The e-Learning Jamaica Project

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Abstract

Currently in Jamaica, while voice telephony has achieved practical universal access, there is relatively low demand for access to data and data-related services due to the relatively low level of education. This is a major hurdle to the creation of a knowledge-based society, critical to global competitiveness.

The Ministry of Industry, Technology, Energy and Commerce (MITEC) is collaborating with the Ministry of Education and Youth (MOEY) to implementing the e-Learning Project in grades 7-11 in all approx. 165 high schools in Jamaica and utilizing information and communication technologies (ICT)s to enhance the teaching/learning process and improve the level of passes in the school-leaving examinations by providing:

a. A standard set of ICT-based instructional materials for teachers and students in 11 subject areas and available on various media, including exciting text, CD's, DVD's, Internet, Cable TV

b. Equipment, software and broadband access to schools and establishing a Central Repository (CREM) to house and manage the materials

c. Training and Professional Development of teachers in the use of the new technologies in instructional delivery

d. Extensive support of remedial programmes being undertaken by the MOEY and other institutions

e. Institution of a standard examination in grades 7-9 across all high schools that will measure the performance of students in each grade.

A pilot project is being implemented in 28 schools in 5 subjects during 2006-2007 and the project will be rolled out during 2007-2009.

1.0 BACKGROUND

In May 2005, the Government of Jamaica was satisfied that the country had made significant strides in the de-monopolization of the telecommunications sector and had achieved practical universal access with respect to voice telephony as the country had a penetration of approximately eighty two percent (82%). Hence, the Ministry charged with the responsibility, the Ministry of Technology, Industry and Commerce (MITEC), did not intend to pursue any new initiative with respect to increasing the access to voice telephony as the telecommunication companies were actively building out their networks and areas which were inadequately served would have improved service in due course.

Against this background, MITEC strategically shifted its focus from voice telephony to universal access to data and data-related services through the Internet. Access to data and the extensive use of data-related services are features of an educated, competitive and

knowledge-based society. However, Jamaica, an oral society largely because of the low level of education, has low demand for Internet access and data-related services compared to the developed countries and even compared to some Caribbean countries.

Hence, while use of voice telephony had increased significantly, access to data and written forms of communication, such as use of e-mail, have lagged behind. The low level of education is a major hurdle to the creation of a knowledge-based society.

The Ministry was also concerned that within the context of the CARICOM Single Market and Economy (CSME), the Free Trade Areas of the Americas (FTAA) and economic globalization of markets, Jamaica's survival will be dependent on its ability to accelerate the creation of a highly educated and knowledge-based society, a pre-requisite for international competitiveness and survival in the new global environment.

MITEC was therefore convinced that in order to increase demand for access to data and data-related services and also in order to create a knowledge-based society and reduce the digital divide, the educational level of the country must first be enhanced. By improving the quality of education and increasing the use of the Internet by students in schools, demand for the Internet and data-related services will be created, as the students will recognize its importance and encourage their parents to acquire computers and gain access to the Internet.

2.0 PROJECT DEVELOPMENT PROCESS

In light of the foregoing, MITEC collaborated with the Ministry of Education and Youth (MOEY) to provide targeted support to the education sector in order to improve the quality of education. In addition, recognizing the potential of information and communications technology (ICT) to improving the education sector, MITEC initiated discussions and in December 2003, signed a memorandum of understanding (MOU) with the International Telecommunications Union (ITU), which proposed an intervention involving the use of ICTs to support the education sector and also to increase access to the out-of-school population.

Following the signing of the MOU, MITEC, in collaboration with the MOEY, conducted research into the challenges being faced by the education sector and developed a Draft Feasibility Study entitled "e-Learning Project" a comprehensive and integrated project anchored in ICTs, to address certain **specific weaknesses** within the education sector and focusing exclusively on improving the quality of education in Jamaica's high schools.

From resources provided by the ITU, a consulting firm was contracted in mid 2004 to undertake wide stakeholder consultations in the field to validate the Draft Feasibility Study and recommend adjustments and modifications based on the feedback obtained.

In undertaking their field work over a period of approximately six months, the Consultants met with officers of the MOEY and related agencies and institutions and held intensive focus group meetings seeking the views of principals, senior teachers and students from the proposed pilot schools.

The Draft Feasibility Study was revised and finalized, based on the findings and recommendations of the Consultants, and the project was approved by Cabinet in March 2005.

3.0 PROJECT GOAL

The primary goal of the Project is to contribute to an improvement in the quality of education between Grades 7-11 (Forms 1-5) in the one hundred and seventy-two (172) secondary, technical, agricultural and special high schools island-wide, such that the passes in the Grade 11 school-leaving examinations are improved.

4.0 SPECIFIC CONSTRAINTS IN JAMAICA'S EDUCATION SYSTEM

The Project is intended to address five (5) specific constraints which adversely impact the quality of education in the high schools. (Other constraints impacting negatively on the quality of education in the high schools will be addressed through other initiatives of the MOEY.) The five (5) constraints are as follows:

(i) lack of a comprehensive set of standard instructional materials for both teachers (especially young and inexperienced teachers) and students;

(ii) inadequate equipment in schools to enhance teaching and learning using modern technologies and lack of a proper Educational Management Information System (EMIS) in the MOEY to facilitate effective administration of the education sector;

(iii) low level of skills among some teachers in the use of certain technologies such as interactive software for teaching "hard to grasp" topics and stimulating interest among students, especially boys;

(iv) inadequate remedial programme at Grade 7 to enable weak students who have been promoted from Grade 6 to high school to cope with high school work. This is especially so among the newly upgraded high schools; and

(v) lack of a standard system of measuring and tracking the performance of students at each grade so that timely remedial action can be taken and also lack of a common yardstick for measuring the performance of teachers and schools so that effort can be rewarded.

5.0 PROJECT OBJECTIVES

The objectives of the project are intended to have a positive impact on the above constraints, as follows:

(i) to provide a comprehensive set of standard ICT-based instructional materials for teachers and students, as well as the subject tutors in the institutions that train teachers, in eleven (11) subject areas;

(ii) to ensure access to the materials by

a. providing equipment and software to schools to enhance teaching and learning using modern technologies;
b. establishing a Central Repository for Instructional Materials (CREM) at the MOEY to manage the storage and dissemination of the materials;
c. instituting an Educational Management Information System (EMIS) in the MOEY to facilitate effective administration of the education sector
d. arranging for the transmission of lecture videos through cable television

(iii) to train teachers in the use of certain technologies such as interactive software in the teaching of "hard to grasp" topics and to stimulate interest among students, especially boys;

(iv) to collaborate with existing remedial programmes in the high schools to provide appropriate ICT-based materials and technology and training of instructors

(v) to institute a standard examination that will measure performance of students in each grade between grades 7-9.

6.0 PROJECT COMPONENTS

The project has five (5) components which are intended to address the five (5) specific constraints and which are aligned to the five (5) objectives indicated above. Below is a concise description of the five (5) project components.

6.1 Development of Instructional Materials

This component involves the acquisition and/or development of a detailed and comprehensive set of instructional materials in digital format for teachers and students in eleven (11) designated subjects spanning grades 7-11. The subjects decided on in consultation with the MOEY and the schools are:

(i) English Language
(ii) Mathematics
(iii) Social Studies
(iv) Integrated Science
(v) Resource & Technology/Information Technology
(vi) Spanish
(vii) Geography
(viii) Building Technology
(ix) Chemistry
(x) Biology
(xi) Physics

(It is envisaged that depending on resource availability, other subjects will be dealt with at a later date)

This is a major undertaking and is the most important and involved component of the project. The materials will include the development of the following for the eleven (11) subjects at the five (5) grades:

> (i) Teachers' Instructional Manuals (TIM's) will be developed on a modular/unit basis and include comprehensive content, suggested international best practice teaching methodologies for each topic, and recommended best practice assignments and projects. The TIM for a particular grade would have a suggested set of student activities/assignments/projects on a topic basis drawing on extensive national and international best practices. For each subject at a particular grade, there would be a recommended timetable with due dates regarding each activity/assignment/project. Hence, at the start of the year, each student would be aware of the assignments/projects to be carried out and due dates in a similar way to the school-based assessment (SBA) for CSEC (CXC). It is envisaged that through carefully selected activities/assignments/projects, Jamaican students will be assured the highest

quality "hands-on" learning experiences similar to those afforded students in developed countries. It is also intended to shift the learning focus away from the abstract and more toward the practical and student-centered learning. The TIMs will be in digital format to facilitate easy modification by teachers to suit their personal tastes and preferences.

(ii) Students' Instructional Manuals (SIM's) mirroring the TIM's will act as the core text for the student for the particular subject and will cover the topics in the syllabus comprehensively. The schools will continue to rent text books to students to complement the SIM's and to provide variety.

(iii) The project will Identify interactive computer software with emphasis initially on free computer software (freeware) that is available on the Internet, to support the teaching of selected "hard to grasp" topics or for reinforcement and greater internalization by students. In the case of the sciences (chemistry, physics and biology), interactive software will be developed/acquired to support these subjects and to complement lab work.

(iv) A comprehensive videotaped lecture series on a topic by topic basis delivered by master teachers for all eleven (11) subjects for the five (5) grades will be developed. These lectures will be available on DVD for students to borrow through the school library or purchase for viewing at home at their convenience to reinforce and/or clarify the teaching in the classroom. There will also be high quality video recordings of a comprehensive set of lab procedures/experiments to buttress laboratory teaching in chemistry, physics and biology. The lecture series will be also be available on cable Channels

(v) An extensive database (Item Bank) of multiple choice questions (MCQ's) and answers as well as extended questions, on a topic-by-topic basis for each subject at each grade will be built up over time. All questions and answers will be stored in an electronic database where they will be accessible to teachers and students via the school's intranet. A teacher will therefore be able to access questions and answers randomly from the database on a particular topic and set and mark a test with little effort. Following the teaching of a topic, a student will also be able to do a self test on his/her own on-line and get the results of the test in real time. This will facilitate easy continuous assessment throughout the year.

Teachers' Colleges will also benefit from this material. The MOEY will own the copyright to all materials developed so that schools, students and the public can reproduce them at will. The MOEY will also have responsibility for the on-going updating of the materials.

The materials acquired/developed will be required to meet international standards and will display the use of best practices and expertise in instructional design, and writing, and will undergo rigorous testing and review to ensure quality

Materials will include exiting text, power point presentations, interactive software, databases, web-based material, and will be available via CDs, DVD.s, on-line, cable TV, radio, and video and tele-conferencing

6.2 Technology Infrastructure

(i) The project will provide computers, workstations and local area networks to each school for teaching of all eleven (11) subjects. Schools will be equipped with multi-media projectors and other curriculum delivery

equipment to facilitate interactive presentations by teachers and be connected to the Internet.

(ii) The eight (8) educational Institutions that train high school teachers will also be equipped with computers and multimedia equipment.

(iii) Support will be provided for the establishment of the CREM and implementation of the (EMIS) at the MOEY

(iv) Support will also be provided for the interactive education television station known as "EdU-TV" being established by the MOEY. This facility will provide access to and will be the testing station for a range of educational content.

(v) Arrangements will be made for some twelve (12) cable television channels to be dedicated to the transmission of the lecture series mentioned earlier. Each channel will be dedicated to the transmission of the lecture series for one (1) or two (2) subjects. The channel, which would transmit content continuously, would serve to enhance the promotion and development of that particular subject. Centre-of-excellence teachers in the subject will be featured, sharing local and international best practices in the teaching of the subject. Companies will be invited to sponsor the operating cost of the channels for possibly a two-year period. A company will advertise its products on the channel and associate itself with the development and promotion of the particular subject.

6.3 Teacher Training

The project will provide the over 6,000 teachers in the targeted high schools and subject lecturers from the targeted teacher training institutions with an orientation to the new instructional materials (TIM's and SIM's). Teachers and lecturers will also be trained and certified in Information and Communication technologies and will be trained in the use of these modern technologies in instructional delivery.

It is expected that the Teachers Colleges will utilize the wide area network implemented by the Joint Board of Teachers Colleges through the USAID-funded CETT programme, to deliver thwe courses to the lecturers

6.4 Remedial Programme

The project will identify and support existing remedial programmes and collaborate in enhancing these programmes to buttress the effort of teachers, particularly with the use of ICT's such as interactive software and specialized equipment.

The programme will explore the possibility of utilizing high performing students and qualified persons outside the classroom to assist with reading and other areas of weakness and will have an element for the training of parents in parental skills and the kind of support and guidance parents need to provide to their children at home to facilitate performance in school. Parents of students in the same grade would be encouraged to form networks/support groups and meet at intervals to discuss problems, share experiences and devise solutions.

6.5 Voluntary End-of-Year Pre-CXC Exam

The project will institute on a voluntary and phased basis a standard end-of-year Pre-CXC

Examination in the eleven (11) subjects, to measure performance of students. This exam will be administered at grades 7-9. Students will sit the usual CXC/CSEC Examinations at Grade 10 & 11. CXC will prepare the Pre-CXC Exam papers but the scripts will be marked by the schools. Teachers will be trained by CXC to mark the papers, so facilitating the comparison of all high schools using a common yardstick.

The Exam will facilitate the early identification of academic weaknesses within and among schools so that timely affirmative action can be taken before the children are ready to sit the CXC Exams in grade 11. Affirmative action could mean the implementation of extensive remedial work among schools with weak students, and the provision of proportionally more resources to those schools to assist them in improving their performance.

7.0 PROJECT FUNDING

The project is estimated to cost approximately US$50 million over three (3) to four (4) years. Funding will come mainly from a universal service obligation levy implemented since September 2005, on incoming calls. This follows a policy decision of MITEC to use resources from telecommunications sector to improve the quality of education over the next three (3) to four (4) years and to increase the demand for access to the Internet and data-related services.

The International Telecommunication Union (ITU) has provided computer equipment to the e-learning administrative office, valued at US$30,003. It is envisaged that other development partners to be identified will provide some support for the implementation of the Project.

8.0 PROJECT IMPLEMENTATION

The project is being implemented in three phases over three (3) years, September 2006 to August 2007, September 2007 to August 2008, and September 2008 to August 2009

Phase 1 will be a **Pilot Project** involving twenty-eight (28) public high schools including 1 special school, one (1) independent high school and three (3) teachers colleges. The other targeted institutions will be addressed in the subsequent years. All methodologies, strategies, support systems will be tested and experiences and lessons learned will inform and help guide the second phase.

Five (5) subjects will be included in the pilot at the Grades 10 & 11:

English Language
Mathematics
Chemistry
Biology
Information Technology

A baseline study will be undertaken during September to get formative information on the students for the project and to determine the technology capacity of the pilot institutions. It is intended that equipment and some instructional materials will be installed in the pilot schools for use beginning in September 2006. Methodology Training has commenced and all grade 10 & 11 teachers will be trained by September 2006. ICT Training and Certification will commence during in October 2006 and some 2000 teachers will be certified by the end of phase 1

In order to facilitate access from home and full buy in from the teachers, a revolving loan will be provided for the purchase of computers interest-free.

Acquisition and development of instructional materials, including educational software, will initially focus on weak areas as identified by the reports on the CXC results over the years, so that the current examination students can gain the maximum benefit from the programme. Item writing has already commenced and it is expected that some 1,000 questions will be available in the Item Bank by January 2007

The CREM will be established by January 2007 which will allow materials to be available online in addition to CD's and DVD's. Lectures on video will be available as of November 2006. Work will also begin on the Remedial and Assessment Programmes during the pilot phase.

An evaluation of the pilot will be carried out in July and August 2007, to inform the planning for Phase 2 which will begin in September 2007.

9.0 LESSONS LEARNED TO DATE

- The importance of collaboration, involvement of stakeholders
- The need for continuous research and refinement and flexibility– nothing cast in stone
- The need to use existing materials, methodologies, know-how – need not invent the wheel

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