

**For discussion  
on 10 January 2014**

**FCR(2013-14)50**

## **ITEM FOR FINANCE COMMITTEE**

**Head 156 – GOVERNMENT SECRETARIAT :  
EDUCATION BUREAU**

**Subhead 700 General non-recurrent  
New Item “Supporting Schools to Adopt E-textbooks”**

**CAPITAL WORKS RESERVE FUND**

**HEAD 710 – COMPUTERISATION**

**Government Secretariat : Education Bureau**

**New Subhead “Upgrading the Web-based School Administration and Management System”**

Members are invited to approve the following –

- (a) the creation of a commitment of \$50 million under Head 156 Government Secretariat : Education Bureau Subhead 700 General non-recurrent for supporting schools in adopting e-textbook; and
- (b) the creation of a commitment of \$67 million under Capital Works Reserve Fund Head 710 Computerisation for upgrading the Web-based School Administration and Management System.

### **PROBLEM**

We need to enhance the information technology (IT) infrastructure of schools to help them improve learning and teaching through new technologies, as well as to enhance the operational efficiency of schools.

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**PROPOSAL**

2. The Secretary for Education (SED) proposes to create –
  - (a) a commitment of \$50 million to support public sector schools (including government, aided and caput schools) and local schools under the Direct Subsidy Scheme (DSS schools) in adopting e-textbooks; and
  - (b) a commitment of \$67 million to replace and upgrade the Web-based School Administration and Management System (WebSAMS) servers and related system software in public sector and DSS schools, and to enhance the WebSAMS application programs to ensure the upgraded system will continue to function properly under the new platform.

**JUSTIFICATION****Supporting Schools to Adopt E-textbooks***Need for support for schools*

3. The first batch of e-textbooks which are being developed under Phase I of the e-Textbook Market Development Scheme (EMADS)<sup>1</sup> will be available for use in schools in the 2014/15 school year. The e-textbooks contain multi-media learning objects and interactive functions which facilitate students' understanding, self-directed and collaborative learning, and use of new pedagogy by teachers. To facilitate the effective use of e-textbooks in class, mobile computing devices (laptop or tablet computers) which display the main content of the e-textbook including media-rich materials such as videos are required. Until the "bring your own device" approach becomes more common, groups of two to three students are to share a device. This student-to-device ratio is considered sufficient to carry out technology-dependent activities such as Internet search, downloading worksheets, collaborative learning, etc.

4. The mobile computing devices should be connected to the school network and the Internet via WiFi connectivity, so that students can utilise the electronic features of e-textbooks which require Internet access and instantly search for information from the Internet. Schools intending to use e-textbooks should

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<sup>1</sup> To encourage potential and aspiring e-textbook developers to develop e-textbooks in line with the local curricula and to try out quality vetting and assurance mechanism for e-textbooks with a view to drawing up a Recommended Textbook List for e-textbooks, the Administration launched EMADS with a non-recurrent commitment of \$50 million approved by the Finance Committee vide FCR(2012-13)35 for providing seeding grants to successful non-profit making e-textbook developers.

have access to a stable and secure WiFi connection with reasonable bandwidth. At present, most schools do not have sufficient WiFi coverage<sup>2</sup> and sufficient mobile computing devices for using e-textbooks effectively in class. Besides, with the emerging pedagogical practices for e-learning, there is a need for intensive professional development for teachers and school leaders for whole school implementation of e-learning through the use of e-textbooks.

5. At the back end, schools should also have a pedagogically sound learning management system (LMS) for managing learning resources and activities, delivery of learning content, engaging students in assessment tasks, etc. At present, most public sector and DSS schools have some form of LMS operating within their school network but the LMS is not optimally utilized because the e-learning resources/services platforms are detached from the schools' LMS. As such, students have to log in to various e-textbook/e-learning resources/services 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 students and teachers as they have to remember an array of login names and passwords to access different e-learning resources/services systems. E-learning resource providers also have to create and manage large number of student accounts. The problem will become more serious when schools increasingly adopt e-textbooks and e-learning resources. There is an imminent need for an online integration platform to link up schools' LMS and various e-textbooks/e-learning resources platforms so that the online integration platform could perform the account management functions for students, teachers, schools and e-learning resource providers.

### *Proposed support measures*

6. To support schools which are planning to use e-textbooks in the 2014/15 school year, we propose launching a scheme under which about 100 public sector and DSS schools (to be selected based on the criteria in paragraph 17 below) will be provided with a one-off grant to enhance or top up their IT infrastructure so

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<sup>2</sup> According to our recent study and surveys, including (a) Review Surveys of the Third Strategy on Information Technology in Education (December 2012) conducted by the Hong Kong Institute of Education; and (b) Surveys on IT in Education (January 2012 and July 2013) conducted by the Education Bureau to collect schools' views on e-learning and other relevant data related to IT in education, all schools have equipped their classrooms with a desktop computer connected to the Internet and a projector, a basic learning management system (LMS) and some of them have enough mobile computing devices for shared use in some classes. However, less than 10% out of some 1 000 public sector and DSS schools are sufficiently equipped with WiFi connectivity in classroom to effectively use e-textbook.

as to set up the necessary WiFi environment in their school premises for use of e-textbooks in class and to acquire sufficient mobile computing devices (an average of 50 devices which should be sufficient for use on a two or three students to one device ratio for one level of students). We are providing funding support for schools to acquire mobile learning devices at this stage because the “bring-your-own-device” approach, which is common in the local tertiary sector and in overseas, is not yet common in the local school sector. These schools will act as change agent on the WiFi infrastructure buildup process and other value-added services. They will be expected to share their lessons learnt with other schools and to set up relevant community of practice among teachers to disseminate the pedagogical experience.

7. In line with the current practice for disbursement of the Composite IT Grant, the rate of grant for schools will be commensurate with the number of classes. Each school will receive a one-off grant in the range of \$242,500 to \$606,400.

8. To ensure the necessary WiFi environment is built on time for enabling the use of e-textbooks developed under EMADS, technical and project management support will be centrally arranged by the Education Bureau (EDB) for servicing these schools. The services will include technical advice on the design of the WiFi infrastructure and monitoring the work of service providers.

9. To help teachers establish sound pedagogy for using e-textbooks, we will also provide intensive and tailor-made professional development programmes for beefing up their knowledge and skills on e-learning. The professional development programmes will also aim to build up intra-school community of practice to scale up whole-school adoption of e-textbooks in the long run. It is envisaged that over time, a critical mass of teachers with higher IT-readiness will be available to facilitate the territory-wide adoption of e-textbooks and e-learning.

10. With regard to the LMS of schools, we propose developing an online integration services platform to link up schools’ LMS and the various online content platforms now used by e-learning resources providers to improve user experience for both students and teachers. This integration platform will provide one-stop account management for both users and e-learning resources providers, serve as a common file exchange platform for delivery of digital learning materials including e-textbooks from e-learning resources providers to students’ network storage, and facilitate exchange of learning data (e.g. assessment data) between content providers and schools.

11. The online integration services platform will be developed and operated by the Hong Kong Education City Limited<sup>3</sup> (HKECL) which has the edge of having a robust platform providing services to the education community for over a decade and holds the largest membership of student and teacher users.

## **Upgrading of WebSAMS**

### *Need for system enhancement*

12. The WebSAMS is a web-based application system developed by EDB to provide all public sector schools, as well as DSS schools, with a networked computer system to assist in their administration and management processes. It is operating under the basic operating system software of Windows Server 2003, which is going to be de-supported by the service provider in July 2015. We need to upgrade the system software as well as the accompanying hardware to allow WebSAMS to be operated under an up-to-date system software of Windows Server 2012 which will continue to be supported by the service provider. This is to ensure that the WebSAMS, which contains personal information of students, parents and teaching staff, would not be susceptible to security risks and instabilities and to uphold the performance level and compatibility of the system.

13. Since the rollout of the WebSAMS, there has been a continuous increase in the usage of the system among schools. To cater for the needs of schools, various enhancements have been made to the functions of the system, like automation of submission of applications for student textbook and travel allowance to the Student Financial Assistance Agency (SFAA), the electronic submission of school calendar to EDB, the generation of analysis reports on student performance across school years and the production of annual leave records for teaching staff. These extra functions have added extra loading to the WebSAMS. As such, more processing power will be required to sustain the future growth of the WebSAMS in support of the new business requirements and enhancements in the school sector.

### *Proposed upgrading of WebSAMS*

14. We propose replacing and upgrading the WebSAMS servers and related system software, and enhancing the WebSAMS application programs to ensure that the upgraded system will continue to function properly under the new platform. After the upgrade, the new system will have additional capacity to meet the new business requirements of the school sector.

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<sup>3</sup> The HKECL was set up in 2002 as a wholly owned company of the Government of HKSAR for serving the education sector with, among others, a public education portal to provide education related information, resources, online services and to facilitate community building for teachers, students and parents. It has maintained the unique largest membership database of local students and teachers.

15. The proposed upgrading project will comprise two main parts: acquisition of hardware and system software by schools, and enhancement of the WebSAMS application programs centrally arranged by EDB. To provide schools with greater flexibility in procuring the computer equipment and arranging the system migration in accordance with their own schedule, each eligible school will be provided with a one-off grant of \$50,000. We will provide schools with the required technical specifications for reference and will offer assistance/support to schools throughout the upgrading exercise.

16. We expect the system upgrading of WebSAMS to bring about enhanced productivity whereby all tasks currently performed will be handled more efficiently and in a more secure manner. Although these benefits being scattered in some 1 000 schools cannot be realized in form of actual staff savings, the time and efforts of school staff thus saved can be diverted to other areas conducive to learning and teaching. A cost and benefit analysis for the proposed upgrade is at Enclosure 1.

Encl. 1

## **IMPLEMENTATION PLAN**

### **Supporting Schools to Adopt E-textbooks**

17. Subject to the funding approval of the Finance Committee (FC), we plan to invite public sector and DSS schools to apply for participation in the scheme for enhancement of IT infrastructure to adopt e-textbooks in mid-January 2014. Applicants will be required to formulate a three-year e-learning development plan, based on which EDB will assess their readiness and suitability for joining the scheme. Their e-learning development plan should include, but not limited to, the following areas –

- (a) Details and schedule for adoption of e-textbooks;
- (b) Curriculum planning with implementation details;
- (c) Engagement of parents and/or other stakeholders;
- (d) Detailed plan for IT infrastructure enhancement; and
- (e) Detailed plan for professional development of teachers in e-learning.

Other factors to be considered include the applicants' track record on IT in education and e-learning. Existing IT infrastructure in schools will also be considered. Successful applicants will be informed of the outcome and provided with the cash grant by end-March 2014. Unused grant after the three-year period at the end of the 2016/17 school year will be clawed back. The infrastructure buildup, support services and intensive teacher professional development programmes will begin in April 2014.

18. HKECL will kick-start the development of the online integration services platform in January 2014 and will deliver the services in two phases. Phase I covering single-sign-on service, common learning platform for students and content updating mechanism will be completed by the third quarter of 2014. Phase II covering the support of more industry standards in digital publishing, exchange of learning data and capacity to support large scale implementation will be completed by the second quarter of 2015.

### Upgrading of WebSAMS

19. The one-off grant for enhancing the WebSAMS will be disbursed to schools in mid-2014. They may spend the grant across years for the acquisition of the WebSAMS hardware servers, system software and system migration, no later than the end of 2015. The progress of system upgrading will be monitored and any unspent provisions after the end of 2015 will be clawed back from schools. During the upgrading process, we will ensure a smooth switchover with minimum disruption to the operation of schools. The enhancement of the WebSAMS application programs will be centrally arranged by EDB. The new version of the WebSAMS application programs will be rolled out and distributed to schools in mid-2014 for deployment under the new platform.

## FINANCIAL IMPLICATIONS

### Supporting Schools to Adopt E-textbook

20. The proposed supporting measures for schools to adopt e-textbooks will involve a non-recurrent funding of \$50 million, with breakdown and estimated cash flow as follows –

<b>Expenditure item</b>	<b>2013-14 \$'000</b>	<b>2014-15 \$'000</b>	<b>2015-16 \$'000</b>	<b>Total \$'000</b>
(a) One-off grant to schools for subscription of WiFi services and acquiring mobile computing devices	35,000	–	–	35,000
(b) Development of online integration services platform by HKECL	10,000	–	–	10,000
(c) Provision of professional development programmes for teachers	–	1,000	1,000	2,000

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<b>Expenditure item</b>	<b>2013-14 \$'000</b>	<b>2014-15 \$'000</b>	<b>2015-16 \$'000</b>	<b>Total \$'000</b>
(d) Provision of technical and programme management support services for schools	–	1,500	1,500	3,000
<b>Total</b>	<b>45,000</b>	<b>2,500</b>	<b>2,500</b>	<b>50,000</b>

### Upgrading of WebSAMS

#### *Non-Recurrent Expenditure*

21. The proposed upgrading of the WebSAMS will give rise to non-recurrent expenditure of about \$67 million over two years from 2014-15 to 2015-16, of which \$50 million will be required for one-off grant to schools for acquisition of hardware and software by schools (\$50,000 per school for 1 000 schools). The balance of about \$17 million will be for EDB to enhance the WebSAMS application programs, procure support services for schools during the implementation process and procure some of the systems software for schools.

22. The estimated cashflow is as follows –

<b>Expenditure item</b>	<b>2014-15 \$'000</b>	<b>2015-16 \$'000</b>	<b>Total \$'000</b>
(a) Acquisition of computer servers	29,100	900	30,000
(b) Acquisition of computer software	21,500	500	22,000
(c) Acquisition of system migration services	5,000	–	5,000
(d) Acquisition of WebSAMS implementation services	4,000	–	4,000
(e) Hiring of contract staff to provide technical support services	3,000	3,000	6,000
<b>Total</b>	<b>62,600</b>	<b>4,400</b>	<b>67,000</b>



23. The expenditure in paragraph 22(a) is for the acquisition of computer servers for some 1 000 schools.

24. The expenditure in paragraph 22(b) is for the acquisition of computer software, including system operating software, database management system, reporting tool, system backup tool and anti-virus software for the servers in schools.

25. The expenditure in paragraph 22(c) is for the acquisition of services for schools to migrate the WebSAMS, including the computer application software and the data, to the new servers.

26. The expenditure items under paragraphs 22(a) to (c) will be disbursed to schools as one-off grant, except for \$7 million under paragraph 22(b) for some systems software which will be centrally procured by EDB.

27. As regards paragraph 22(d), the estimated expenditure is for the acquisition of services by EDB to modify the WebSAMS application programs to suit the new system environment.

28. As regards paragraph 22(e), the estimated expenditure is for hiring of contract staff by EDB to provide technical support and monitor the implementation of the project.

#### ***Other Non-recurrent Expenditure***

29. The proposed upgrading of the WebSAMS will entail an additional non-recurrent staff cost of \$4,859,000. The cost represents a total of 55.5 man-months of Education Officer (Administration) and Analyst/Programmer grades staff for managing the project and providing support to schools, and 26 man-months of clerical staff for administration support. This will be absorbed by EDB from within its existing resources.

#### ***Recurrent Expenditure***

30. As the proposed upgrading of the WebSAMS is a replacement project, the additional recurrent financial implication is insignificant because the recurrent cost of maintaining the new system is almost the same as the cost of maintaining the existing system. We will deploy the existing recurrent resources used on maintaining the WebSAMS to meet the recurrent requirements in support of the upgraded system.

**PUBLIC CONSULTATION**

31. We have consulted stakeholders including IT associations, school councils and teachers associations; as well as the respective steering committees on EMADS and the development of IT in Education towards our proposed measures in supporting schools to adopt e-textbooks. They are in general positive towards our proposed measures and have made a lot of constructive comments on the operational details such as the selection mechanism for the 100 schools. We will take into account their opinions in finalizing the operational details of the proposed measures. We also consulted the Panel on Education on 9 December 2013. While some Members expressed that support for improving IT infrastructure to all public sector and DSS schools should be implemented in three years' time as reflected in the two motions passed at the Panel on Education, Members generally have no in-principle objection to our proposed measures.

32. We have consulted stakeholders of the WebSAMS including schools and WebSAMS user representatives, who are supportive of the present proposal on the upgrading of the WebSAMS. We also consulted the Panel on Education on 9 December 2013. Members generally supported our proposed measures.

**BACKGROUND**

33. In recognition that e-textbooks, as supported by e-learning functions written for the local curricula, can be a desirable e-learning resources to facilitate effective learning and teaching inside and outside classroom, the Government launched two phases of EMADS in 2012 and 2013 respectively with a non-recurrent commitment of \$50 million approved by FC vide FCR(2012-13)35 for providing seeding grants on a matching contribution basis to successful non-profit-making applicants. The first batch of e-textbooks which are being developed under Phase I of EMADS will be available for use in schools in the 2014/15 school year.

34. On 24 September 1993, FC approved vide FCR(93-94)78 the implementation of an Information Systems Strategy in the then Education Department (ED). Being one of the nine projects under the Strategy, the School Administration and Management System (SAMS) was first launched in 1994, to provide all public sector and DSS schools with a networked computer system to assist in their administration and management processes and enable the electronic transmission of information between schools and ED.

35. To further meet users' needs, ED proposed and FC approved vide FCR(2000-01)37 on 23 June 2000 a non-recurrent commitment of \$376 million to replace SAMS computers and convert the system into a web-based application amongst other things. The enhanced system was thereafter referred to as WebSAMS.

36. To improve the system processing power and the storage capacity of the WebSAMS, which was based on the standard in 2001 and to reduce security risk, a non-recurrent commitment of \$67 million was supported by FC on 1 February 2008 vide FCR(2007-08)54 for upgrading the WebSAMS hardware, system software and application programs.

37. The major system functions of the WebSAMS include management of school, maintenance of staff and student information (including parent contact information, student attendance record, award and punishment records, and student activities, etc.), timetabling, report card preparation and printing, school places allocation, and electronic data exchange between schools and EDB and other third parties such as the Hong Kong Examinations and Assessment Authority and the SFAA, etc. A list of the WebSAMS applications is at Enclosure 2.

Encl. 2

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Education Bureau  
January 2014

## Cost Benefit Analysis

	Total amount per annum (HKD '000)							
	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	Total
<b>Cost</b>								
Non-recurrent								
-Expenditure	62,600	4,400	-	-	-	-	-	67,000
-Staff cost	3,255	1,604	-	-	-	-	-	4,859
Sub-total	65,855	6,004	-	-	-	-	-	71,859
Recurrent								
-Expenditure	-	8,370	8,370	12,370	12,370	12,370	12,370	66,220
-Staff cost	-	13,768	13,768	13,768	13,768	13,768	13,768	82,608
Sub-total	-	22,138	22,138	26,138	26,138	26,138	26,138	148,828
<b>Total Cost</b>	<b>65,855</b>	<b>28,142</b>	<b>22,138</b>	<b>26,138</b>	<b>26,138</b>	<b>26,138</b>	<b>26,138</b>	<b>220,687</b>
<b>Savings</b>								
Recurrent								
-Notional savings <sup>(*)</sup>	-	1,870	1,870	1,870	1,870	1,870	1,870	11,220
-Cost avoidance <sup>(**)</sup>	-	25,779	25,779	25,779	25,779	25,779	25,779	154,674
<b>Total savings</b>		<b>27,649</b>	<b>27,649</b>	<b>27,649</b>	<b>27,649</b>	<b>27,649</b>	<b>27,649</b>	<b>165,894</b>
<b>Net savings</b>	<b>(65,855)</b>	<b>(493)</b>	<b>5,511</b>	<b>1,511</b>	<b>1,511</b>	<b>1,511</b>	<b>1,511</b>	<b>(54,793)</b>
<b>Net cumulative savings</b>	<b>(65,855)</b>	<b>(66,348)</b>	<b>(60,837)</b>	<b>(59,326)</b>	<b>(57,815)</b>	<b>(56,304)</b>	<b>(54,793)</b>	

(\*) Based on the assumption that there is 1 second saved on average for each report generated and 15 minutes saved on average for each report modification in the new system environment and 3% increase in system performance.

(\*\*) Cost avoidance from the cost of maintaining the existing WebSAMS, including hiring of contract staff efforts, hardware maintenance and vendor support.

**Functions and Applications of Web-based School Administration and Management System (WebSAMS)**

There are currently 27 applications in the WebSAMS –

- School Management;
- Student;
- Attendance;
- Student Activities;
- Award and Punishment;
- Assessment;
- Student Learning Profile;
- Special Assessment;
- Staff Deployment (arranging substitute teachers within schools);
- Staff;
- Communication and Delivery System;
- Hong Kong Attainment Tests (conducting student performance analysis);
- Applied Learning;
- Hong Kong Examinations and Assessment Authority (HKEAA);
- Financial Monitoring and Planning;
- School Places Allocation (for Primary 1, Secondary 1 and 4);
- Student Activity Subsidies;
- Student Financial Assistance Agency;
- Report Management (editing report templates for school-based needs);
- Data Management (extracting data from the WebSAMS for their own computer applications);
- Data Query Tool;
- Timetabling;
- Code Management (including standard codes and school-defined codes for school-based subjects and activities);
- Security (controlling access rights);
- E-mail;
- Archive (performing records and files backup); and
- Customisation (personalising the WebSAMS screen layout according to individual specifications)

To facilitate electronic communication between EDB and schools, a Communication and Delivery System is installed in the WebSAMS to serve as an interface between the WebSAMS and other computer systems of EDB and the HKEAA. In addition, a Data Query Tool is provided for schools to compile survey data in specified format as required.

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