether the e-textbooks they adopted are on the eRTL are included in this table.*

3.10 The RTL for printed textbooks was much better received by schools than the eRTL. Audit noted that:

(a) the review system for the RTL has a long history since 1972; and

(b) according to the report issued by the Task Force to Review Learning and Teaching Materials in December 2011:

(i) it was not a must for textbook publishers to submit their textbooks for review. Schools were free to select textbooks and learning materials that were not on the RTL for use. However, many schools regarded the review system as a quality assurance mechanism and would therefore select their textbooks according to the RTL. As a result, publishers considered it very important for their textbooks to pass the review and be included on the RTL; and

(ii) the Task Force was of the view that the textbook review system had worked well to help enhance the quality of textbooks. The RTL had enabled schools and teachers to select textbooks efficiently.

3.11 The EDB informed Audit that:

(a) many publishers of popular printed textbooks did not plan to submit the electronic version of the textbooks for review at the initial stage because of their business considerations;

(b) many schools were still exploring e-learning pedagogies with the use of printed textbooks, e-textbooks and other e-resources in accordance with their teachers' readiness, infrastructure and students' needs. It was observed that many schools tend to choose these not-yet-reviewed e-textbooks together with their printed version from the same publishers at this transitional period, regardless of whether the e-textbooks were on the eRTL or not; and

(c) the EDB has all along been promoting the use of eRTL to e-textbook developers and schools through various means and occasions including the following:

(i) briefings to textbook publishers on the submission of textbooks and e-textbooks for review;

(ii) meetings between the EDB and the textbook publishers' associations;

(iii) requiring schools to clearly indicate on the school textbook lists whether the textbooks and e-textbooks are on the RTL and eRTL respectively;

(iv) seminars for teachers on the selection of learning and teaching resources; and

(v) focus groups and try-outs on the use of e-textbooks on the eRTL.

3.12 Recognising that compared to the RTL, the eRTL is new and developing, Audit considers that the EDB needs to:

(a) continue to monitor the development of the eRTL, and promote the eRTL as a quality vetting and assurance mechanism for e-textbooks among e-textbook developers and schools; and

(b) encourage e-textbook developers to submit e-textbooks for review.

Audit recommendations

3.13 **Audit has *recommended* that the Secretary for Education should:**

(a) **in consultation with the Steering Committee on Strategic Development of Information Technology in Education, determine the way forward and consider ways to facilitate the future development of e-textbooks;**

(b) **continue to monitor the development of the eRTL;**

(c) **promote the eRTL as a quality vetting and assurance mechanism for e-textbooks among e-textbook developers and schools; and**

(d) **encourage e-textbook developers to submit e-textbooks for review.**

Response from the Government

3.14 The Secretary for Education generally agrees with the audit recommendations. He has said that:

(a) given that development and effective use of e-resources and e-textbooks is one of the six major actions under ITE4, the EDB has been constantly reviewing and fine-tuning the development of e-resources and e-textbooks in supporting learning and teaching in different subjects and will continue to seek advice on further development from the Steering Committee on Strategic Development of Information Technology in Education;

(b) the EDB will also continue to promote the use of e-textbooks in schools through various means, such as forming learning communities to strengthen pedagogies of using e-resources and e-textbooks, sharing of good practices in using e-textbooks in different subjects so as to encourage wider adoption of e-textbooks;

(c) the EDB has all along been identifying ways to rendering the eRTL more user-friendly. To facilitate schools to make reference to the eRTL when selecting learning resources, the EDB has been constantly fine-tuning the display format and the information included on the eRTL, e.g. the combination with the RTL of printed textbooks and the inclusion of more description about the e-textbooks for teachers' easy reference;

(d) the EDB has been making efforts to enhancing the quality of e-textbooks and the pedagogy with the use of e-textbooks in addition to encouraging the submission of more e-textbooks for review for inclusion on the eRTL; and

(e) it is observed that publishers show interest and have planned to submit more e-textbooks for review in the years ahead. A special task group has also been set up in June 2018 with the textbook publisher associations to discuss the development and usage of e-textbooks and the fine-tuning of the review requirements.

Procurement of e-learning resources

3.15 An e-learning resource is an electronic media which is used to facilitate learning and teaching, for example, Internet websites, mobile applications and digital learning materials. According to the views collected from the public consultation on ITE4, there was overwhelming support that the acquisition of more quality e-learning resources from local and overseas developers would provide teachers and students with more choices and was crucial for the success of IT in education. Of the $105 million earmarked for the implementation of ITE4, $10 million was granted to the HKECL for the e-Resource Acquisition Project (eREAP). eREAP aims at:

(a) enriching the pool of high quality and readily available e-learning resources for use by both teachers and students;

(b) establishing a mechanism to coordinate evaluation, acquisition and licensing of e-learning resources to support large scale implementation in Hong Kong; and

(c) lowering the overhead and achieving economy of scale for e-learning resources in the long run.

Procurement procedures of e-learning resources

3.16 eREAP commenced in January 2016 and would end at August 2019. The EDB signed a service agreement with the HKECL for eREAP, according to the agreement:

(a) the HKECL was responsible to source suitable e-learning resources for use by schools; and

(b) a Steering Committee of eREAP (Note 19) would be formed to oversee the implementation of eREAP, and establish the frameworks and guidelines of the e-learning resources acquisition.

Note 19: *The Steering Committee of eREAP was formed in January 2016. It comprised 10 members including school principals, school librarians and frontline teachers.*

3.17 The e-learning resources may be subject/level specific (e.g. English Language for primary schools) or cover more than one subject/level. According to the guidelines promulgated by the Steering Committee of eREAP, the procurement procedures of e-learning resources were as follows:

(a) ***Invitation for EOI.*** To identify potential quality e-learning resources, invitations for EOI were sent to local and overseas resource providers;

(b) ***Proposal evaluation.*** The proposed e-learning resources submitted by the resource providers which matched the selection criteria were shortlisted for evaluation by Evaluation Panels. Each Evaluation Panel comprised several frontline teachers (members of the Steering Committee of eREAP were welcome to join the Panel); and

(c) ***Tender.*** The providers who provided e-learning resources that were found suitable were invited to participate in the tender exercise. A Tender Evaluation Team was appointed by the Executive Director of the HKECL to evaluate the tenders submitted by the resource providers.

3.18 Two rounds of e-learning resource procurement exercises were conducted in the periods from April to November 2016 and from February to June 2017 respectively. Of the 128 e-learning resources proposals received, 8 passed the screening and were made available for schools' adoption in eREAP.

Need to determine the way forward for e-learning resource acquisition

3.19 Schools can use the e-learning resources under eREAP free of charge. They are required to renew their participation annually. A total of 205 schools participated in the first year of eREAP (i.e. 2016/17). Although there were new schools that joined eREAP in the second year, 46 (22%) of the 205 schools that joined in the first year did not participate in the second year.

3.20 The EDB informed Audit in October 2018 that:

(a) the main reasons for the schools' withdrawal from eREAP were the suitability of the e-learning resources to the schools and the schools' different priorities in learning and teaching;

(b) the HKECL had closely monitored the withdrawal cases and taken follow-up action, and reported to the Steering Committee of eREAP;

(c) although some schools had not renewed their participation, there was still a net increase of 16% (from 205 to 237 schools) in the number of schools joining eREAP in the second year (2017/18) which reflected the popularity of the project among schools;

(d) the eREAP scheme was a pilot scheme for schools to have an opportunity to try out local and overseas e-learning resources. Since eREAP was just one of the many e-learning resources available in the market, the e-learning resources from eREAP would by no means satisfy the needs of all different schools; and

(e) the project had shown good progress in lowering the purchase cost of e-learning resources. This pilot scheme was useful in collecting information for large scale implementation of e-learning resources acquisition in the future.

One of the aims of eREAP was to enrich the pool of high quality and readily available e-learning resources for use by teachers and students (see para. 3.15(a)). Audit considers that the EDB needs to, in collaboration with the HKECL, consolidate the experience gained from the implementation of eREAP with a view to improving eREAP and determining the way forward for e-learning resource acquisition.

Need to source more quality e-learning resources

3.21 In the two rounds of procurement exercise, eight e-learning resources were successfully sourced from four providers. Audit noted that while the e-learning resources procured covered various subjects including English Language, Mathematics and Liberal Studies, they did not cover Chinese Language. According to the EDB:

(a) the HKECL had already placed more emphasis on sourcing e-learning resources that were related to Chinese Language during the second round of the resource procurement exercise;

(b) the proposed Chinese Language e-learning resources submitted by providers received low scores in the quality and/or suitability for use in Hong Kong. As a result, there was still no Chinese Language e-learning resources available in eREAP; and

(c) eREAP is not the only form of e-learning resources available to schools. In fact, there are many free Chinese Language e-learning resources developed by the EDB or EDB funded projects.

3.22 In December 2017, the HKECL conducted a survey to collect the views from 66 participating schools of eREAP. According to the survey results, about 39% of the teachers from the 66 schools suggested that Chinese Language should be covered in eREAP and it was one of the three subjects suggested by most teachers (Note 20). Audit considers that the EDB needs to explore ways to source more quality e-learning resources in the market, in particular for Chinese Language.

Audit recommendations

3.23 **Audit has *recommended* that the Secretary for Education should:**

(a) **in collaboration with the HKECL, consolidate the experience gained from the implementation of eREAP with a view to improving eREAP and determining the way forward for e-learning resources acquisition; and**

(b) **explore ways to source more quality e-learning resources in the market, in particular for Chinese Language.**

Note 20: *The other two subjects that were suggested by most teachers to be covered in eREAP were Mathematics (about 41%) and English Language (about 39%).*

Response from the Government

3.24 The Secretary for Education generally agrees with the audit recommendations. He has said that:

(a) there is room for eREAP, as a pilot project, to improve. The main objective of eREAP was to establish a mechanism to coordinate evaluation, acquisition and licensing of e-learning resources to support large scale implementation in addition to enriching the pool of e-learning resources available for schools;

(b) the EDB considers that the project has shown good progress in lowering the purchase cost of e-learning resources via a bulk purchase mechanism. Besides, the HKECL has ongoing mechanism to monitor the use of e-resources by schools and report the progress and evaluation, including the needs and concerns of schools. The number of schools joining eREAP increased by 16% (from 205 schools to 237 schools) and the cost of e-learning resources acquired through the bulk purchase mechanism had been lowered in the second year (i.e. 2017/18);

(c) the EDB will assist the HKECL to take further measures to improve eREAP taking the experience gained into account and consider the way forward for e-learning resources acquisition; and

(d) the EDB will explore ways to source more quality e-learning resources in Chinese Language in the market. It should be noted that HKECL has tried their best in sourcing Chinese Language e-learning resources but in vain due to the lack of available e-learning resources in the market suitable for use in local schools as Hong Kong being a small market for Chinese Language and requires very localised contents. Apart from eREAP, there are many free Chinese Language e-learning resources from other sources, including those developed by the EDB or EDB funded projects.

Development of Online Integration Services Platform for e-textbooks and e-learning resources

3.25 The first batch of e-textbooks developed under EMADS was available for use by schools in 2014/15. In January 2014, the FC approved funding for various measures to support schools to adopt e-textbooks, including an amount of $10 million for the development of the OISP (see para. 1.8(g)(iii)) to link up schools' systems and the various online content platforms used by content providers. The OISP included two components aimed to improve user experience for both students and teachers by:

(a) ***Single Sign On (SSO).*** This component provides a one-stop account management for students, teachers and content providers; and

(b) ***EdBookshelf.*** This component serves as a common file exchange platform for delivery of e-textbooks and e-learning resources from content providers to students' network storage, and facilitates exchange of learning data (e.g. assessment data) between content providers and schools.

In March 2014, the EDB and the HKECL entered into an agreement for the development of the OISP. The OISP was launched in August 2014.

Need to encourage adoption of SSO and EdBookshelf by students and teachers

3.26 Without the OISP, students have to log in to various e-textbooks/e-learning resources systems separately to learn and/or to take on assessment tasks. Similarly, teachers have to log in to these individual systems to extract the learning data of their students. This creates much inconvenience to the students and the teachers. The OISP aimed to address this problem by a one-stop account management system. For example, users only need to log in through the SSO to EdBookshelf to gain access to all the e-textbooks and e-learning resources uploaded to EdBookshelf by various content providers. Each teacher member and student member of the HKECL can use

their own user account (Note 21) to log in EdBookshelf.

3.27 In the four-year period from 2014/15 to 2017/18, the total number of teacher members and student members of the HKECL as at the end of each school year ranged from 628,724 to 666,957. During the same period, the numbers of members using the SSO and EdBookshelf each year increased from 17,988 to 60,294 and 3,148 to 17,080 respectively (see Table 7). Notwithstanding the increase, there is still room to encourage more members to use SSO and EdBookshelf. Audit considers that the EDB needs to urge the HKECL to further promote the usage of the SSO and EdBookshelf among HKECL members.

Table 7

Usage of the SSO and EdBookshelf
(2014/15 to 2017/18)

No. of HKECL members at school year end	2014/15	2015/16	2016/17	2017/18
— teacher members (a)	65,120	66,906	71,358	77,469
— student members (b)	601,837	561,818	578,847	577,715
Total (c)=(a)+(b)	666,957	628,724	650,205	655,184
No. of active members (login at least once in the school year)	174,913	212,542	245,772	266,466
No. of members who used the SSO at least once during the school year	17,988	38,715	37,580	60,294
No. of e-books available at EdBookshelf as at year end	379	644	971	1,221
No. of members who used EdBookshelf at least once during the school year	3,148	10,747	10,791	17,080

Source: Audit analysis of HKECL records

Note 21: *The HKECL operates a public education website to provide information for teachers, students and parents. Schools can apply for memberships for their teachers and students. The HKECL will assign a unique user account to each teacher member and student member. At the beginning of each school year, school administrators will update the membership profile with the HKECL to assign accounts to new teachers and students, and remove accounts of resigned teachers and graduated students.*

Need to enhance usage of EdBookshelf by e-textbook publishers

3.28 One of the aims of EdBookshelf was to serve as a common file exchange platform for delivery of e-textbooks and e-learning resources from content providers to students' network storage (see para. 3.25(b)). Audit noted that during the development of EdBookshelf, meetings and briefing sessions were conducted for publishers (including those who had participated or were participating in EMADS), and schools and teachers to collect their feedback on the functionality of EdBookshelf. The HKECL also organised promotional events for e-textbook developers to publicise EdBookshelf. As at 30 June 2018, 1,221 e-books were available at EdBookshelf. However, none of the e-books were e-textbooks on the eRTL. According to the EDB:

(a) e-textbook developers were reluctant to put their e-textbooks on third-party systems, including EdBookshelf; and

(b) as the technology and publishing ecosystem evolve rapidly, the HKECL would continue to evolve its services in order to provide the best support to the industry.

Audit considers that the EDB needs to urge the HKECL to keep in view the challenges faced by and considerations of e-textbook developers and take measures to address their concerns where necessary with a view to enhancing the usage of EdBookshelf by e-textbook publishers.

Need to promote exchange of learning data

3.29 There are various types of e-books uploaded to EdBookshelf, including reference books for academic subjects, children books and leisure books. Some e-books contain interactive elements (such as exercises and quizzes in which users can take part) and learning data are generated (such as results of the exercises and quizzes).

3.30 To facilitate the exchange of learning data between content providers and schools, EdBookshelf allows content providers to enable a function to retrieve data from their e-books. However, as at 30 June 2018, of the 1,221 e-books uploaded to EdBookshelf by 38 content providers, only eight e-books developed by one content provider had the function of retrieving learning data from them enabled. According to the EDB, designing e-books with learning data analysis is a more advanced design and is more effective to facilitate learning which should be encouraged, but the EDB understands that publishers need to review their business model and make investment to develop functions like learning data analysis for embedded questions or quizzes, etc. in their e-books. Such functions will become more common when e-books become more popular and publishers identify a viable business model. Audit considers that the EDB needs to urge the HKECL to encourage content providers to enable the function of EdBookshelf to retrieve data from their e-books with a view to facilitating exchange of learning data between content providers and schools.

Audit recommendations

3.31 **Audit has *recommended* that the Secretary for Education should urge the HKECL to:**

(a) **further promote the usage of the SSO and EdBookshelf among HKECL members;**

(b) **keep in view the challenges faced by and considerations of e-textbook developers and take measures to address their concerns where necessary with a view to enhancing the usage of EdBookshelf by e-textbook publishers; and**

(c) **encourage content providers to enable the function of EdBookshelf to retrieve data from their e-books with a view to facilitating exchange of learning data between content providers and schools.**

Response from the Government

3.32 The Secretary for Education agrees with the audit recommendations. He has said that:

(a) the numbers of active users of SSO and EdBookshelf have significantly increased by 2.35 times and 4.4 times respectively over the past 3 school years which means both services are becoming more popular among schools. The EDB will assist the HKECL to take measures to further promote the usage of the services;

(b) despite the efforts of the HKECL in conducting different promotional and briefing events for publishers, it takes time for publishers to develop the e-textbooks market. E-textbook is new in publishing industry and the technology and publishing ecosystem will evolve rapidly. The EDB will assist the HKECL to consider appropriate measures to enhance the usage of EdBookshelf by e-textbook publishers;

(c) as mentioned in paragraph 3.30, learning data analysis is a more advanced function for e-books and it takes efforts for the publishers to review their business model in developing such functions. It would take time for the publishers to develop and adopt data exchange functions in their e-books; and

(d) the EDB will assist the HKECL to consider appropriate measures to encourage content providers to make use of the data exchange function of EdBookshelf.

PART 4: PROFESSIONAL DEVELOPMENT OF SCHOOL LEADERS AND TEACHERS

4.1 This PART examines the issues relating to professional development of school leaders and teachers provided by the EDB.

Professional development programmes

4.2 The IT in Education Section of the EDB organises professional development programmes (PDPs) to better equip school leaders (i.e. principals, middle management personnel and curriculum leaders) and teachers with the necessary knowledge and skills on the latest practice of e-learning (Note 22). Since the implementation of ITE4 in 2015/16, the EDB has classified the PDPs into five categories, namely e-Leadership series, e-Safety series, Pedagogical series, Subject-related series and Technological series. Various courses are provided under the five categories of PDPs and each course may run several times (each time is known as an event). In 2015/16 and 2016/17, the EDB organised 255 and 295 courses, and 452 and 438 events respectively.

4.3 Apart from the PDPs, the EDB provides on-site support services to individual schools through the IT in Education CoE Scheme. Under the IT in Education CoE Scheme, seconded teachers are selected from experienced frontline school leaders and teachers to provide training and on-site support services to schools on request for sharing of good practices and success experiences on IT in education. A total number of 337 and 278 on-site support services were provided to schools in 2015/16 and 2016/17 respectively.

Note 22: *According to the EDB, apart from the IT in Education Section, other sections of the EDB and outside bodies also organise other PDPs related to IT in education.*

Need to improve the award rate of certificate of some commissioned courses

4.4 PDP are provided in the following ways:

(a) courses organised by the EDB, including those conducted by seconded teachers under the IT in Education CoE Scheme and jointly organised with IT industry, relevant government departments and teacher associations, etc. These courses also included conferences held by local tertiary institutions and teacher associations; and

(b) courses commissioned to local tertiary institutions (i.e. service providers). The expenditures spent on such commissioned courses in financial years 2015-16 and 2016-17 were $3.5 million and $3.8 million respectively.

4.5 The EDB entered into separate contracts with the service providers for the provision of each commissioned course. A commissioned course may run a number of times (each time is known as an event). An event comprises two 3-hour sessions with more in-depth learning. The service providers will issue a certificate to each participant who:

(a) achieved full attendance; and

(b) submitted the course-related work within two weeks after the last session of the event.

4.6 According to the EDB:

(a) only some of the assignments would be selected to enhance discussion in the second session of each event, the submission of assignment would not affect the overall effectiveness of the commissioned courses. Hence, the award of the certificate is to serve as an incentive for full attendance and is not a prerequisite for attaining the Continuing Professional Development hours. The Continuing Professional Development hours would be awarded to participating teachers according to their attendance; and

(b) views of participating teachers collected from course evaluation meetings indicated that some participating teachers were too busy to attend all the sessions or submit their course-related work, and they were not very keen to obtain the certificate.

4.7 The certificate award rate of an event is the percentage of participants who fulfil the two required conditions (see para. 4.5). Audit analysed the certificate award rates of the commissioned courses conducted in 2015/16 and 2016/17. Audit noted that the rates of some events were not high. For instance, in many events the rate was not higher than 70% (i.e. not more than 70% of the participants having achieved full attendance and submitted course-related work before deadline). The percentage of events for commissioned courses with certificate award rate of more than 70% decreased from 74% (57 of 77 events) in 2015/16 to 61.6% (45 of 73 events) in 2016/17 (see Table 8). To enhance teachers' learning in training events, Audit considers that the EDB needs to take measures to improve the certificate award rate of the commissioned courses.

Table 8

Certificate award rate of commissioned courses (2015/16 to 2016/17)

Award rate	No. of events			
	2015/16		2016/17	
>40% to 50%	1 (1.3%)		3 (4.1%)	
>50% to 60%	3 (3.9%)		8 (11.0%)	
>60% to 70%	16 (20.8%)		17 (23.3%)	
>70% to 80%	23 (29.8%)		16 (21.9%)	
>80% to 90%	18 (23.4%)	57 (74.0%)	18 (24.6%)	45 (61.6%)
>90%	16 (20.8%)		11 (15.1%)	
Total	77 (100.0%)		73 (100.0%)	

Source: Audit analysis of EDB records

Need to timely disseminate materials of commissioned courses provided by service providers

4.8 According to the contracts between the EDB and the service providers of commissioned courses, the service providers are required to:

(a) video-tape the whole teaching processes of an event during the course; and

(b) compile all the course materials, including the video-tape of the whole teaching processes of an event, and develop a self-learning package for access by the public at the discretion of the EDB after completion of the course. A user guide, with descriptions and outlines of the course, should also be included for users' reference.

4.9 Audit noted that the EDB had received the materials of commissioned courses from the service providers as required by the contract but only made some of them available on the EDB webpages for access by the public. In response to Audit's enquiry, the EDB informed Audit that:

(a) the relevant terms in the contracts were amended in 2015/16 with the intention to request the service providers to submit a complete set of course materials to the EDB, but not intended for uploading all the materials to webpages for reference of the public; and

(b) most of the materials of the courses in both 2016/17 and 2017/18 had been uploaded on the website for reference of teachers.

In August 2018, Audit noted that the EDB had uploaded to its website materials of 14 of the 24 commissioned courses conducted in the period from 2015/16 to 2017/18. The materials of the remaining 10 (i.e. 24 – 14) commissioned courses had not been uploaded. Audit considers that the EDB needs to take measures to ensure timely dissemination of the materials of commissioned courses for access by the teachers (e.g. for teachers who could not attend the courses due to urgent school duties, or teachers who could not successfully enrol on the courses due to over-subscription) where appropriate.

Audit recommendations

4.10 **Audit has *recommended* that the Secretary for Education should take measures to:**

(a) **improve the certificate award rate of the commissioned courses; and**

(b) **ensure timely dissemination of the materials of commissioned courses for access by the teachers where appropriate.**

Response from the Government

4.11 The Secretary for Education generally agrees with the audit recommendations. He has said that:

(a) the EDB will consider measures to improve the certificate award rate of the commissioned courses; and

(b) materials appropriate for reference of teachers have been constantly uploaded to relevant webpages of the EDB website and most of the materials of the courses in 2016/17 and 2017/18 have been uploaded. Nonetheless, the EDB will explore measures to further disseminate the materials of commissioned courses to benefit more teachers.

PART 5: MONITORING OF IMPLEMENTATION OF IT IN EDUCATION

5.1 This PART examines the issues relating to the EDB's efforts in monitoring the implementation of IT in education. Audit found room for improvement in the following areas:

(a) annual school survey on progress of implementation of IT in education (paras. 5.2 to 5.8); and

(b) evaluation of progress of implementation of IT in education (paras. 5.9 to 5.12).

Annual school survey on progress of implementation of IT in education

5.2 The IT in Education Section of the EDB is responsible for the monitoring of e-learning initiatives for enhancing learning and teaching effectiveness in primary, secondary and special education. To capture information on the outcomes and fine-tune the implementation of IT in education, the EDB collects information through various means, e.g. school visits, on-site support, surveys and case studies to examine the changes resulting from the implementation and to identify support measures as appropriate. Since 2015/16, the EDB has conducted annual school surveys covering public sector schools and DSS schools to obtain a holistic understanding of the implementation of IT in education. The annual school surveys collect information from schools on their progress of implementing IT in education covering aspects such as schools' IT environment and infrastructure and the use of e-resources for learning.

Need to follow up with schools that did not respond to the annual school surveys

5.3 In 2016/17, there were 907 public sector schools (comprising 65 government schools, 780 aided schools, 2 caput schools and 60 special schools) and 82 DSS schools. The EDB issued the annual school survey to 984 of the 989

schools (Note 23). According to the EDB, it has made efforts in chasing schools for achieving a higher response rate by reminding schools using e-mails and phone calls.

5.4 Audit noted that of the 984 schools covered in the survey for 2016/17, 715 (72.7%) schools replied while 269 (27.3%) did not respond to the survey. Audit's further analysis revealed that of the 269 schools which did not respond to the annual school survey, 187 (69.5%) also did not respond to or were not covered by the preceding survey for 2015/16 (Note 24). The EDB informed Audit that apart from chasing the schools for their returns, it also made cross-reference to the general findings of Curriculum Development Visits (Note 25) and school inspections (Note 26) conducted by other sections of the EDB to generate a more holistic understanding of schools' progress of implementation of the IT in education. Audit noted that the results of Curriculum Development Visits and school inspections are not specifically designed for collecting information on implementation of IT in education, thus the information therein was very limited as compared to the information that the annual school survey sought to collect. Although the EDB considered that the current response rate was statistically good enough to reflect the situations in schools, Audit considers that omitting schools that decided not to respond to the survey may have bearing on the survey results. The EDB needs to step up efforts to follow up with schools that did not respond to the annual school survey as far as practicable.

Note 23: *The EDB did not send the annual school survey to five schools (comprising three DSS schools and two aided schools) due to reasons such as school closure during 2016/17.*

Note 24: *In conducting the annual school survey for 2015/16, the EDB covered 961 schools, including the 100 schools under the WiFi-100 Scheme and 861 schools which had expressed interest to join the WiFi-900 Scheme at the time of conducting the survey.*

Note 25: *Every year, the Curriculum Development Institute of the EDB conducts Curriculum Development Visits covering the implementation of curriculum in schools on a range of curriculum areas including e-learning.*

Note 26: *Every year, the Quality Assurance Section of the EDB conducts school inspections on selected public sector schools and DSS schools to review school's development at the whole school or Key Learning Area/subject levels.*

Some schools were behind their targets in implementing e-learning

5.5 Audit examined the annual school survey conducted for 2016/17 and noted that:

(a) of the 715 schools that responded to the survey, 56 (7.8%) indicated that their progresses on implementing e-learning were behind the targets set in their three-year School Development Plans; and

(b) for the 56 schools that were behind targets, the EDB had not:

(i) ascertained why their progresses were behind targets; and

(ii) explored whether these schools would need any assistance from the EDB to help them catch up with the progress.

5.6 The EDB informed Audit that:

(a) the purpose of the survey was for a holistic understanding of the implementation of ITE4 in order to fine-tune the actions and identify further support measures instead of identifying individual schools for follow up;

(b) schools were comparing their annual progresses with their own plans, and it did not necessarily mean that they had difficulties or under-performance in e-learning;

(c) under the principle of school-based management, it was at the discretion of individual schools to determine their own pace of e-learning having regard to their school circumstances and development needs; and

(d) the EDB played a supporting and advisory role to facilitate schools to implement e-learning in accordance with their school-based e-learning development plans. Schools were informed of the available IT in Education CoE on-site support services through relevant briefing sessions, the Circular Memorandum on school-based support services issued by School-based Professional Support Section as well as the website of the IT in Education Section.

Audit considers that the EDB needs to keep in view schools which considered their progresses of implementing e-learning behind the targets set in their School Development Plans, and proactively offer timely advice and assistance to them where necessary.

Audit recommendations

5.7 **Audit has *recommended* that the Secretary for Education should:**

(a) **step up efforts to follow up with schools that did not respond to the annual school survey as far as practicable; and**

(b) **keep in view schools which considered their progresses of implementing e-learning behind the targets set in their School Development Plans, and proactively offer timely advice and assistance to them where necessary.**

Response from the Government

5.8 The Secretary for Education agrees with the audit recommendations. He has said that:

(a) the EDB has been making intensive efforts in encouraging schools to complete and return the survey through various means including e-mails and telephone calls, thus increasing the response rate to 72.7%, which is considered statistically good enough to generate holistic understanding of the implementation of ITE4 in schools. The EDB will explore measures to further enhance the response rate in future surveys; and

(b) schools with progresses in implementing e-learning behind targets set by themselves are not necessarily having difficulties or are under-performing. They might have set too unrealistic targets or might have to adjust their progresses taking students' reception into account. Under the principle of school-based management, it is at the discretion of individual schools to determine their own pace having regard to their school circumstances and development needs.

Evaluation of progress of implementation of IT in education

5.9 Targets on implementation of e-learning were set in schools' Annual School Plans. Based on the school targets, the school works out its evaluation methods. The school then implements the plan, monitors progress of work and conducts evaluation on effectiveness during the school year. According to the EDB:

(a) a web-based Resource Pack providing referenced evaluation tools were put on the website of IT in Education Section till the end of 2016;

(b) since 2015/16, the EOI form, which was purposefully designed to serve as a checklist for schools' reference in formulating and evaluating their own e-learning development plans, has been available on the website;

(c) apart from tools provided by the EDB, schools are also encouraged to make use of school-based evaluation tools to serve their specific needs; and

(d) good practices with examples of e-learning development plans of various schools shared during relevant e-Leadership PDPs are also uploaded to the website from time to time.

Diverse evaluation methods were adopted by schools

5.10 Audit examined the 2017/18 Annual School Plans of 20 schools and found that diverse evaluation methods were adopted by schools to review their progresses of implementing IT in education (see Table 9). While recognising that different schools may use different evaluation tools specific to them, it would be conducive to improving the self-evaluation of schools if the EDB enhances the assistance provided to schools to facilitate their development of evaluation tools. The EDB needs to keep in view the evaluation tools used by schools in self-evaluation on the progress of implementing IT in education and, where necessary, provide assistance to schools to facilitate them in devising effective evaluation tools.

Table 9

Diverse evaluation methods adopted by 20 schools to review their progresses of implementing IT in education (2017/18)

Evaluation method	School	
	Number	Percentage
Collect teachers' feedback by survey	16	80%
Collect students' feedback by survey	8	40%
Collect parents' feedback by survey	1	5%
Examine teachers' training records	2	10%
Examine students' training records	4	20%
Conduct class visits and observations	5	25%
The downtime of the school's computer network	1	5%
Target achievement rate of eye care exercises	1	5%
The number of in-school sharing sessions on IT in education	1	5%
The percentage of students saving their homework in cloud platform	1	5%
Students academic performance	1	5%
Journal of e-learning in classes	1	5%

Source: Audit research

Remarks: The numbers and percentages of schools do not add up because one school may adopt more than one evaluation method.

Audit recommendation

5.11 **Audit has *recommended* that the Secretary for Education should keep in view the evaluation tools used by schools in self-evaluation on the progress of implementing IT in education and, where necessary, provide assistance to schools to facilitate them in devising effective evaluation tools.**

Response from the Government

5.12 The Secretary for Education generally agrees with the audit recommendation. He has said that while the EDB has already been providing various online resources and PDPs to schools to assist them in devising their own e-learning development plans, the EDB will consider whether there are other measures that can be put in place to facilitate schools in devising effective self-evaluation tools on the progress of implementing IT in education.

Appendix A
(para. 1.3 refers)

Programmes and outcomes of ITE1 to ITE3
(1998/99 to 2013/14)

Programme	Funding ($ million)	Outcomes as reported by the EDB
ITE1 (covering 1998/99 to 2002/03)		
(a) Provision of multimedia computers to all government and aided primary schools	253	<u>IT infrastructure and technical support</u> - The average number of computers installed in primary and secondary schools were 91 and 247 respectively (respective targets were 40 and 82). - Broadband connection to the Internet was established in all schools. - Over 60% of schools surveyed had intranet or learning management system. - All teachers had completed basic level IT training and 77% of them had completed intermediate level or above. <u>Learning and teaching</u> - 20 schools in various districts were identified as IT in Education Centres of Excellence to form a network schools for advising establishment of IT infrastructure, teacher training and integration of IT in curriculum. - The Hong Kong Education City Limited was established in 2000 to serve and promote quality education and IT for lifelong and life-wide learning. - More than 20,000 digital curriculum resources were produced to cater for schools' needs. <u>Parents and community support</u> - Expositions, competitions, awards and training for students and teachers were held to promote the use of IT in education, in collaboration with schools, professional bodies and private companies.
(b) Establishment of IT Learning Centres in all prevocational and secondary technical schools and acquisition of computer equipment and software packages for these Centres	46	
(c) Enhancement of IT facilities in public sector schools	2,583	
(d) Provision of additional training places and development of self-learning packages for teachers, and provision of computers and Internet access in community facilities	341	
Total	3,223	

Programme	Funding ($ million)	Outcomes as reported by the EDB
ITE2 (covering 2003/04 to 2006/07)		
(a) Replacing and upgrading of IT facilities in schools	171	<u>IT infrastructure and technical support</u> - The Composite Information Technology Grant was formed by combining four IT-related recurrent grants for disbursement to schools to increase schools' flexibility in using IT-related funding. - E-leadership trainings, professional development programmes and symposium were held to foster school personnel's capability to implement IT in education in schools. <u>Learning and teaching</u> - Most schools had established e-learning platforms. - Through the platform on the Hong Kong Education City Limited, learning and teaching materials, e-learning products, showcases and examples of good practices were available for teachers. - 21 schools were invited to be the Centres of Excellence and organised into focus groups to promote good practices in using IT in teaching. <u>Parents and community support</u> - Call centres and skill based IT courses were offered to IT technical staff and teachers. - About 10,000 families benefited from the Computer Recycling Scheme.
(b) Empowering learners with IT	13	
(c) Empowering teachers with IT	25	
(d) Enhancing school leadership for the knowledge age	9	
(e) Enriching digital resources for learning	40	
(f) Improving IT infrastructure and pioneering pedagogy using technology	6	
(g) Providing continuous research and development	10	
(h) Promoting community-wide support and community building	62	
Total	336	

Programme	Funding ($ million)	Outcomes as reported by the EDB
ITE3 (covering 2007/08 to 2013/14)		
(a) Replacing and upgrading of IT facilities in schools	200	<u>IT infrastructure and technical support</u> - Schools were basically well equipped, and classrooms were equipped with basic devices and network to support learning and teaching. - In addition to technical support staff, the central technical support team provided extra support to schools to troubleshoot technical problems. <u>Learning and teaching</u> - The Depository with resources of primary and secondary levels had been set up at the Hong Kong Education City Limited. More than 100 schools had tried out and more than 340 seminars were conducted. - Through professional development programmes, over 70% of respondent teachers were confident in using IT for learning and teaching. - Some degree of readiness towards student-centred learning was noted. <u>Parents and community support</u> - Parents' information literacy and awareness were enhanced through hotline and seminars, and over 98% of participants were satisfied with the contents for guiding their children to use IT at home.
(b) Providing a depository of curriculum-related teaching modules with appropriate digital resources	25	
(c) Continuing to sharpen teachers' IT pedagogical skills	- (Note 1)	
(d) Assisting schools to draw up and implement school-based IT in education development plan	- (Note 1)	
(e) Enabling schools to maintain effective IT facilities	3	
(f) Strengthening technical support to schools and teachers	5	
(g) Raising parents' information literacy	5	
(h) Continuing the Computer Recycling Programme	- (Note 2)	

Programme	Funding ($ million)	Outcomes as reported by the EDB
(i) Enhancing students' information literacy	2	
(j) Strengthening and expediting the development of the Depository of Curriculum-based Learning and Teaching Resources	12	
Total	252	

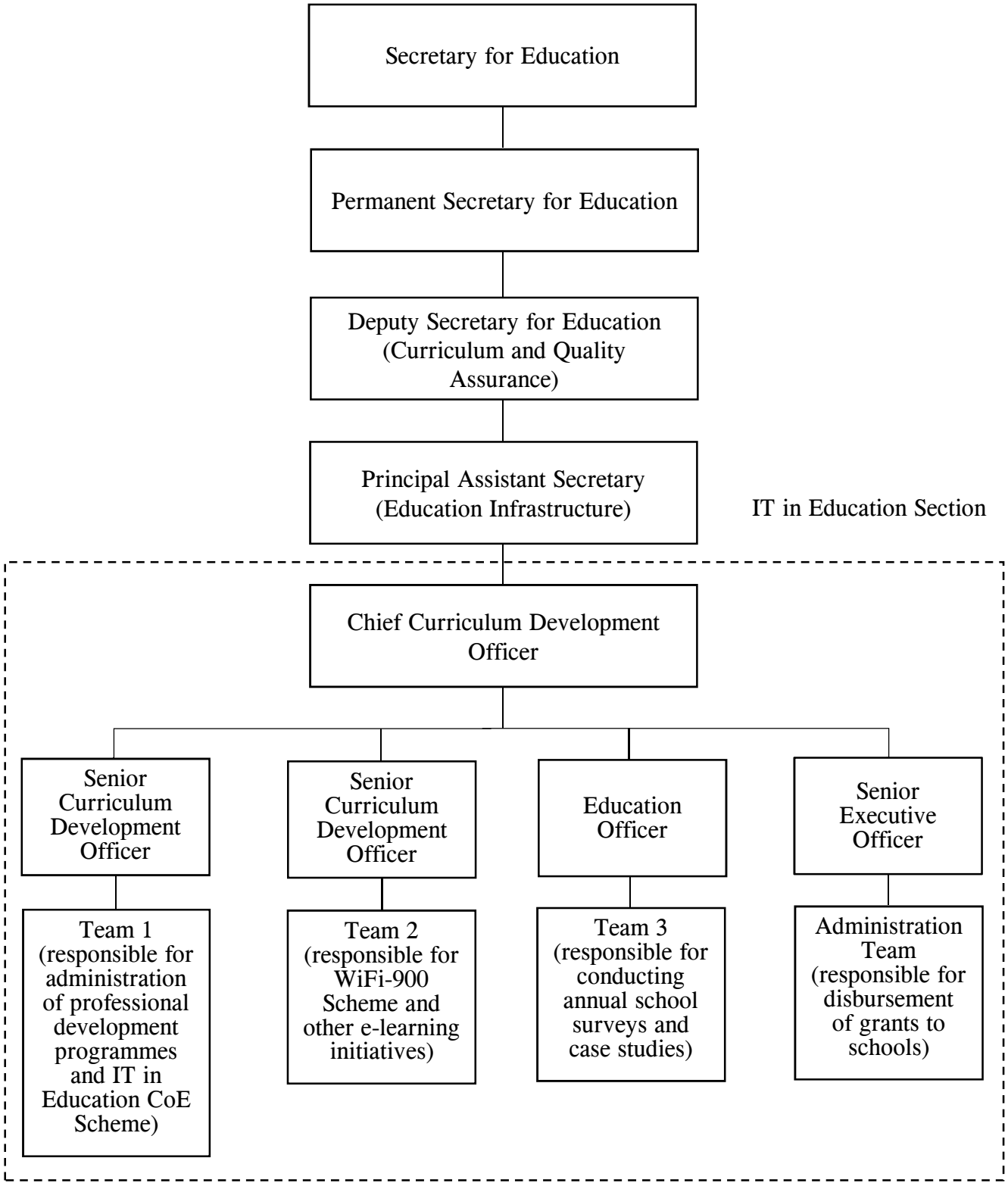
Source: EDB records

Note 1: The relevant expenditure was absorbed by the EDB.

Note 2: The programme in ITE3 used the unspent provision of ITE2.

Appendix B
(para. 1.9 refers)

EDB: Organisation chart (extract)
(31 March 2018)



Source: EDB records

Appendix C
(para. 3.5 refers)

Results of EMADS
(October 2018)

Key Stage	Subject sets with e-textbooks developed	Subject sets without e-textbooks developed
1	1. Chinese Language (2) 2. English Language (1) 3. Mathematics (1) 4. Putonghua (2) 5. General Studies (2) 6. Physical Education (1)	1. Music 2. Visual Arts
2	7. Chinese Language (2) 8. English Language (1) 9. Mathematics (1) 10. Putonghua (2) 11. General Studies (2) 12. Physical Education (1)	3. Music 4. Visual Arts
3	13. Chinese Language (1) 14. English Language (1) 15. Mathematics (2) 16. Computer Literacy (3) 17. Geography (4) 18. History (2) 19. Life and Society (3)	5. Putonghua 6. Science 7. Design and Technology 8. Home Economics 9. Religious Education 10. Chinese History 11. Physical Education 12. Music 13. Visual Arts
4	Nil	14. English Language 15. Biology 16. Chemistry 17. Physics 18. Geography 19. History

Source: EDB records

Remarks: The number in bracket represents the number of e-textbook sets developed for the subject.

Acronyms and abbreviations

Audit	Audit Commission
CITG	Composite Information Technology Grant
CoE	Centre of Excellence
DSS	Direct Subsidy Scheme
EDB	Education Bureau
EMADS	E-textbook Market Development Scheme
EOI	Expression of Interest
eREAP	e-Resource Acquisition Project
eRTL	Recommended Textbook List for e-textbooks
FC	Finance Committee
HKECL	Hong Kong Education City Limited
IT	Information Technology
ITE1	First Strategy on Information Technology in Education
ITE2	Second Strategy on Information Technology in Education
ITE3	Third Strategy on Information Technology in Education
ITE4	Fourth Strategy on Information Technology in Education
ITSSG	Information Technology Staffing Support Grant
LegCo	Legislative Council
OISP	Online Integration Services Platform
PDP	Professional development programme
QEF	Quality Education Fund
RTL	Recommended Textbook List
SSO	Single Sign On