For discussion
on 9 December 2013

Legislative Council Panel on Education

**Supporting Schools to Adopt E-textbook
to Facilitate Learning and Teaching and
Upgrading of the Web-based
School Administration and Management System**

PURPOSE

      This paper seeks Members' views on the Administration's proposal to (a) support schools to adopt e-textbooks to facilitate learning and teaching; and (b) upgrade the computer server and related system software of the Web-based School Administration and Management System (WebSAMS) in schools.

SUPPORTING SCHOOLS TO ADOPT E-TEXTBOOK

Background

2.   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 E-textbook Market Development Scheme (EMADS) in 2012 and 2013 respectively[1]. The first batch of e-textbooks which are being developed under the Phase I of EMADS will be available for use in schools in the 2014/15 school year.

How e-Textbook Should be Used in Class

3.   The e-textbooks under the EMADS contain multi-media presentations and interactive functions which facilitate students' understanding, self-directed learning and collaboration, with the facilitation of teachers using new pedagogical skills. Taking into account existing pedagogical practices using technology and developing practices captured

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[1] To encourage potential and aspiring e-textbook developers to develop e-textbooks in line with the local curricula and to try out a quality vetting and assurance mechanism for e-textbooks with a view to drawing up a Recommended Textbook List for e-textbooks, the Administration launched the EMADS with a non-recurrent commitment of $50 million for providing seeding grants on a matching grant basis to successful non-profit making e-textbook developers.

from literature and the experiences from participating schools in the Pilot Scheme on e-Learning in Schools[2] and the partner schools which try out the e-textbooks developed under the EMADS, as well as contemporary classroom practices, the way on how e-textbook should be used in class and the associated technological requirements are set out as follows.

4.   First of all, technology is to enhance learning where appropriate. Classroom remains a platform for human-human interaction and this should reign over human-technology interaction.

5.   For effective use of e-textbooks, mobile computing devices (laptop or tablet computers) will be used which house the main content of the e-textbook including media-rich materials such as video.   These devices should be connected to the school network and the Internet via WiFi connectivity for Internet search, downloading worksheets, collaborative learning, etc.   As such, schools intending to use e-textbooks should have access to a stable, secure WiFi connection with reasonably high bandwidth. At the back end, schools should have a pedagogically sound learning management system (LMS) for managing learning resources and learning activities, delivery of learning content, engaging students in assessment tasks, etc.

6.   To capitalize on using e-textbooks in class, we are advocating that groups of students of 2 to 3 will share a device.   Such an arrangement is considered sufficient to carry out the technology dependent activities and at the same time to maintain sufficient human-human interaction in class.

7.   We have reviewed the readiness of schools to adopt e-textbooks in class.   From the perspective of IT infrastructure support, it is noted that the readiness of schools varies.   According to our recent study and surveys[3], all schools have equipped their classroom with a desktop computer connected to the Internet and a projector, a basic LMS and some of them have enough mobile computing devices for shared use in some classes.   However, there are less than 10% out of some 1 000 public sector schools that are sufficiently equipped with WiFi connectivity in classroom to effectively use e-textbooks.

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[2] The Pilot Scheme on e-Learning in Schools is a three-year project spreading across the 2011/12 to 2013/14 school years.   The selected 21 school projects involved 61 primary, secondary and special schools.   They will serve as research and development centres to develop school-based e-learning resources, validate when and how e-learning works best, bring about effective interactive learning, cater for learner diversity and help find ways to promote e-learning in local schools.

[3] The recent studies included (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 EDB to collect schools' views on e-Learning and other relevant data related to IT in education.

8.   The aforesaid studies above also revealed that most schools (over 70%) have integrated IT skills into the school curriculum across different disciplines and extra-curricular activities.   Teachers have progressively got accustomed to using emerging technologies to strengthen their pedagogical practices and thus enhance the effectiveness of learning and teaching.   The number of applications for the Pilot Scheme on e-Learning in Schools (with 100 applications) in 2010 and the Partner Schools Scheme to try-out e-textbooks developed under EMADS (with more than 150 applications in Phase I) in 2012 showed that schools and teachers are enthusiastic about implementing e-Learning through the use of e-textbooks. Though pedagogical practices for e-learning are emerging, feedback from teachers in the Partner Schools Scheme under EMADS as well as e-textbook developers pointed to the need for intensive professional development for teachers and school leaders for whole school implementation of e-learning through the use of e-textbooks.

Proposed Measures for Supporting Use of e-Textbooks

9.   To support schools which are interested in using e-textbooks in the 2014/15 school year and to build up the capacity of the school sector to further adopt e-learning, a series of measures are proposed to empower schools in terms of IT infrastructure, capacity building for teachers in preparation for whole-school adoption of e-textbooks, and enhancing user experience through better integration between schools' learning management system and various e-textbooks/e-learning resources platforms.

IT Infrastructure and Teacher Capacity Building

10.   To empower schools in terms of IT infrastructure and to build teachers' capacity, it is proposed that a trial scheme will be launched under which about 100 public sector schools will be provided with funding to *enhance or top up* their IT infrastructure to cater for the need of using e-textbooks in class as outlined in paragraphs 4 to 6.   With support from the Education Bureau (EDB), both pedagogical and technical, these schools will act as change agent to achieve the following missions –

   (a) to work with service providers to build up the necessary infrastructure conductive to the use of e-textbooks in class;
   (b) to act as test bed for the infrastructure buildup process and other value-added services;

(c) to establish pedagogical use of e-textbooks and to build an intra-school community of practice to facilitate whole-school adoption of e-textbooks and hence e-learning; and

(d) to share with other schools the lessons learnt, including setting up of relevant community of practice among teachers.

11.   To achieve (a) and (b) above, we propose setting aside $35 million as one-off grant to these schools for setting up the necessary WiFi environment in their school premises.   These schools can also use the grant to acquire sufficient mobile computing devices (an average of 50 devices which should be sufficient for use on a 2 or 3 students to 1 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.   In line with the current practice for disbursement of the Composite IT Grant, the rate of grant will be commensurate with the number of classes, and each school will receive a one-off grant in the range of $242,500 to $606,400 for use until the end of the 2016/17 school year.   Unused grant at the end of the 2016/17 school year will be clawed back.

12.   To help teachers establish pedagogically sound use of e-textbooks (missions under (c) and (d) of paragraph 10), we will provide intensive and tailor-made professional development programmes for teachers of these schools to beef 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 envisioned 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.   The estimated funding requirement for developing and delivering the professional development programmes is $2 million.

13.   To ensure the necessary WiFi environment be built up on time for using e-textbooks developed under EMADS, technical and project management support will be centrally arranged by EDB and provided to these schools.   The services will include technical advice on the design of the WiFi infrastructure and monitoring of work by service providers.   The estimated funding requirement for procuring the support services is $3 million.

Online Integration Services Platform

14.   The learning environment conducive to e-learning goes beyond

just the network infrastructure and devices; it requires an online platform, generally known as LMS that can support the management of learners' data, learning resources and online learning activities. At present, most public sector schools have some form of LMS operating within their school network. With e-textbooks and other e-learning services operating on a subscription basis, students often have to log in to various e-textbook/e-learning resources/services systems 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. In other words, the e-learning resources/services platforms are detached from the schools' LMS. As for e-learning resources providers, they will face additional overheads in delivering the contents to schools as different schools may require different interface or solutions. They will also have to create and manage large number of student accounts. All these hindrances will be aggravated when schools increasingly adopt e-textbooks and e-learning resources.

15.   Our proposed solution is to build an online integration services platform which facilitates the concurrent and seamless application of various e-textbooks/e-learning resources/services systems in schools, as well as the operation of the school based LMS system in a more integrated manner. This integration platform can –

(a) provide account management for both users and content providers;
(b) serve as a common file exchange platform for delivery of digital learning materials including e-textbooks from content providers to students' network storage; and
(c) facilitate exchange of learning data (e.g. assessment data) between content providers and schools.

16.   The online integration services platform can best be developed and operated by the Hong Kong Education City Limited[4] (HKECL) which has the edge of having a robust platform providing services to the education community for over a decade and holds the single largest membership of students and teachers. The estimated funding requirement for developing the platform is $10 million.

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[4] 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.

Implementation Plan

17.   The total financial implications for the proposed supporting measures for schools to adopt e-textbooks as outlined above is $50 million, broken down as follows –

	Item	*Amount ($ million)*
1.	One-off grant to schools for subscription of WiFi services and acquiring mobile computing devices	35
2.	Development of online integration services platform by HKECL	10
3.	Provision of professional development programmes for teachers	2
4.	Provision of technical and programme management support services for schools	3
	Total	**50**

Both the $35 million grant to schools and $10 million grant to HKECL will be disbursed in 2013-14 for early preparation of the work concerned while the remaining expenditure totaling $5 million will be incurred in the next two financial years in 2014-15 and 2015-16.

18.   Subject to the support of Members and the Finance Committee in mid-January 2014, public sector schools will be invited to apply for participating in the scheme. Applicants will be selected based on their three-year e-learning development plan including, but not limited to, the following areas –

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

Other factors including 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 by mid-March 2014 and the infrastructure buildup, support services and intensive teacher professional development programmes will begin in April 2014.

19.   HKECL will kick-start the development of the online integration services platform in January 2014 and will deliver the services in two phases as follows –

(a)   Phase 1 – by Q3 2014 with the following:
   –   Single-sign-on service;
   –   E-textbook content from developers on a common learning platform for students; and
   –   Content updating mechanism.

(b)   Phase 2 – by Q2 2015 with the following:
   –   Supporting more industry standards in digital publishing;
   –   Exchange of learning data; and
   –   Capacity to support large scale implementation.

UPGRADING OF THE WEB-BASED SCHOOL ADMINISTRATION AND MANAGEMENT SYSTEM

Background

20.   The WebSAMS is a web-based application system developed by the EDB to provide all public sector schools, including government, aided and caput schools, as well as local schools under the Direct Subsidy Scheme, with a networked computer system to assist in their administration and management processes and enable the electronic transmission of information between schools and EDB.

21.   The major system functions of 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 Student Financial Assistance Agency (SFAA), etc.

Updating Need for WebSAMS

Reducing Security Risk and Ensuring Program Compatibility

22.   The WebSAMS 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 ensure that WebSAMS, which contains amongst others 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.

Improving Efficiency and Ensuring Sustainability

23.   Furthermore, since the rollout of the WebSAMS, there has been a continuous increase in the usage of the system among schools.   To cater to the needs of the schools, there have also been various enhancements to the functions of the system, like the automation of submission of applications for student textbook and travel allowance to the SFAA, the electronic submission of school calendar to EDB, the generation of analysis reports on student performance cross 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 Measures

24.   We therefore propose to replace and upgrade the WebSAMS servers, related system software and to enhance the WebSAMS application programs ensuring 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.

25.   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.   The upgrading cost per school is estimated at about $57,000, including the cost of procuring server hardware, system software and installation service. Specifically, 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 for use[5].   Schools may spend the one-off grant across years, but in any case no later than the end of 2015.   Unspent provisions would be clawed back.   EDB will provide schools with the required technical specifications for reference and will offer assistance/support to schools throughout the upgrading exercise.

26.   The enhancement of the WebSAMS application programs will be centrally arranged by the EDB.   The new version of the WebSAMS application programs will be distributed to schools in mid-2014 for deployment under the new platform.

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[5] The one-off grant will be about $50,000 as EDB would centrally procure some system software for schools.

27.   The proposed upgrading of WebSAMS will give rise to non-recurrent expenditure of about $67 million over two years from 2014-15 to 2015-16, of which $57 million will go to acquisition of hardware and software by schools.   The remaining about $10 million will be used by EDB to enhance the WebSAMS application programs and procure support services for schools during the implementation process.

ADVICE SOUGHT

28.   Members are invited to give their views on the proposed measures to support schools in adopting e-textbook in the 2014/15 school year and to upgrade the WebSAMS as set out in this paper.   Subject to Members' comments, we plan to seek funding approval of the Finance Committee in January 2014 for creation of a commitment at $50 million to implement the proposed measures to support schools in adopting e-textbook and a commitment at $67 million to implement the proposed measures to upgrade the WebSAMS.

Education Bureau
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