

FEASIBILITY STUDY

For

e-LEARNING PROJECT

A Project of the

**Ministry of Commerce, Science and Technology
(MCST)**

in collaboration with the

**Ministry of Education, Youth and Culture,
(MOEYC)**

and

Development Partners

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ABBREVIATIONS

CAPE	-	Caribbean Advanced Proficiency Examination
CAS	-	Continuous Assessment System
CASE	-	College of Agriculture, Science and Education
CAT	-	Continuous Assessment Tracking Chart
CCJ	-	Caribbean Court of Justice
CIT	-	Caribbean Institute of Technology
CITO	-	Central Information Technology Office
CPTC	-	Creative Production and Training Centre
CREM	-	Central Repository for Educational Material
CSME	-	Caribbean Single Market and Economy
CXC	-	Caribbean Examination Council
EMIS	-	Educational Management Information System
EU	-	European Union
EW	-	Extended Writing
FCL	-	FocalPoint Consulting Ltd.
FTAA	-	Free Trade Areas of the Americas
GCE	-	General Certificate of Education
GDP	-	Gross Domestic Product
GG-EVC	-	Governor General – Educational Volunteer Corps
GNAT	-	Grade Nine Achievement Test
GSAT	-	Grade Six Achievement Test
HEART/NTA	-	Human Employment and Resource Training Institute/National Training Agency
HISEP	-	High School Equivalency Programme
ICT	-	Information & Communications Technology
ISP's	-	Internet Service Providers
ITDE	-	Instructional Technology and Distance Education
ITU	-	International Telecommunication Union
JAMAL	-	Jamaica Movement for Adult Literacy

JHSCE	-	Junior High School Certificate of Education
JTBE	-	Joint Board of Teachers Education
MCQ	-	Multiple Choice Questions
MCST	-	Ministry of Commerce, Science and Technology
MOEYC	-	Ministry of Education, Youth and Culture
MOU	-	Memorandum of Understanding
NAP	-	National Assessment Programme
NCTVET	-	National Council for Technical & Vocational Education
NCU	-	Northern Caribbean University
NGOs	-	Non-governmental Organizations
NVQJ	-	National Vocational Qualification of Jamaica
PIP	-	Project Implementation Plan
PMQC	-	Project Manager and Quality Control
PTA	-	Parent Teacher Association
ROSE	-	Reform of Secondary Education
SBA	-	School-Based Assessment
SIMs	-	Students' Instructional Manuals
STF	-	School Technology Fund
STVO's	-	Subscriber Television Operators
TIF	-	Technology Investment Fund
TIMs	-	Teachers' Instructional Manuals
TLC	-	Technology Learning Centres
TOR	-	Terms of Reference
USF	-	Universal Service Fund
USO	-	Universal Service Obligations
UTECH	-	University of Technology
UVL	-	UTECH Virtual Learning
UWIDITE	-	University of the West Indies Distance Teaching Enterprise

1. INTRODUCTION AND CHRONOLOGY OF PROJECT DEVELOPMENT

This project was planned and developed by the Ministry of Commerce, Science and Technology (MCST) in collaboration with the Ministry of Education, Youth and Culture (MOEYC). The project is based on a Memorandum of Understanding (MOU) signed between the MCST and the International Telecommunication Union (ITU) in December 2003. The MOU was the culmination of several discussions between the Hon. Minister of Commerce, Science and Technology, Phillip Paulwell, and the ITU leadership regarding an information technology project that would draw on developments in telecommunications to support education in Jamaica and the development generally of an educated and knowledge-based society. The development of an educated society is seen as critical by the Government of Jamaica to successfully compete in the new global economic environment.

The ITU leadership shared the vision of the Government of Jamaica and decided to provide technical assistance in the preparation of the project document. It was envisaged that the ITU would fund an aspect of the project and would seek to interest other international development partners in funding other components. It was also envisaged that the project would be funded from contribution from the local telecommunications sector and corporate Jamaica.

Following the signing of the MOU, the MCST in collaboration with the MOEYC proceeded immediately to prepare a draft feasibility study for a project entitled “e-Learning Project.” The project represents the views of both ministries in terms of the strategy to address certain specific constraints and needs within the education sector. The Minister of Education, Youth and Culture guided the process from a policy perspective and instructed that the project should focus on the **high school** segment of the education system comprising Grades 7-11. She instructed that the objective of the project should be to improve the **quality** of education in the high schools since other interventions had made significant impact on **access** to high schools. She also advised that other interventions were underway to address other needs such as those existing at the primary level.

On completion of the draft feasibility study, it was shared with the ITU and several other local stakeholders for comments. With funding from the ITU, through a competitive selection process, the MCST contracted FocalPoint Consulting Ltd. (FCL) in July 2004 to review and appraise the draft feasibility study and to advise on the suitability of the project as planned. This required the Consultants to undertake field work comprising extensive consultation with a range of stakeholders including:

- Minister (MOEYC)
- Minister (MCST)
- Minister of State (MOEYC)
- Permanent Secretary and Chief Education Officer of MOEYC
- Senior directors and other officials of MOEYC
- Senior officials of MOEYC portfolio agencies
- Senior directors and officials of MCST and portfolio agencies
- Jamaica Teachers Association
- Representative of the ITU
- Representatives of the Caribbean Examination Council (CXC)

- Principals, senior teachers and students from sixteen pilot schools
- Officials of the Joint Board of Teacher Education, University of the West Indies and other stakeholders in the education sector

In their field work and consultation exercise, the Consultants sought to get feedback from the various stakeholder groups regarding the proposed project and the design of the various project components. The Consultants presented their findings and recommendations at a meeting of senior directors and technocrats of the MOEYC in October 2004. The meeting was chaired by the Permanent Secretary of the MOEYC and the project was well received. No material issue was identified and the Consultants were requested to complete their work and present their final report. The Consultants presented their draft final report entitled “Ministry of Commerce, Science & Technology (MCST)/Ministry of Education, Youth & Culture (MOEYC) e-Learning Project Final Report by FocalPoint Consulting Ltd.” on November 23, 2004. The draft final report was presented to the MCST, MOEYC and the ITU for comments.

Shortly following the submission of the draft final report by the Consultants, a National Task on Education established by the Hon. Prime Minister also presented its report. That Task Force was mandated to undertake a comprehensive review of the education system. While FCL was aware of the work of the Task Force and tried to ensure that there was no conflict between the work of the Task Force and the e-Learning Project, when the Task Force report was presented, it was noted that one of the recommendations of the Task Force was at variance with one recommendation of the FCL draft report. That recommendation has to do with the location administratively of a central repository for educational material (CREM). FCL recommended that the CREM be located in the Media Services Unit of the MOEYC while the Task Force recommended that the Media Services Unit be closed and services outsourced. In light of the Task Force report on the future of Media Services Unit, Professional Development Unit, and the Student Assessment Unit, the MOEYC had difficulty giving an official sign-off on the draft report. This delayed FCL in completing its final report.

At a Cabinet Retreat on February 22, 2005, the Hon. Minister of Education, Youth & Culture made an appeal for assistance with technology to support the education sector. In response, the Hon. Minister of Commerce, Science & Technology informed Cabinet of the proposed e-Learning Project that was in its final phase of preparation. Following the interventions of both ministers, the Hon. Prime Minister instructed that a submission should be presented to Cabinet on the e-Learning Project as a matter of urgency on March 7 when other matters dealing with the education sector would be addressed. The Minister of Education, Youth & Culture and the Minister of Commerce, Science & Technology subsequently discussed the matter and a submission on the proposed e-Learning Project was prepared. The submission drew on the draft feasibility study, FCL draft report and other information. On March 7, 2005 Cabinet considered the submission and approved the implementation of the project. Cabinet also approved an allocation of J\$50 million from the Technology Investment Fund (TIF) for the immediate commencement of project implementation. The Hon. Prime Minister also requested the Hon. Minister of Commerce, Science and Technology to urgently pursue other sources of funds such as through the local telecommunications companies within the framework of the universal service obligations, the ITU, UNESCO and other multilateral and bilateral sources.

Since the Cabinet decision, FCL was asked to prepare their final report with the understanding that the issue of the location of the CREM would be decided at a later date. FCL provided its final report on March 15, 2005 which is entitled “Ministry of Commerce, Science & Technology (MCST)/Ministry of Education, Youth & Culture (MOEYC) e-Learning Project Final Report by FocalPoint Consulting Ltd.” The report is attached as Appendix 2.

The MCST drew on the findings and recommendations in the final report of FCL, the Cabinet Submission and final comments from the ITU to prepare this final version of the “Feasibility Study on the e-Learning Project.” This is therefore the official document that will guide the implementation of the e-Learning Project.

2. EXECUTIVE SUMMARY

The policy of the Government of Jamaica is to treat education as a national priority. The Government currently allocates approximately ten percent (10%) of gross domestic product (GDP) to education. Both the Government and the Opposition have agreed that education should be given priority attention and there is the commitment to increase budgetary allocation to education by one percent (1%) of GDP per annum up to a maximum of fifteen percent (15%) over five (5) years. This has been agreed against the background of the reality that the output from the education system needs to be significantly improved.

There are several major capital projects now being implemented by the Ministry of Education, Youth and Culture (MOEYC). One of those projects which, deals with the same target group as this project is the Reform of Secondary Education (ROSE) Project funded by the World Bank. The cost of the ROSE Project is approximately US\$60 million. Another major initiative to come on stream shortly include the implementation of several recommendations contained in a high level Task Force Report on Education commissioned by the Prime Minister. The interventions contained in the Task Force Report are estimated to cost approximately US\$2.5 Billion. Funding is now being identified.

In light of the current state of the education system and its national importance, existing initiatives are not adequate. The Ministry of Commerce, Science and Technology (MCST) is convinced that a knowledge-based society anchored on broad-based education of the population, particularly in science and technology is the basis for international competitiveness within the current context of globalisation of markets. The MCST is concerned that with the coming of the Caribbean Single Market and Economy (CSME) and the Free Trade Areas of the Americas (FTAA), unless the population is properly educated and adequately skilled it will be difficult to compete on a sustainable basis in the future. Sustainable development and maintenance of social order could be jeopardized if the country is unable to compete in the new globalized environment.

Against this background, the MCST is keen on providing support to its sister Ministry of Education, Youth and Culture (MOEYC) to assist the education sector within the Government's policy of "joined-up government." The Minister of Commerce, Science and Technology and the Minister of Education, Youth and Culture are both **strongly committed** to collaborate in support of a national priority.

The MCST has made significant strides in the de-monopolization of the telecommunications sector and achievements in universal service with respect to voice telephony. The Ministry now wishes to turn its attention to universal access to data and to use information and communications technology to support education. The objective is to draw especially on the telecommunications sector to play an integral role in the creation of an educated and knowledge-based society with the vision of long term international competitiveness.

From a policy perspective, The Hon. Minister of Education, Youth and Culture (MOEYC) has decided that this project should focus exclusively on Grades 7-11 students in the high schools. She indicated that the policy of the MOEYC has been to focus on increasing the **access** to high

schools and that that policy objective has now been largely achieved. The Minister's policy directive is that this project should focus on improving the **quality** of education in **all high schools**. Other portfolio agencies such as HEART and JAMAL will focus on the "out-of-school" population.

The performance at the high school level as reflected in the passes in the Regional CXC/CSEC Examinations has been less than acceptable over the years when compared with other Caribbean countries. This relatively low level of performance has resulted in widespread local discontent and extensive public debate on the matter. There is a strong feeling that strategies need to be devised to significantly improve the quality of education at the secondary level, as the status quo will only continue to produce the same results. Hence, this project is proposing measures to assist in improving the quality of education at the CXC/CSEC level.

This project, which is entitled "e-Learning Project," will address certain needs at the secondary level involving Grades 7-11 only. The project has several components, each intended to focus on specific identified "gaps/weaknesses" which are not now being addressed by the other projects/initiatives under implementation.

The project is intended to address five **(5) specific constraints** which impact adversely on the quality of education in the high schools. Other constraints are being addressed, or will be addressed, by other interventions of the MOEYC. The six constraints are as follows:

- (i) lack of a comprehensive set of standard instructional materials for both teachers (especially young and experienced teachers) and students;
- (ii) inadequate equipment in schools to enhance teaching and learning using modern technologies; lack of a proper Educational Management Information system in the MOEYC 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 in the teaching of "hard to grasp" topics and to stimulate interest among students, especially boys;
- (iv) inadequate remedial programme at Grade 7 to enable weak students who have been promoted to high school to cope with high school work especially among the newly upgraded high schools; and
- (v) lack of a standard system of assessing performance at each grade for students, teachers and schools

The project has five (5) components which are intended to address the above specific constraints. Below is a brief description of the five components.

- (i) Develop a detailed and comprehensive set of **digital** instructional materials for teachers and students in eleven (11) designated subjects spanning grades 7-11. The subjects are:

- English Language
- Mathematics
- Social Studies
- Integrated Science
- Resource & Technology/Information Technology
- Spanish
- Geography
- Building Technology
- Chemistry
- Biology
- Physics

This is the most important and involved component of the project. The materials will include the development of the following for the eleven subjects at the five grades:

- Teachers' Instructional Manuals (TIMs)
 - Students' Instructional Manuals (SIMs)
 - Interactive software
 - A comprehensive videotaped lecture series by master teachers
 - A comprehensive In-Course Test Bank of questions and answers in an electronic mode to enable real time correction
- (ii) Provision of two computer labs in each school for teaching of all eleven subjects. Each lab will comprise 25 computers. This will include equipping schools with multi-media projectors to facilitate interactive presentations by teachers. Approximately 100 public libraries would also be equipped with computers and connected to the Internet. Support would be provided for an Educational Management Information System (EMIS) of the MOEYC to enable the Ministry to properly administer the education sector. Eleven (11) cable television channels will be dedicated to the transmission of the lecture series. One channel will be dedicated for the promotion and development of each subject.
- (iii) Teachers would be trained in the instructional materials, computer applications, interactive software and multimedia skills.
- (iv) Institute an **extensive remedial programme** based on voluntary inputs and the use of interactive software to buttress the effort of teachers, especially in the case of the newly up-graded high schools; and
- (v) Institute on a voluntary and phased basis a standard end-of-year **Pre-CXC Examination** in the eleven (11) subjects to measure school performance and assess project achievement.

The project will be implemented over three years, with the first year being a pilot phase involving twenty (20) schools. The other 130 schools would be addressed in years two and three. Learning from the pilot phase will inform the second phase.

The project is estimated to cost approximately US\$50 million. Funding will come mainly from a universal service obligation levy on the telecommunications sector as provided for under the Telecommunications Act 2000. A Ministerial Order has been signed and is being gazetted. The Order will take effect in May 2005. It is envisaged that development partners such as the International Telecommunication Union, UNESCO and others to be identified will provide additional support for the implementation of the project.

It should be noted that the planning of the e-Learning Project started from late 2003 and therefore pre-dated the commissioning of the Task Force work on Education. In finalizing the plan for the e-Learning Project, special attention was given to the recommendations contained in the Task Force Report to ensure harmony between the e-Learning Project and the work of the Task Force. The e-Learning Project should therefore be seen as a subset of the Task Force work on the “Transformation of Education” which encompasses a wider range of issues. It is expected that the Task Force Work will buttress and expand, where necessary, some of the components contained in the e-Learning Project consistent with the policy of “joined-up government”.

The International Telecommunication Union and the MOEYC have provided their final comments on the draft Feasibility Study for the e-Learning Project. These comments have been taken into consideration in the preparation of this the final version of the project document which will be used to guide implementation.

The e-Learning Project was presented to Cabinet and approved. The implementation of the project will be undertaken by a limited liability company to be known as “e-Learning Jamaica Ltd” or “e-LJam” for short. The Board of Directors of the Company was recently approved by Cabinet. Cabinet has also approved J\$50 M from the Technology Investment Fund (TIF) for the immediate commencement of implementation of the project. Office location has been identified and lease agreement is now being finalized. The Company will be located on the Ground Floor of the Petroleum Corporation’s Building at 36 Trafalgar Road, Kingston 10.

3 BRIEF COUNTRY PROFILE

Jamaica is an island nation in the northwest of the Caribbean Sea. With a population of approximately 2.6 million, it is the third largest of the Caribbean islands and has a surface area of 4,432 sq. miles (10,990 sq. km.). The island, which is located approximately six hundred and fifty miles southeast of the Florida peninsula in the U.S.A., is the largest English speaking territory in the Caribbean.

The political system is a stable multi-party democracy based on the British Westminster Model. There is a bicameral representative structure with an upper house of appointed representatives (the Senate) and a lower house of representatives (Parliament) elected on the basis of universal adult suffrage. The Head of State is the British Monarch who is represented locally by a Governor General. The Head of Government is a Prime Minister who typically also leads the political party that holds the majority in Parliament.

Jamaica is a founding member of the Caribbean Community and Common Market (CARICOM), a regional grouping for trade and co-operation. CARICOM came into effect on August 1, 1973 with a mandate to promote the integration of the economies of member states to coordinate the foreign policies of its independent members and to foster cooperation in various spheres of social and human endeavour.

Efforts at a deepening of the integration process are now underway with steps being taken to establish a Caribbean Single Market and Economy (CSME) whereby the regional grouping will function as “a single economic space” allowing for freedom of movement of economic resources, including labour, among the various territories. A proposed corollary to this is the establishment of a regional court, the Caribbean Court of Justice (CCJ) which will serve as a commercial court for the single economic jurisdiction and also as an appellate body.

Table 3.1 provides a summary of key human and economic indicators for Jamaica.

Table 3.1: Summary of Key Macro Economic Indicators

Jamaica Data Profile	
People	2002
Population, total	2.6 M
Population growth (annual %)	1.0
Life expectancy (years)	75.7
Fertility rate (births per woman)	2.3
Illiteracy total (% age 15 and over)	12.4
Illiteracy female (% age 15 and over)	8.6
Economy	
GNI (Atlas method) current US\$	7.4 B
GNI per capita (Atlas method) current US\$	2,820.0
GDP (current \$)	8.0 B
GDP growth (annual %)	1.0
GDP implicit price deflator (annual % growth)	7.1

Source: World Bank

4 OVERVIEW OF EDUCATION SECTOR

4.1 Priority of Education

The Government of Jamaica places a high priority on education. The Ministry of Education, Youth and Culture receives the largest portion of the Government's budget. For the 2003/2004 (to be updated) financial year, of a total Government budget of US\$1.38 billion (net of debt), approximately US\$0.38 billion is allocated to education. This represents over a quarter (27.4%) of the budget. Jamaica's allocation to education has been in the region of ten percent (10%) of GDP. Recently, the Government and the Opposition came to an agreement whereby there would be an increase in the education budget by one percent (1%) of GDP per annum for five (5) years with the objective of bringing the figure up to fifteen percent (15%) of GDP by the end of that period. However, while in percentage terms Jamaica's allocation to education is relatively high, the amount in absolute dollars is small and much lower than that of the country's main trading partners.

4.2 The Education System

The formal education system comprises four (4) levels: early childhood, primary, secondary and tertiary. Currently education is offered in one thousand (1,000) public institutions. Approximately seven hundred and one thousand (701,000) students are enrolled across the four (4) levels.

Table 4.1: Distribution of Public Education Institutions by School Type (2002/2003)

School Type	Number
Infant	29
Primary	356
All-Age	349
Primary and Junior High	88
Junior High	1
Special Schools	5
Secondary High	139
Technical High	14
Agricultural High	2
Tertiary	17
Total	1,000

(a) The Early Childhood Level

This level caters to children in the age group 3-5 years. There are approximately 117,600 children enrolled in 2,069 community operated basic schools. Additionally, there are over 15,000 students in 129 public infant schools and infant departments of primary, primary and junior high, and all age schools.

(b) The Primary Level

Primary education is provided for approximately 310,000 children in the age group 6-11 years of primary, all age and primary and junior high schools. (See Table 4.2 for a distribution of students in these schools by school type and sex.)

Table 4.2: Enrolment at the primary level by school type and sex (2002/2003)

School Type	Male	Female	Total
Primary	95,325	94,246	189,571
All Age (1-6)	38,873	32,681	69,554
Primary and Junior high	26,306	24,344	50,650
TOTAL	158,504	151,271	309,775

The educational offerings at the primary level take into account the special characteristics of children in the 6-11 age group. All Age schools provided basic education for many years but many of these schools were converted to primary in the 1960s when secondary education was expanded.

In 1998/99 the National Assessment Programme (NAP) was introduced to monitor the progress of children from grades 1-6. Primary education culminates with the Grade Six Achievement Test (GSAT) which is used to place students in the grade 7 of secondary level schools. The GSAT assesses students' Readiness Skills at grade 1, Diagnostic Test at grade 3, literacy at grade 4 and the following subjects at grade 6: Mathematics, Science, Language Arts and Social Studies.

(c) The Secondary Level

Secondary education is offered to students in the age group 12-16 years, in grades 7-11 and in some cases grades 7- 13. There are approximately 231,000 students enrolled in five types of secondary level institutions. See Table 4.3.

Table 4.3: Enrolment at the Secondary Level by School Type and Sex (2002/2003)

School Type	Male	Female	Total
All Age (Grade 7-9)	8,383	4,006	12,399
Primary and Junior High (7-9)	13,783	9,150	22,888
Secondary High	83,991	94,161	178,152
Technical High	8,510	8,924	17,434
Vocational/ Agricultural	218	158	376
Total	114,850	116,399	231,249

The secondary school system consists of two cycles. The first is provided in grades 7-9 of all age, primary and junior high, secondary high, technical high and independent high schools.

The second cycle is provided in grades 10 and 11 of these schools (with the exception of all age and junior high) and in the agricultural, technical and vocational schools. Some secondary schools continue to grade 13 where students are prepared for entry to tertiary institutions.

(d) Types of Secondary Level schools

(i) All Age Schools

All Age schools provide first cycle secondary education to students between the ages 12 and 14. The curriculum offering in the all age schools is mainly academic and no certification is offered at the end of grade 9. However, a few students gain access to upper secondary institutions through the Grade Nine Achievement Test (GNAT).

(ii) Primary and Junior High

These schools are the traditional All Age schools that have been upgraded in order to conform with government's policy to reform secondary education. The reform was made necessary due to the problems associated with access, quality and equity especially in the All Age schools. The Primary and Junior High schools offer both primary and first level secondary education. A new curriculum was developed for grades 7-9 of all secondary level institutions. It consists of five core subjects, career education and subjects that have been evaluated and revised in keeping with curriculum goals of relevance and creativity. The additional subjects include: Music, Physical Education, Religious Education, Spanish and Guidance and Counselling. At grade nine, students sit the Junior High School Certificate of Education (JHSCE), which allows for access to Secondary and Technical High Schools.

(iii) Secondary High Schools

These schools provide five or seven years of secondary education with access to them being through the Grade Six Achievement Test (GSAT), the Grade Nine Achievement Test (GNAT) and the Junior High School Certificate Examination (JHSCE). At Grade 11, students sit the external examinations administered by the Caribbean Examination Council (CXC), a regional body funded by several English-speaking Caribbean countries, as well as the General Certificate of Education (GCE) Examination. At grade 11 students would sit the CSEC in CXC (CXC/CSEC), Ordinary Level (GCE O'Level) or a combination of both. Secondary education ends at Grade 11 in some of these schools while others continue to Grade 13 (sixth form) where students sit the GCE Advanced Level ("A Level") in order to matriculate for entry to university and other tertiary institutions. In some schools, sixth form students sit the CXC Caribbean Advanced Proficiency Examination (CAPE). CAPE, like A Level, is a matriculation requirement for entry to university and other tertiary level institutions.

The curricula in these schools are greatly influenced by the external examinations administered at grades 11 and 13. Some secondary high schools offer mainly academic subjects while others offer academic subjects and a limited number of vocational subjects.

(iv) Technical High Schools

Entry to these schools is mainly through placement from GSAT and GNAT for three or five years. These schools provide education with a technical bias but the curriculum contains a mixture of technical and academic subjects. At grade 10 students may opt for a curriculum in Business Education, Industrial Education, Home Economics or Agriculture. At grade 11, students sit external examinations set by various examining bodies in the United Kingdom and the Caribbean Examinations Council as well as the local National Vocational Qualification of Jamaica (NVQJ) administered by the National Council for Technical and Vocational Education and Training (NCTVET).

(v) Vocational Schools

These schools offer specialized vocational education in agriculture. Entrants are mainly from All-Age, and Primary and Junior High schools through an Entrance Examination set by the schools in conjunction with the Ministry of Education, Youth and Culture. However, students from other secondary level schools may gain admission to these schools. In these schools, students are trained to enter the job market and are also qualified to access tertiary level education. There are three vocational schools which provide training in Agriculture or Home Economics.

(vi) Tertiary Education

Tertiary education is offered in a variety of public and private institutions differing in history, mission, and philosophy and to a lesser extent in programmes and structure as well as possessing varying degrees of autonomy. All were established in response to educational needs at different times and offer not only degrees but also certificates and diplomas. Tertiary level institutions include:

- The University of the West Indies
- The University of Technology (formerly College of Arts, Science and Technology)
- Northern Caribbean University
- Mico Teachers' College
- Bethlehem Moravian College
- St. Joseph Teachers' College
- Sam Sharp Teachers' College
- Moneague College
- Community Colleges
- Edna Manley School of the Visual and Performing Arts
- College of Agriculture, Science and Education (CASE)
- G. C. Foster College of Physical Education and Sports

At present, tertiary education is offered to over 27,000 students in public institutions. See Table 4.4. However, there are approximately 4,600 students in continuing education which is not considered tertiary.

**Table 4.4: Number of institutions, and distribution of enrolment at the tertiary level
(2002/2003)**

Institution	Number	Enrolment
Teachers' Colleges	5	3,741
Bethlehem Moravian College	1	1,730
Moneague College	1	892
Community Colleges	5	3,959
G.C. Foster College of Physical Education and Sports	1	348
Edna Manley College of the Visual & Performing Arts	1	387
College of Agriculture, Science and Education	1	1,437
Northern Caribbean University		
University of Technology	1	6,733
University of the West Indies	1	8,455
TOTAL	17	27,682

5.3 Other Institutional Infrastructure

In addition to the types of schools listed earlier, the country has other educational infrastructure with programmes and capacity that could support an ICT-based education initiative. The growing number and variety of educational and training facilities in place, both public and private, affords an effective platform for the development of ICT in support of education on a national scale.

(a) HEART/NTA

The Human Employment and Resource Training Institute/National Training Agency (HEART/NTA) is a public agency that coordinates a network of vocational institutions. HEART/NTA is playing a leading role in the development of the IT sector through financing initiatives for IT-related human resource and infrastructure development programmes. The agency is currently exploring possibilities for technical assistance from overseas institutions to help meet the demand for trainers. HEART/NTA also intends to complement its existing training methodologies with the introduction of distance and e-learning programmes.

(b) Caribbean Institute of Technology (CIT)

The CIT was established in 1999 as a mechanism for nurturing the development of an offshore software industry. This was in response to a confirmed shortage of resource personnel in the areas of programming, systems analysis and software engineering in the USA. In fulfillment of its mandate to help meet this demand through offshore locations, CIT has established partnerships with a number of institutions to provide technical and financial resources for training and certification. The partners include:

- HEART Trust/NTA

- The University of the West Indies (Mona School of Business)
- International Development Consortium (University of Herefordshire)
- Ministry of Commerce, Science and Technology (MCST)

CIT operates facilities in the capital Kingston and the Freeport area of the second city, Montego Bay.

(c) University of the West Indies Distance Teaching Enterprise (UWIDITE)

This facility, formerly referred to as the University of the West Indies Distance Teaching Experiment, was instituted in 1982-1983 by means of financing from a USAID grant. It consists of a regional network of eighteen (18) off-campus learning centers, each of which is equipped with basic audio technologies together with slow scan television systems and typewriters for on line use. Audiotapes, VCR's and monitors are also available to provide offline teaching support. Hence, through UWIDITE, the UWI is both an innovator and significant user of telecommunications, not only in Jamaica, but throughout the entire English speaking Caribbean region.

(d) University of Technology (UTECH)

UTECH is the only technical university in the English-speaking Caribbean and as such, while catering to national requirements, also extends its reach beyond Jamaica where possible. In pursuit of the latter, the UTECH Virtual Learning (UVL) for online distance learning has been established. This is an international cooperative pilot venture financed by the European Union (EU) and is the first virtual classroom to be established at that institution. In addition to this initiative, UTECH is also currently piloting online linkages with community colleges. It offers its programmes under franchise arrangements and by so doing, links its off-campus students with its library and other learning resources.

(e) Northern Caribbean University (NCU)

This is a private university located in central Jamaica and offers a programme designed to impart knowledge in all branches of science, business and the humanities. Specifically, NCU offers courses in Computer Science, Information Science and Information Technology.

(f) Mico College

At present Mico is poised to continue to play a critical role in distance education and open learning through its human resources as well as the infrastructure. The college has a core of staff trained in Instructional Technology and Distance Education (ITDE) in teacher training institutions in Jamaica including 9 persons with master's degree in ITDE, 6 persons with doctoral degrees in ITDE with other members in the process of completing graduate degree programmes in ITDE. Ninety percent (90%) of staff have Masters level degrees in pedagogy and forty (40) members of staff have experience and expertise in the writing of instructional modules for distance teaching and learning.

These areas of specialty are bolstered by staff with expertise and teaching experience in critical subject areas for secondary schools such as languages, science and mathematics.

The College also offers a wide range of programmes and services which are important for learner support and which are essential to the effectiveness of distance teaching and open learning.

(g) Other Institutions

A number of private institutions across Jamaica offer IT-related programmes including Microsoft, Novell and CISCO certified courses.

5 INFORMATION AND COMMUNICATIONS TECHNOLOGY (ICT) IN EDUCATION

5.1 Overview of Telecommunications Sector

Jamaica's ICT Sector has made significant strides in recent years, following the passage of the Telecommunications Act in 2000, which placed the process of liberalization of the sector on a legal footing. The opening up of the sector has been characterised by a consistent increase in the variety and reach of services, the number of customers and levels of investment.

This has been facilitated by the structured legislative framework and licensing procedures, under-girded by a consensus-driven policy that seeks to ensure efficiency and fair competition and maximize access to ICT's by application of the following fundamental principles:

- Competition
- Universal access and service
- Neutrality of technology
- Promotion of ICT
- Independent regulation

Under the Telecommunications Act of 2000, a three-phased process of liberalization was implemented culminating in March 2003 with the removal of all legal impediments to free competition in the industry.

Under Phase I, which commenced on March 1, 2000, the following areas were opened up to competition:

- Domestic wireless cellular services
- The market for the provision of customer equipment
- The market for resale of data, international voice and Internet access
- Companies with Single Entity Free Zone status able to provide own telecommunications services.

Phase II commenced on September 1, 2001 and covered:

- Competition in domestic facilities and services
- Subscriber Television Operators (STVO's) permitted to become Internet Service Providers (ISP's)

Phase III took effect on March 1, 2003 and allowed for:

- All telecommunications facilities, including international voice and data services, to be open to market competition.

Work is in progress towards a revised Telecommunications Act, which will provide for, inter alia:

- How local telephone service carriers including STVO's can enter and compete in the market
- How the rights of consumers will be protected as liberalization proceeds
- How Universal Access will be applied in the build-out of networks and the roll-out of new services

5.2 Sectoral Performance

The single most outstanding growth area has been mobile telecommunications and the number of subscribers to mobile telephone services is currently estimated at 1.6 million (in a population of 2.6 million). The period has seen a decline in the number of fixed lines. Table 5.1 shows telephone subscribers by category (number of lines) for 1999 through 2002.

Table 5.1: Number of Telephones (1999 – 2002)

Phone Type	1999	2000	2001	2002
Land Lines	493,523	507,107	511,302	432,772
Mobile	117,861	249,842	640,453	1,187,293

Data for December 2003 indicate that the combined total of landlines and mobile phones was approximately 1.8 million. It is estimated that by itself, the cellular market could potentially allow for 1.8 million mobile solutions before saturation.

As evidence of the range of telecommunication services available in Jamaica, just under three hundred (300) licenses had been issued to service providers in ten (10) categories since 2000. Table 5.2 provides details of licenses issued by category of service provider between January 1, 2000 and October 31, 2003.

Table 5.2: Number and Type of Licenses Issued (2000 – 2003)

Type of LICENCE	TOTAL
ISP	59
ISP (STVO)	7
IVSP	5
DC	26
DVSP	35
DSP	28
FTZC	10
FTZSP	8
IC	45
INT'L SP	35
TOTAL	298

Key:

DC - Domestic Carrier

DSP – Data Service Provider

FTZC – Free Trade Zone Carrier

FTZSP – Free Trade Zone Service Provider

IVSP – International Voice Service Provider

DVSP – Domestic Voice service Provider

ISP – Internet Service Provider

ISP (STVO) – Internet Service Provider for Subscriber television Operations

IC – International (Voice/Data/Transit) Carrier

INT'L SP – International (Voice/Data) Service Provider

A number of innovative IT-based services/products have also come on stream in both the public and private sectors. These include an online multi-payment facility for settling consumer utility and other bills on behalf of over thirty (30) client companies, online facilities at post offices and a computerised network that facilitates automated procedures at the loading racks of the national petroleum marketing company.

Up to 2002, the level of investment in the ICT sector by the two leading telecommunications service providers was estimated at over US\$500 million. This is in addition to investments from various other providers of ICT services.

Consistent with the principle of Universal Access enshrined in the national Telecommunications Policy, the Government is striving to increase opportunities for access and connectivity to ICT infrastructure. Particular measures include provision of computers for schools and libraries and the creation of online post offices that offer a range of non-traditional services from bill payment to community bulletin boards as mentioned above. The last mentioned facility is being made possible through a commercialisation drive entailing inter alia, partnership agreements with major private sector players.

The MCST is of the view that major strides have been made in tele-density and universal access with respect to voice telephony. **Hence, the Ministry now wishes to shift its strategic focus from universal service with respect to voice telephony to universal service with respect data transmission or information dissemination via the Internet to create an educated and knowledge-based society.** The Ministry believes that it is critical that the country harnesses the

potential of ICT as a means of building national capacity in education and business competitiveness to enable its survival in an environment of globalisation of markets. In the case of education, ICT can play an integral role in reaching the tens of thousands of youngsters who are outside of the formal education system without any recognisable qualification.

The Government is also acutely aware that in a growingly knowledge-driven milieu and the coming of a CSME and FTAA, the only way to gain a competitive edge and maintain/gain market share is to mass educate the population. With the current educational level, there is fear that the approaching increased liberalization of the markets could see further loss of market share and increased unemployment. Jobs that are likely to emerge will be at the upper end of the market. This could aggravate the already skewed income distribution and joblessness at the lower end and lay the foundation for perpetual social unrest.

Mass education and significant improvement in the quality of education are seen by the MCST as critical for competitive advantage and economic and social stability in the future. Unfortunately, the Government is constrained in the short-run to allocate the required level of resources to adequately address this critical need. The Ministry is therefore using universal access to data in a targeted and strategic way to buttress critical needs in secondary education as its contribution to the priority policy of the government in creating an educated and knowledge-based society.

5.3 Access to Internet

The vast majority of the high schools has access to fixed line telephone service and can therefore gain access to the Internet. Those that do not have fixed line telephone service can gain access via wireless technology. Schools that do not have access to the Internet do not see this as a priority largely due to budgetary constraint. The telecommunication companies such as Cable and Wireless and Digicel are pursuing their own initiatives to provide the schools and libraries access to the Internet.

Hence, the MCST does not see access of the high schools to the Internet as an issue. The major challenge has to do with the availability of bandwidth and budgetary resources for the schools to pay for Internet service. The MCST has recently awarded two licences for submarine fiber optic cable to expand the bandwidth capacity of the country. The MCST is therefore of the view that in a short while the fees for access to the Internet will fall significantly and access of schools and households to the Internet should increase.

5.4 USAID IT Project

The USAID is currently funding an education information technology project in the Caribbean of which Jamaica is one of the beneficiaries. Under the project which focuses on reading at the primary level, the Joint Board of Teacher Education (JTBE) at the University of the West Indies, Mona, Jamaica is being linked to the MOEYC and 150 primary schools island-wide via wireless technology. The view is that this infrastructure could be expanded to include the high 150 schools which constitute the focus of the e-Learning Project.

6 CHALLENGES IN EDUCATION AND PROJECT JUSTIFICATION

6.1 Challenges in Education

(a) Resource Constraint

The Government is fully aware of the importance of education in national development as the education sector currently receives the largest percentage of the budget with the exception of debt service. The main challenge is that **per capita allocation is low** due to the relatively low GDP and the high debt burden. Hence, while the Government is fully committed to education, there is a major resource constraint. This is particularly so in the case of recurrent expenditure. In the case of capital, while the Government is able to access loans and grants through multilateral and bilateral funding arrangements, the lack of local counterpart funding also limits the amount of funds that can be accessed from these external sources.

The low recurrent budget impacts negatively particularly on the remuneration of teachers. As a consequence, the classroom has difficulty attracting and retaining the brightest graduates coming out of the education system. Many of the teachers in the classroom are there not for the remuneration but for a love of the profession and dedication to national development. Salary increases to teachers are not likely to improve in the short run given the country's debt burden. The low income of teachers could lead to attrition among the more qualified, experienced and enterprising ones, resulting in a worsening of the situation. Some teachers have been migrating to the USA, Canada and the United Kingdom where their earning potential is significantly higher. This is of concern to the Government as educational standards could decline even further.

The budgetary constraint also impacts negatively on the ability of schools to purchase basic teaching supplies and meet necessary repairs and maintenance. These factors are very demotivating to teachers and impact negatively on the quality of teaching and level of passes in examinations.

(b) Wide Disparity in Standards among Schools

With a loan from the World Bank, the Government is implementing a major project entitled "Reform of Secondary Education" (ROSE). This project commenced in the mid 1990's and has been extended to a Phase 2. An important objective of the project is to increase access and equity in schools. One key intervention was to standardize the curriculum from Grades 7 – 9 in all schools. This has been completed and Grades 10 and 11 are now being addressed. The reasoning was that whichever school a student attends, there would be equity since all students would be doing the same curriculum. The expectation was that standards across all schools at the Grades 7-9 would be approximately equivalent. However, even though the curriculum has been standardized, major disparity still exists among schools in terms of their performance. The result is that parents make a lot of effort in getting their children into the traditional high schools, which it is felt, have better teachers and administrative systems. This tendency of course means that the traditional high schools receive the best performing students from the GSAT Exams. Following the GSAT Exams, it is quite common for parents who are education-conscious and

whose children did gain entry to the traditional high schools, to seek transfers. Hence there would be a positive correlation between poor performing students coming from homes with low priority on education and placement in the newly upgraded high schools.

The Government is concerned about the concentration of the best performing children from the GSAT Exams in the traditional high schools. Consideration is therefore being given for students to be allocated to schools based on geographic proximity and other criteria to ensure that some of the better performing students also attend the newly upgraded high schools. This is likely to be a highly contentious issue. It could also pose new challenges to schools, as classes will be more heterogeneous, frustrating both the best performing and under achieving students alike. The more heterogeneous the class, the more difficult it will be for the teachers to find an appropriate level to pitch their lessons.

(c) Absence of Standard Instructional Materials for Teachers

Currently teachers have to develop their own detailed instructional teaching notes, lessons plans, teaching methodologies, teaching aids and so on. Some principals and teachers complain about the lack of a **common core** of high quality contents free from the restrictions of copyright to address the difficulties faced by teachers. Teachers therefore have to learn through a process of trial and error in the development of detailed teaching notes and this is to the detriment of their students. There is a felt need among teachers for a standard instructional package in each subject for each grade which a school could provide to its teachers to ensure that certain minimum and basic standards are met by all teachers, especially in the cases of inexperienced and untrained teachers.

Parents are often very concerned when experienced teachers leave the system and inexperienced ones have to replace them, as contents vary significantly. Where inexperienced teachers are using the classroom as a mere “stepping stone” to other more desirable jobs, the situation is even worse as they are not inclined to invest the time and effort to develop proper instructional materials since they see their tenure as only transitory. Some teachers complain about the time it takes to conduct proper research in order to develop well-organized and well structured instructional materials. They also complain about the lack of a central resource center from which they could get materials and clarifications when needed. Some teachers explained that in the case of some of the new teachers entering the class room for the first time, there are several factors that render it challenging for them to have adequate time to conduct the required research to develop high quality instructional materials. These factors include:

- the pressure of teaching high contact hours per week
- high pupil-teacher ratio
- coping with indiscipline students in noisy and over-crowded classrooms which reduce effective teaching time and delivery efficiency
- marking papers of poor performers, which takes more time
- extensive remedial work in the case of some of the newly upgraded high schools

Moreover, due to attrition during the year, some teachers end up teaching subjects for which they do not have proper instructional materials and for which they have not been specifically trained. The result is that they simply “plod” through the term and gradually develop the contents as they

go along. That batch of students undoubtedly suffers and carries that weakness in the subject through to subsequent grades.

Inexperienced teachers do not benefit much from national and **international best practices** in **what** to teach. They have to gradually build up this resource/content over time. It can therefore be expected that some would take a long time to climb the learning curve before they become competent. The more dedicated teachers would gradually build up proper content and fine-tune their instructional methodologies for certain topics over time. Where a teacher instructs more than one grade and does not have clearly differentiated instructional materials by grade, there could be a tendency for a “one size fits all” approach. Thus although teachers receive the same standard of training in the training colleges, and use the same ROSE curriculum, performance is highly variable among grades 7-9 across schools.

(d) Inadequate Instructional Materials for Students

Low income levels means that children of some parents do not have timely access to prescribed texts. Although many schools operate a text book rental system, parents still have to purchase some texts. More importantly, changes in editions, as authors and publishers repackage their contents rendering earlier versions obsolete, means that millions of dollars worth of texts become obsolete as children adopt later versions. Many times changes are only cosmetic in nature and really amount to a marketing strategy to increase sales. **Basic knowledge at high school level is relatively stable** and does not warrant the degree of revision in expensive texts which is costly to the country. New knowledge at high school level can be provided by the teacher who must keep abreast with new developments in the subject area.

In addition, many schools prescribe texts which are inadequately utilized as the teachers do not have enough lead time to re-orient their teaching notes to match the new texts. This problem is compounded if the texts become available late in the term. The result is that there is little synchrony between texts and teaching notes of the teacher. Proper harmony between teaching notes and student instructional materials facilitates pre-reading by students with the teacher acting more as a facilitator clarifying issues and paying special attention to weaker students.

In a country where foreign exchange inflows are inadequate to maintain exchange rate stability, domestic interest rates are prohibitively high, per capita income is low and the level of education below acceptable standards, **this artificial obsolescence of texts constitutes a major economic waste**.

In order for the Government to achieve its policy objective of creating a **knowledge-based society**, **basic high school instructional materials** must be **inexpensive** and **easily accessible to all**, especially the poor.

(e) Absence of Standard Assessment System

While the Government has standardized the curriculum between Grades 7 – 9 and is now focusing on Grades 10 and 11, there is no standard assessment to identify poor performance early so that corrective action can be taken on a timely basis. Each school still sets its own

examination. In the case of the traditional high schools, their examinations tend to be of a higher standard than those of the newly upgraded high schools and all-age schools. The tendency is for schools to set their examinations consistent with the **level** of their students and this obviously masks the problem until the students are ready to take the CSEC Exam. This is a major flaw in the system especially at the secondary level. A national end-of-year examination at each grade between 7-10 could serve as a rigorous early warning signal to facilitate timely corrective action before it is too late. The lack of this critical early warning signal means that many schools, students and parents exist in a world of illusion for five years!

The early warning signal would allow for corrective action to be taken by students, parents and schools. Such actions could include the following:

- (i) mandatory remedial classes during the term for weak students;
- (ii) mandatory remedial classes during the summer holidays to bring weak students up to required standard;
- (iii) parents organizing and paying for remedial classes conducted in the evenings and on week-ends;
- (iv) the school providing coaching/guidance sessions for parents with poor performing students; and
- (v) sanctions for parents who can afford to assist their children but neglect this responsibility.

While there is the Junior High School Certificate Examination (JHSCE) at the end of Grade 9, schools complain that the results are often available very late, not affording them adequate time for remedial action before the students are required to sit the CXC/CSEC Examinations. Also, the JHSCE is perceived to be a substandard exam and is not taken by some traditional high schools which consider it to be below their level.

The absence of a standard end-of-year high school examination at each grade of an acceptable level means that there is no common yardstick to compare the performance of all high schools prior to the CXC/CSEC Examination. Poor performance is therefore masked and not exposed from early so that all stakeholders can be sensitized and resources mobilized solve the problem.

A national high standard end-of-year high school examination at each grade would serve to identify poor performers early so that systems can be devised to implement timely corrective action especially between grades 7-9.

(f) Inefficient Teaching Methodologies

Resource constraints impact negatively on teaching methodologies and technologies. Few schools routinely employ modern technologies such as multimedia machines and computers in their teaching. In the case of computers, if a computer lab exists it is used mainly to teach information technology rather than being used as a tool in the teaching of the full range of subjects. Teaching is therefore very inefficient and learning is unappealing. There is no doubt that learning can be improved if teachers are able to conduct their classes employing modern multimedia and interactive computer technologies which make learning more interesting and

exciting. This would be particularly helpful to boys whose performance is generally weaker than girls' and who probably find music and sports more appealing.

(g) Low Level of Parental Support

Many students who do well in the GSAT and CXC exams come from homes where the parents are conscious about the importance of education. However, those parents tend to be more educated and are probably in the minority. Some students in schools are from homes where:

- (i) parents have limited education;
- (ii) parents put limited priority on education;
- (iii) parents are not conscious of the responsibility of parenting;
- (iv) children live with other relatives who do not provide the level of home work support required;
- (v) there are only single parents and or where family structure is fragmented and unstable; and
- (vi) parents are financially constrained.

In some cases, children receive little or no parental support with homework and performance in school is not monitored to ensure that acceptable standards are maintained. In the final analysis, even if children in such environments gain access to high school, they often perform poorly in school-leaving exams or worse yet may not qualify to take such exams. Many schools are not inclined to send improperly prepared students for say the CSEC exams, as this will lower the school average and public image.

(h) Poor Discipline among Students

The generally poor discipline among students is almost attaining crisis proportions. Uncivil and violent behaviour directed even at teachers is rampant and teachers find it extremely challenging to teach as a significant amount of their time is spent controlling students. This low level of discipline can be attributable to poor socialization and the dysfunctional homes from which many of the children come. A related factor is that many students also lack a sense of purpose for going to school. Poor discipline is one of the most important factors contributing to poor performance and the inadequacy of learning in the classroom.

Greater effort needs to be placed on improving discipline in schools to enhance the efficiency of teaching and learning. Creative means with the requisite sanctions and penalties need to be explored to ensure that parents pay greater attention to parenting. One approach could be to require parents whose children display high level of indiscipline/antisocial behaviour to attend mandatory counseling/parenting classes with penalty enshrined in statute for non-compliance. One Caribbean country is now implementing this measure to improve discipline in schools.

Parents could also be required to guarantee the discipline/behaviour/conduct of their children at school and also to provide certificates of parenting if their children are to gain acceptance to certain designated high schools. Where parents are unable to meet this criterion, students could be required to attend specially designated high schools staffed with adequate professionals and specially designed socialization programme(s) as a part of the curriculum, with some cost passed

on to parents based on affordability. This could be implemented from the primary school level to correct weaknesses early before the children reach high school age.

(i) Shift System

Under the shift system, the school accommodates one set of students in the morning and another in the afternoon. This is an initiative of the Government to increase the number of high school places, but for various reasons, many schools are dissatisfied with the shift system. However, there is no easy solution to this challenge in the short term in light of the need for the country to increase access to high school.

(j) Class Size

While the class size (pupil-teacher ratio) is small in some schools and the overall country average may be acceptable, many schools have very large class size, which makes teaching and learning difficult. This is a challenging issue and will require vast amounts of resources to address. The short to medium term solution will have to be to increase the quality of teaching in the weaker schools so that the education conscious parents will not move their children to other schools.

6.2 Relatively Poor Performance of Students

The foregoing challenges, among others, contribute to the less than acceptable performance of students. The result is that tens of thousands of school leavers join the labour market each year without any competitive qualification and are unsuitable for the world of work. Table 6.1 shows the number of students sitting the Regional CXC/CSEC Examinations for selected subjects.

Table 6.1: Number of Students Sitting the Regional CXC/CSEC Exams

Subject	1998	1999	2000	2001	2002
Arts/ Language					
English A (Language)	18168	17318	18316	18768	19638
Social Studies	5615	6218	7056	7204	8295
Caribbean History	4782	4752	5055	4822	4746
English B (Literature)	6709	6763	6767	6823	6662
French	424	434	449	509	506
Spanish	2059	2032	2280	2546	2567
Religious Education	1645	1761	1848	1869	1967
Geography	3318	3430	3377	3701	3617
Music	0	20	34	42	44
Sciences:					
Biology	3066	3246	3696	3610	3779
Chemistry	1997	2296	2471	2469	2646
Physics	1924	2188	2368	2502	2509
Integrated Science 1	1709	1949	2473	2821	3407
Mathematics	16854	16038	16095	16558	17124

As will be observed from the above table, English and Mathematics are acknowledged to be the most important subjects and are taken by most students. Close to twenty thousand (20,000) students sit the English exam while over seventeen thousand (17,000) sit Mathematics. Table 6.2 shows the pass rate for the foregoing subjects.

Table 6.2: Percentage Pass Rate for Selected Subjects in Regional CXC Exams (Grades 1 – 3)

Subjects	1998	1999	2000	2001	2002
Arts/ Language					
English A	41.0	41.2	47.9	57.9	53.7
Social Studies	57.8	60.3	50.7	72.1	79.6
Caribbean History	70.3	72.6	70.0	67.8	77.3
English B	55.0	52.4	56.2	48.8	58.2
French	48.1	61.1	52.3	61.3	74.1
Spanish	55.3	67.0	65.5	66.9	68.3
Religious Education	79.8	83.1	84.5	86.6	75.5
Geography	60.9	67.7	68.0	60.3	72.9
Music	-	75.0	41.2	42.9	59.1
Sciences:					
Biology	50.8	51.5	47.9	53.5	55.7
Chemistry	52.5	41.4	48.4	42.5	49.6
Physics	43.2	38.2	39.3	43.4	53.4
Integrated Science 1	76.7	73.3	74.5	84.8	69.2
Mathematics	26.1	26.8	37.4	30.3	36

The data show that for the two (2) most important subjects (English and Mathematics), the pass rates are the lowest. In the case of English the pass rates range from just over forty percent (40%) to approximately fifty-eight percent (58%) over the period 1998 to 2002. Mathematics is worse with pass rates of just about a third. These two (2) subjects are critical for students to go on to tertiary training and gain employment.

Table 6.3 Grade 11 Cohort Enrolled in the Secondary Schools

Categories	Year 1998/1999	Year 1999/2000	Year 2000/2001	Year 2001/2002	Year 2002/2003
Total Grade 11 Cohort*	33,947	36,578	36,436	37,061	37,240
Students passing CXC English Language as a percentage of Grade 11 Cohort	22%	19.5%	24%	29.3%	28.3%

*Source: Ministry of Education, Youth and Culture

Note: The figures do not include passes for the GCE.

English Language is the most popular subject taken by students.

Table 6.3 shows the grade 11 cohort or total number of students enrolled in secondary schools and potentially eligible to sit the CXC/CSEC Examinations. The enrolment numbers include the comprehensive high schools which were upgraded to secondary high schools in 2000/2001, the secondary and technical/vocational /agricultural high schools.

So for example, in 2002, 19638 students at grade 11 sat the CXC/CSEC Examination for English Language out of a potential 37,240 students which were enrolled in 2002/03. English Language is the most popular subject with the most students sitting the examination. Of those who sat this examination, the pass rate was 53.7% or 10,545 students. Therefore the number of students who passed English Language was approximately 28% of the total grade 11 cohort of 37,240. It should be noted however that students from some schools would have done the English Language in the England-based General Certificate of Education (GCE). Those figures are not available here.

6.3 Rationale/Justification for Intervention

Against the background of low pass rates in the Regional CSEC Examinations, and the small percentage of students from the newly upgraded high schools demonstrating readiness for this exam, thousands of students are entering the labour market from the school system without proper academic qualifications. In addition, there are thousands of students who do not make it to high school. The high failure rate among students dictates that initiatives be implemented to improve performance of students in high schools.

In terms of gender, the vast majority of the students failing in school are boys. Girls perform far better and now account for close to seventy percent (70%) of enrolment at the University of the West Indies. The boys are therefore significantly marginalized and find it difficult to access certain employment. It appears that many of them turn to drugs and crime, creating major security and law enforcement problems in the country. The current situation is not sustainable and poses a serious threat to long term social order.

7 PROJECT DESIGN AND DESCRIPTION

7.1 Vision

The vision of the Government is to have an educated and knowledge-based society and an economy that is internationally competitive, that affords the citizenry a comparatively high standard of living. This project is one of several being employed by the Government intended to contribute to the vision of creating an educated and knowledge-based society.

7.2 Project Design/Logical Framework

Table 7.1 shows a logical framework for the Project, outlining the main design features.

Table 7.1: Summary Logical Framework

<u>Narrative Summary</u>	<u>Objectively Verifiable Indicators</u>	<u>Means of Verification</u>	<u>Critical Assumptions</u>
<p>Goal: Contribute to the creation of an educated and knowledge-based society that is internationally competitive</p>	<p>(a) Percent pass rate in Regional CXC and other exams in the selected subjects (b) No. of “out of school students” pursue training</p>	<p>(a) CXC/CSEC Exam results (b) Pre-CXC/CSEC Exam results (c) In-Course Test Results</p>	<p>(a) Training and materials are revised and kept up-to-date on an on-going basis.</p>
<p>Purpose: Improve the quality of education in the high schools.</p>	<p>Percent pass rate in Regional CXC/CSEC, Pre-CXC and other exams in the selected subjects</p>	<p>(a) CXC/CSEC Exam results (b) Pre-CXC/CSEC Exam results (c) In-Course Test Results</p>	
<p>Outputs: (a) Instructional materials developed in various digital formats for 11 subjects covering grades 7-11 and extensively used. Interactive computer software procured and/or developed for certain difficult topics. (b) Teachers in all high schools oriented/trained in the use of new instructional materials and equipment. (c) The approximately 150 high schools equipped with computers and</p>	<p>(a) Number of subjects for which materials were developed. (b) Number of different media on which materials were put. (c) Number of teachers trained in pilot (d) Number of students trained in pilot (e) Satisfaction of students with materials (f) Satisfaction of</p>	<p>(a) Project records (b) Project records (c) Project records (d) Project records (e) Sample survey (f) Sample survey</p>	<p>(a) Publishers do not perceive the core training materials as reducing demand for some of their texts. (b) Schools are unable to properly utilize the</p>

<p>multimedia machines. MOEYC EMIS improved and facilitates better administration of the education sector. Approximately 100 public libraries equipped with computers and connected to the Internet. Eleven (11) cable television channels established (one to two for each subject), transmitting high school contents and making positive impact on quality of education.</p> <p>(d) Extensive national remedial programme in place and functioning effectively.</p> <p>(e) National Pre-CXC/CSEC Exam replaced individual school end-of-year exams and accepted as objective means of measuring performance of high schools.</p>	<p>teachers with materials</p> <p>(g) Number of students who use materials</p> <p>(h) Number of teachers who use materials as main materials used.</p> <p>(i) Pass rate in exams</p>	<p>(g) Sample survey</p> <p>(h) Sample survey</p> <p>(i) School records</p>	<p>electronic versions of the materials due to limited computer and other electronic devices.</p> <p>(c) Students have limited access to electronic devices to benefit fully from the electronic versions of the content.</p>
<p>Inputs (Main Project Components)</p> <p>(i) Develop instructional materials, lecture series, etc. in 11 subjects</p> <p>(ii) Train teachers</p> <p>(iii) Provision of equipment to schools, MOEYC, public libraries, Project Management Unit and establish educational channels</p> <p>(iv) Institute national remedial programme</p> <p>(v) Institute national assessment system</p>	<p>(a) Budgetary resources</p>	<p>(a) Project records</p>	<p>(a) Budgetary resources are provided on a timely basis.</p>

Note: This Logical Framework will be revised by the Project Management Unit and other stakeholders prior to project implementation. Final targets agreed then will form the basis for monitoring project performance.

7.3 Project Purpose

The purpose of the Project is to improve the **quality** of education in the high schools between grades 7-11 in eleven (11) designated subjects. Other subjects will be considered subsequently. The improvement in quality will be **objectively measured** by the performance of the schools in a **VOLUNTARY** standard end-of-year Pre-CXC/CSEC Examination for grades 7-10 and in the Regional CXC/CSEC Examination at grade eleven (11).

7.4 Constraints

The project is intended to address **five (5) specific constraints** which impact adversely on the quality of education in the high schools. Other constraints are being addressed or will be addressed by other interventions by the MOEYC. The five constraints are as follows:

- (i) lack of a comprehensive and detailed set of standard instructional materials for use by teachers (especially young and experienced teachers) and students;
- (ii) low level of skills among teachers in the use of modern technologies such as interactive software in the teaching of “hard to grasp” topics to stimulate interest among students, especially boys;
- (iii) inadequate equipment in schools to enhance teaching and learning using modern technologies and lack of a proper educational management information system (EMIS) in the MOEYC to facilitate effective administration of the education sector;
- (iv) inadequate remedial programme especially at Grade 7 to enable students to cope with high school work, particularly among some newly upgraded high schools; and
- (v) lack of a standard high school examination to **objectively measure performance** of
 - **students**
 - **teachers** and
 - **schools**
 at **each grade** across the high schools to facilitate **targeted** and **timely** interventions and **affirmative action**.

These are the areas in which the MCST will offer support to the MOEYC. The objectives of the project and the design of the project components revolve around these five (5) constraints. In designing the project components, the guiding principle was to avoid duplication of any existing programme or “re-invention of the wheel.” Instead the objective has been to find the “gaps” in current programmes and to design cost-effective strategies to “plug” those “gaps.”

7.5 Specific Project Objectives

The specific objectives of the project are as follows:

- (i) To improve the quality, availability and ease of access to **digital instructional materials** by teachers and students in eleven (11) designated subjects. This will include the following:
 - teachers’ instructional manuals for each subject at each grade
 - students’ instructional manuals for each subject at each grade
 - interactive educational software for each subject at each grade
 - videotaped lecture series done by master teachers for each subject at each grade
 - comprehensive set of multiple choice questions and answers and also extended written questions and model answers for each subject at each grade
- (ii) To increase the availability and use of **modern equipment and technologies** in schools, public libraries and the MOEYC. This will include:
 - establishment of an Education Management Information System (EMIS) for the MOEYC

- establishment of technology learning centres/computer laboratories in each school
 - provision of multimedia projectors and laptops
 - connect schools to the Internet
 - provide computers to public libraries and connect them to the Internet
- (iii) To **orient/train teachers** in the use of the instructional materials and new technologies provided;
- (iv) To institute an **extensive remedial programme** based on voluntary inputs and the use of modern technologies to buttress the effort of teachers, especially in the case of the newly up-graded high schools; and
- (v) To institute on a voluntary and phased basis a standard end-of-year **Pre-CXC Examination** in eleven (11) subjects to measure school performance and assess project achievement.

An important focus of the Project will be the use of information technology to enhance learning. It should be emphasized however, that the objective of the project is **not** to test the effectiveness of certain technologies in facilitating teaching and learning. This is already well established. The project is therefore intended to draw on proven international best practices with technologies and apply such technologies to improve learning. Of course, impact will be evaluated as implementation progresses and modifications made as necessary based on local experiences.

7.6 Target Beneficiaries/Group

The target group which is expected to benefit from the project consists of students in **grades 7 – 11 (Forms 1 – 5) in the approximately 150 high school** island-wide. As indicated earlier, the decision on the target group is based on a policy directive of the Hon. Minister of Education, Youth and Culture.

7.7 Project Description

The purpose/objective of the project is to improve the quality of education in the approximately 150 high schools drawing on the use of information technology. The project will involve the improvement of the educational management information system (EMIS) infrastructure of the MOEYC to enable the ministry to effectively administer the education sector and very importantly to integrate the use of technology in key aspects of the delivery of education in the high schools.

The project will re-purpose and develop different types of instructional materials for teachers and students and package these in various digital formats such as CDs, DVDs, and so on. Interactive software would be acquired and/or developed to address certain “hard to teach or learn” topics. The Government will own the copyright to all materials developed so that schools will be able reproduce freely and provide to teachers and students without being constrained by copyright

restrictions or recurrent expenses of licences. Instructional materials will be for eleven (11) subjects ranging from grades 7-11.

Master teachers will be used to present lecture series in each subject at each grade. The lecture series will be videotaped and packaged on DVDs and other relevant media. The lecture series will be presented to schools where they will be shown on multimedia machines to supplement the teaching in the classroom. Students will also be able to borrow lecture series from the school library for viewing at home. Eleven (11) specialist cable TV channels will be dedicated to education – approximately one channel per subject. The lecture series would be transmitted via the cable channels with repeat transmission for flexible viewing.

Schools will be provided with computers and multimedia machines to improve the quality of teaching. Teachers will be oriented in the use of the new digital instructional materials and in the use of the equipment.

An extensive remedial programme will be implemented using interactive software to improve reading and other weaknesses of students coming into the high schools. This programme will involve a large voluntary input from citizens.

Most importantly the project will institute a standard end-of-year examination referred to as the Pre-CXC/CSEC Examination across all high schools from grades 7-10. At grade 11 students would sit the Regional CXC/CSEC Examination. The end-of-year exam will be the instrument used to monitor project performance across all schools with respect to improvement in the quality of education which is the primary objective of the project.

7.8 Key Project Outputs

The outputs of the project will be largely dependent on availability of funding. Assuming availability and timing of funds are not a constraint; the outputs according to each component within the three years are summarized in Table 7.2.

Table 7.2: Summary of Key Project Outputs by Project Component

2005/06 – 2007/08
(a) Development of Instructional Materials:
(i) Teachers' Instructional Manuals (TIMs) in 11 subjects for each grade from 7-11 developed and provided to schools
(ii) Students' Instructional Manuals (SIMs) in 11 subjects for each grade from 7-11 developed and provided to schools
(iii) Interactive software in the 11 subjects for each grade from 7-11 developed and/or procured and provided to schools
(iv) Lectures in 11 subjects for each grade from 7-11 videotaped using master teachers and provided to schools
(v) Laboratory experiments in integrated science, biology, chemistry and physics for each grade from 7-11 videotaped and provided to schools along with simulation software
(vi) Bank of questions and answers (In-School Test Bank) covering 11 subjects for each grade from 7-11 developed and provided to schools
(b) Provision of Equipment/Technologies
(i) Average of two technology learning centres comprising 25 computers each established in each school and connected to the Internet
(ii) An average of 5 multi-media projectors and laptop computers provided to each school
(iii) One interactive educational channel (EDU-TV) established by the MOEYC
(iv) Eleven (11) educational cable television channels established and operating
(v) Educational Management Information System (EMIS) established in MOEYC
(vi) Approximately 100 public libraries received computers and access to the Internet
(c) Training of Teachers
(i) Some teachers in all high schools trained in use of new instructional materials, interactive computer software and modern equipment/technologies
(d) National Remedial Programme launched and operating in all high schools
(e) Pre-CXC/CSEC End-of-Year Examination for 11 subjects covering grades 7-10 institutionalized and operating in all high schools

8 DETAILED DESCRIPTION OF PROJECT COMPONENTS

The **project has five (5) main components** as follows:

- (i) Development of various types of digital instructional materials for both teachers and students
- (ii) Provision of modern equipment to:
 - Ministry of Education, Youth and Culture
 - Project Management Unit
 - 150 schools (including Internet access)
 - 100 public libraries
 - MOEYC Edu-TV (Interactive)
 - Support designation of 11 cable television channels for transmission of educational contents – one for each subject
- (iii) Training of teachers
- (iv) Remedial programme
- (v) Institute a standard end-of-year Pre-CXC/CSEC Examination for all high schools between grades 7-10 to scientifically monitor project success and school performance

Below is a detailed description of each component. The description of each project component represents the proposed plan for the project.

8.1.0 Development of Instructional Materials/Contents

The project will develop a comprehensive set of instructional materials for both teachers and students in **digital** format. This will facilitate flexibility in packaging, distribution and use. This is the most important and involved component of the project. Based on the field work of the Consultants, it was agreed that instructional materials for eleven (11) subjects should be developed instead of the ten (10) subjects originally proposed in the draft feasibility study. The subjects agreed between the schools and the MOEYC are as follows:

- (a) English Language
- (b) Mathematics
- (c) Social Studies
- (d) Integrated Science
- (e) Resource & Technology/Information Technology
- (f) Spanish
- (g) Geography
- (h) Building Technology
- (i) Chemistry
- (j) Biology
- (k) Physics

8.1.1 Nature of Materials to be developed

The project will draw on existing materials owned by Government and others and **re-purpose** them into a **standard and comprehensive** set of instructional materials spanning grades 7-11 in the eleven (11) subjects. Where necessary new materials will be developed to meet the standards required. The materials will cover in a comprehensive way the Reform of Secondary Education (ROSE) Curriculum and the CXC/CSEC syllabus and prepare students for the Pre-CXC/CSEC Exams during grades 7-10 and the Regional CXC/CSEC Exams at the end of grade 11. These materials will be used to develop lecture series. Various electronic forms will be prepared and packaged for distribution to schools and will inform the development/acquisition of a range of **interactive computer software** designed to improve the teaching of certain topics in each subject.

In the case of the materials for students, they will be complemented with respect to variety by the usual text books purchased by the MOEYC under the text book rental scheme. However, the materials will form the foundation for the syllabi and where there is a resource constraint on the part of the MOEYC to acquire text books, students should not be at a disadvantage in any way as the materials will be more than adequate to meet the needs of the curricula.

The materials will be developed using the best local expertise, buttressed by international experts, if necessary. The developers will comprise largely master teachers and other local “Centre of Excellence” educational professionals. Where local or overseas publishers already have instructional materials spanning say the equivalent of grades 7-11 and which can be adjusted or modified cost-effectively to meet the technical specifications required, they could be considered. However, it would be desirable for local expertise to be involved. Potential candidates such as publishers could be invited to display the existing resources possessed following which a pre-qualification exercise could be done and candidates invited to bid. If this approach is taken, the Government would have the copyright to the modified materials delivered under the contract.

It is envisaged that the materials will be re-purposed/developed through the involvement of the Joint Board of Teacher Education of the University of the West Indies or other competent entity such as CXC.

It is extremely critical that the materials not be of a remedial nature, so ensuring that teachers in the traditional high schools will be willing to use them widely. The materials will therefore be at a level that is consistent with expected regional standards for each grade, as it is expected that the materials will be made available to other countries within the Caribbean Region. Where necessary, **remedial** materials will be developed to meet special needs identified in the case of the newly upgraded high schools. This would complement specially designed remedial texts **already** developed for the **newly upgraded high schools** under an earlier remedial Secondary School Textbook Project funded by the Department for International Development (DFID) of the United Kingdom.

In-depth consideration will be given to the organization and structuring of the contents. The sequencing of topics will be based on wide consultations among teachers to arrive at sequences

that are generally accepted. This is important since the materials will form the base for video-taped lecture series that will be transmitted via cable television and also provided to each school to be used in the absence of teachers or for teachers to use to complement their teaching sessions. It is therefore important that there be general synchrony with respect to the sequencing of the topics in each subject, the lecture series and the teachers' lesson plans.

In the case of each subject at each grade, the master teachers will decide on a list of drawings, pictures, diagrams, charts and exhibits that will be ideally required. The Government will request local and foreign companies and individuals, teachers and students to provide complimentary exhibits. This will be an on-going exercise and available exhibits will be incorporated into instructional materials over time.

8.1.2 Existing Materials

The project will develop a comprehensive set of instructional materials for both teachers and students. In doing so, it will draw on all existing materials owned by the Government. The view is that significant amounts of **instructional materials already exist** and the need now is to draw on these materials and re-purpose them to meet the required needs. However, where the existing materials do not facilitate easy re-purposing and are not appropriate, the project will draw on what exists and do the necessary restructuring and develop new and appropriate materials.

Some instructional materials for students in Grades 7-11 have already been developed, while others are now being developed by various educational agencies in different subject areas. An important set of materials comprise those developed under the first phase of the ROSE Project (ROSE I) and any new materials developed under second phase (ROSE II) for Grades 7-9. These materials would include the MOEYC Foundation series.

Text books in several subjects of a **remedial nature** were developed under the Secondary School Text Book Project funded by the Overseas Development Agency of the British Government. These texts were developed specifically to meet the needs of the newly upgraded high schools and are now widely used in those schools.

There is also the "Expanded Secondary Programme." Under this programme, curriculum and instructional materials have been developed for students in Grades 10 and 11 for selected core subjects such as:

- English (including Literature)
- Mathematics
- Information Technology

For the past two years, the national training agency (HEART) and the Jamaica Movement for Adult Literacy (JAMAL) have been working together to develop a High School Equivalency Programme (HISEP) for Jamaica that will enable persons who did not complete their high school education the opportunity to do so. The core of the programme has five areas including Communication, Computation and Problem Solving, Society and Citizenship, Science and Technology and Interpreting Literature and the Arts. The five courses and associated

instructional materials are being prepared to satisfy the needs, interests, and certification requirements that are equivalent to those of the CXC.

8.1.3 Government to Own Intellectual Property Rights

The Government, through the MOEYC, will own the copyright to all materials. The project will therefore draw on existing materials for which the Government owns the intellectual property rights and re-purpose these to meet the required needs. As indicated earlier, where existing materials are inadequate, new ones will be developed. An important principle of the e-Learning Project is that it will **not** use materials which will require the Government to meet recurrent expenses based on number of copies reproduced. This is critical since an important objective of the project is to develop instructional materials for which the Government will have flexibility to reproduce and provide to schools without being constrained by intellectual property rights.

8.1.4 Materials for Teachers (Grades 7-11)

In the case of instructional materials for teachers, these will be configured so that they are **teacher-friendly** and therefore make teaching easy and convenient for the teacher. It is critical that the materials meet the felt needs of teachers so that they can be fully embraced. The materials will be designed to achieve instructional efficiency and effectiveness and enhance student learning. Below is a description of the materials that will be prepared for teachers.

(a) Detailed Teachers' Instructional Manuals (TIMs)

(i) Instructional Contents

A well thought-out and structured **detailed and comprehensive Teachers' Instruction Manual (TIM)** will be developed for each subject at each grade. The Teacher's Manual will constitute a **comprehensive set** of instructional contents/materials covering each topic in **detail** for each subject for each grade. It will include all the contents expected to be taught by the teacher. The manual will be developed on a topic-by-topic basis logically sequenced according to the curriculum. It is envisaged that the topics will be organized according to the number of weeks in each term and the contents expected to be covered each week by the average teacher in a **standard** high school. It is expected that schools that fall below the standard will put in the required remedial work in the evenings or otherwise to bring themselves up to the standard.

In principle the teacher's manual will be equivalent to the terms of reference in a consultancy service contract. It will therefore represent a clear understanding between the principal and a teacher in terms of what is expected to be taught by the teacher for a particular subject at a particular grade.

The manuals will be provided to schools in electronic/word processing format on CDs, DVDs and so on to facilitate modification by each teacher to meet his/her **personal** taste and preferences. It is envisaged that the school/teacher will print and package each manual in a three-ring type binder to enable the teacher to conveniently add supplementary materials.

(ii) Session Guides/Lesson Plans and Teaching Methodologies

Suggested session guides/lesson plans and teaching methodologies on a topic basis would be developed to assist teachers to improve their efficiency and effectiveness. Suggested teaching methodologies would be based on the experiences of master teachers guided by local and **international best practices**. It is envisaged that each principal would chair quality circle-type meetings comprising teachers in the subject to review the plans proposed by each teacher. During the meetings, the performance of each teacher's students in the Pre-CXC exams would be discussed; weaknesses identified and suggested improvements proposed. The teacher's lesson plan would be approved in these meetings prior to the start of the next school term.

(iii) Set of Activities/Assignments/Projects

A suggested set of student activities/assignments/projects on a topic basis would be developed for each subject, also drawing on national and international best practices. For each subject at a particular grade, there would be a suggested 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 the CXC/CSEC Examination.

The timely provision of this information to students will also ensure that teachers do not give students assignments at the last minute. It will also ensure that there is some level of planning, balance and orderly scheduling of assignments so that some teachers do not crowd out others and that due dates do not clash. The assignment schedule would also be discussed in the quality circle meetings and approved at that time. Where possible, assignments/projects will involve the use of simulation and interactive software to make the learning experience real to the students and deepen the level of internalization and applicability of the knowledge and skills learned.

It is believed that a suggested set of assignments will assist in ensuring that students pursue the highest quality of learning experiences through carefully selected practical work. It is also expected that this will help to shift the learning from a purely abstract theory to "learning by doing." This will apply especially to subjects such as the sciences, information technology, building technology, and so on. It is well established that learning by doing and discovering for oneself or "re-inventing the wheel" results in a deeper level of internalization and increases the permanency and applicability of learning. It is therefore important that the teachers employ international best practice activities, assignments and projects so that students can be exposed to the same kind of learning experiences as children in the developed countries.

(b) Educational Software

An important feature of the project is to improve the quality of teaching and learning using modern computer technology. Research shows that learning is more permanent where students use interactive/simulation software compared to simply reading about a topic in an abstract mode. Hence, the project is expected to draw on interactive computer technology to make

teaching and learning interesting, exciting and appealing, especially to boys who may be attracted to such technology. To meet this objective, computer software will be developed while some will be procured from “off the shelf.” The master teachers will identify the topics which teachers find difficult to teach and which students also find difficult to learn. This information will assist in guiding the type of software to be developed. The master teachers will prepare terms of references (TORs) which clearly set out the concepts and objectives to be achieved by the simulation software in the teaching of a topic.

While some software will be procured, this will be kept to an **absolute** minimum to enable the local industry to develop. A key strategy of the project is to facilitate the development of local software skills among information technology teachers. Hence, the emphasis of the project will be on the development of local interactive/simulation software and the building of a critical mass of local expertise in educational and other types of software. To achieve this objective, information technology teachers will be provided extensive training in computer programming and encouraged to develop educational interactive/simulation software. The Central Information Technology Office (CITO) will be responsible for organizing an annual exhibition of educational software developed by local IT teachers. The IT teachers from each high school will be invited to display products which they would like to make available free to all schools. Software will be organized in categories and prizes offered to the winning teachers in each category. While the teachers will exempt local schools from the intellectual property rights of their software, they will be encouraged where feasible to market them abroad. Software which teachers and other developers intend to sell would not be displayed at this exhibition. Those can be displayed at other commercially oriented exhibitions.

CITO will also organize meetings involving the teachers and the information technology officers in the ministries so that the teachers can get an opportunity to interface with practitioners and privately develop software for industry which could be marketed locally and abroad. It is hoped that in the long run teachers will be able to form alliances and take on software development projects for government and companies during their spare time to buttress their income. This could encourage experienced IT teachers to remain in the class room.

In addition to software developed by teachers, the MCST will request the local universities to have Jamaican students pursuing courses in computer science at the B. Sc. and M. Sc. levels develop interactive software as a part of their normal course work/projects for which they are graded. IT lecturers in the universities would be provided honoraria for giving their students technical guidance in the development of the interactive teaching software. The students will be able to display their software at the exhibition organized by CITO and compete also. Software developed by the students will be made available to the schools. Where a piece of software meets certain criteria with respect to its usefulness to schools, the student will be provided a financial reward. The central repository (discussed later) will take custody of software developed by the teachers and students and be responsible for distribution to schools.

It is expected that the first exhibition of teaching software will be held in August 2005. This exhibition will focus mainly on interactive/simulation software developed using Microsoft PowerPoint and free teaching software available on the Internet. It should be noted that only software that will be made freely available to schools will be displayed at this exhibition.

Software identified from this exhibition will be made available to the twenty (20) pilot schools in September 2005.

The Jamaica Computer Society, with its linkages to the local computer software developers' fraternity, is expected to assist with the training of the teachers to develop educational software.

(c) Laboratory Experiments

In the case of the four sciences (Integrated Science, Chemistry, Biology and Physics) at grades 7-11, the project will video tape a comprehensive series of laboratory experiments, package them on DVD and make them available to schools. Where appropriate, interactive computer software that simulates these experiments will be developed or purchased and made available to schools. These are expected to buttress and reinforce the practical work in schools. A student could do these simulations in a computer lab or at home before doing the actual experiments in the science lab.

(d) Development of Lecture Series

Master teachers will be used to deliver high quality presentation/lecture series for each subject at each grade. These lecture series will be based on the teachers' manuals mentioned earlier. The lectures will be sequenced in a logical manner so that they are in approximate harmony with the sequencing of the topics being taught in the schools.

The Creative Production and Training Centre (CPTC), other public sector entities and private companies will be contracted to video-tape the presentations and package them on DVDs and other electronic formats for distribution.

The lecture series developed by the master teachers will be made available to schools and public libraries and sold to the general public at cost. A teacher could use selected lectures or aspects of a lecture to enhance his/her presentation on a topic. More importantly, where a teacher is absent, the principal could have the students view the relevant topic. Also, where a teacher might be inexperienced, he/she could use the lectures as substitutes for certain topics since the lectures would have been developed by experts and therefore adequate for the teaching of a given topic.

Schools will be free to reproduce the lecture series and loan or sell at cost to parents for viewing by their children at home. Lecture series will also be transmitted via cable television. This is dealt with in more detail later.

Other supplementary lectures/presentations on particular topics could also be developed based on voluntary inputs of teachers. Teachers could be encouraged to compete for prizes in the presentation of supplementary lecture series. The Joint Board of Teacher Education could invite say five schools to compete in the presentation of a particular topic. A school would pay for the video taping of say a one hour lecture/presentation on a designated topic. The school would invite one of its subject teachers to prepare and do the presentation. This would be forwarded to the master teachers for viewing and rating or provided directly to the cable channel for transmission. In the latter case, the presentations could be rated by students through telephone

calls to the cable channel. Prizes could be awarded by the Joint Board of Teacher Education on the winning lecture for a particular topic. Teachers would therefore compete for prizes in the subjects they teach. This would serve to encourage the teachers to continuously improve their teaching methodologies in each topic for a particular subject and promote **national best practices**. By teachers being featured on the educational channels, this could contribute to their self-actualization.

The Joint Board of Teacher Education could maintain a list of award-winning teachers and put their names on the organization's web site. Since there are several topics in a subject for each grade, there could be several awards to be allocated and a teacher could get awards in more than one topic. Teachers would therefore compete to become members of that fraternity and schools would want to employ such teachers. Through this process of on-going competition among teachers, the quality of teaching could be improved. Over time, these award winning supplementary lectures could take over from the lecture series initially developed through the project.

The supplementary lectures would be used to buttress and complement the presentation of a master teacher on the particular topic. So for example a supplementary lecture could be entitled "demystifying Set Theory for Third Formers" by Mary Jane. Third formers who are not clear on set theory would view the supplementary lecture on cable television or borrow the lecture from the school library and view it at home to get another perspective.

(e) Multiple Choice Questions, Answers, etc. (In-School Test Bank)

It is well established that frequent and focused tests can result in improved performance of students compared to comprehensive exams taken at very long intervals. Hence, an **exhaustive** database of **multiple choice questions (MCQs)**, **answers** and brief **rationale/theory** (with reference where relevant) justifying each answer on a topic-by-topic basis for each subject at each grade would be built up over time. The Minister of Education, Youth and Culture would invite subject teachers across all high schools to prepare questions, provide the answers, and the theory "justifying" each answer. It is envisaged that each principal from the approximately 150 high schools would be given **a specific topic** in each subject for a particular grade. So questions on a particular topic for a subject would initially come from a particular school. The school would conduct the research on the topic, design the questions, and pre-test them in normal in-course tests/assessments prior to submission. The questions would be reviewed by a panel of master teachers, modified as necessary and the approved ones become a part of and an **In-school Test Bank** that facilitates **real time correction**. The teacher's name, school and year the question was submitted would follow the question in bracket in recognition of the teacher. For each subject at each grade, the questions and answers would be incorporated into test management software which would allow real time correction. This would facilitate self test by students on a particular topic. A teacher would also be able to administer an in-class test on a topic quickly and provide marks to students in a very short time thereby reducing the administrative burden on the teacher.

It is expected that schools/teachers will compete to have questions associated with their names in the database. It is envisaged that for each subject at each grade, an average of 2,000 MCQs would be developed. Approximately 20,000 questions will be developed for the 11 subjects.

A school would be expected to develop say 200 to 300 questions, answers and concise theory/justification for the answers **on the topic assigned**. Over time additional and improved questions can be added to the MCQ database. The objective is that these questions should **comprehensively** assess the competence of the students in the subject matter for that particular topic. All questions, answers and associated concise theory would be made available to students and not kept confidential as is now the case in some schools. Hence, no question should come as a surprise to the student who studies and prepares properly since he/she would have had the opportunity to see the possible questions that could be asked on the topic and the ways in such questions can be structured. The view is that by giving the students access to questions, answers and associated theory and knowing that an in-course test will be a sub-set of the database questions, the students will be encouraged to study the questions, answers and theory in their revision for a test. The concise theory associated with the correct answer for each question will also be an important source of instructional material for students, especially for revision purposes.

Where a teacher feels that the available questions in the database are too advanced for his/her class, he/she could set other MCQs to bring the students gradually up to the required standard. However, the teacher would be encouraged to make those school specific questions and answers available to the students via the school library. A teacher should only need to set additional questions where his/her students are significantly below the national standard and therefore cannot answer the questions in the In-School Test Bank for the particular grade. Also, this should only be so in the earlier grades.

In setting an in-course test on a topic, a teacher may do any of the following:

- select a random set of questions from the MCQ database
- select specific questions
- select specific questions and modify/re-arrange the responses/answers if there are concerns that students may simply memorize questions and answers

The MCQs, answers and theory would be put in an electronic database and provided to each school via CDs, DVDs or other electronic media for access by teachers and students on the school's intranet which is to be established under the project. The questions, answers and associated theory would also be printed and provided as an MCQ reference manual for the subject and placed in the school's library. The questions will be sorted in the manual so that the students can see the different ways questions can be structured to assess knowledge about a particular topic/concept.

This system means that a teacher would be able to prepare an **end-of-topic** test easily and mark the papers quickly since he/she will not need to develop questions and answers unless that is preferred. Little time would need to be spent clarifying answers following a test since the theory on which a question is based would be available and provided to the students so they would be

able to see where they went wrong. Also, a diligent student could review the MCQs, answers and read the concise theory following the teaching of the topic before doing the test.

At the end of each topic, a student would also be able to go on the school's intranet, do a test electronically or print a set of random questions from the database on the topic (equivalent to what the teacher would give), do a self-test, mark the paper, note the rationale for each answer and get clarifications as necessary. Parents could also organize for self-tests to be done at home say on weekends under supervision.

It is envisaged that with this system in place, teachers will be able to administer **continuous assessment** throughout the school year with little effort. It is also expected that teachers will place the marks on a **Continuous Assessment Tracking Chart (CAT Chart)** for each subject in the classroom to show how the class performs so that students who obtain poor marks can attend remedial classes at the school. The project will encourage schools to **embrace a culture of openness** and public display of in-course test results and end-of-year exam results in order to minimize the risk of **moral hazard** whereby students, parents, teachers and schools could keep poor performance confidential to avoid embarrassment. By concealing poor results no timely corrective/remedial action is taken by students, parents and school. Schools will decide if they disclose names or identification numbers.

It is envisaged that eventually, a parent should be able to view his/her child's in-course marks via the **school's website** or a centralized website and compare the child's marks with his/her peers in the class. The parent should also be able to view the marks of students in other schools and compare the performance of his/her child with students of other schools. Where performance is significantly below that of the peers, this will enable the parent to closely monitor the child's studying, assist the child with difficult topics or organize remedial interventions early. This information can assist in providing focused remedial support during the term and keep the public informed in terms of the performance of the schools. The best performing high schools will be encouraged to **take the lead in openness and public disclosure** of student performance in In-Course Tests.

(f) Extended Writing Questions

An **exhaustive** set of extended writing (EW) questions on each topic and model answers for typical questions would also be gradually developed over time and provided to the schools for placing on their intranets or in school library. Schools would be encouraged to share answers written by their top performing students for consideration as model answers. Like the MCQs, the student, teacher and school's name and the year would be associated with the answer in recognition of the parties. Teachers could also be asked to volunteer model answers for extended writing questions. Questions and model answers would be reviewed by the panel of master teachers for inclusion in the database. Again, this would be accessible to both teachers and students for in-course test administered by the teacher or self-test by the students.

8.1.5 Student' Instructional Manuals (SIMs)

Detailed and comprehensive Instructional materials mirroring the teachers' manuals will be prepared for the students and referred to here as Students' Instructional Manuals (SIMs). As stated earlier, some of these materials already exist. The teachers' manuals would be used as a base and modified/adapted for students. Materials will be prepared on a unit or modular basis for each grade in the subject. At the end of each module, there will be extensive practice exercises for students along with model answers where appropriate. The materials will be organized so that they are consistent with the ROSE curriculum and with a typical timetable for the subject in a high school. The materials will be structured based on a typical timetable such that the syllabus is covered on time and leave adequate time for study and exams.

The materials will be very comprehensive and more than adequate to cover the curriculum/syllabus for each grade. This is critical, as an important objective of the Project is for the materials to be a perfect substitute for texts now used in the textbook rental scheme, if the need arises. Hence, as indicated earlier, while the MOEYC would be expected to continue purchasing texts to supply the schools through the textbook rental system, where the Ministry is unable to do so in cases of budgetary constraint, the students should not suffer as the SIM would be more than a perfect substitute to textbooks. Schools and parents should see commercial texts books therefore as playing a supporting and complementary role in terms of enrichment, variety and providing a different perspective.

SIMs will be put on CDs, DVDs and provided to the schools for printing, copying and making available to students. Parents would be required to pay the reproduction cost. Where parents are unable to pay the reproduction cost, the students will be able to rent SIMs from the school at minimal cost.

8.1.6 Phasing in the Development of Instructional Materials

As indicated earlier, the following are the eleven (11) subjects for which instructional materials will be developed.

- (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

English Language, Mathematics, Social Studies, Spanish and Integrated Science are done by students under the same title from grades 7-11. Resource and Technology is done by students between grades 7-9. The equivalent subject in the Regional CXC/CSEC Examination is

Information Technology. So students will do Resource and Technology up to grade 9 and Information Technology between grades 10 and 11. Chemistry, Physics and Biology are done as components of Science between grades 7-9. Between grades 10 and 11 these subjects are done individually. Building Technology is a technical subject and is only done in certain schools. However, in the consultation forums conducted by FocalPoint Consulting Ltd. teachers expressed the strong desire that skills-based subject be included and Building Technology was chosen as one subject that should be done now. All eleven subjects are offered in the Regional CXC/CSEC Examination.

It should be noted also that the Government funds exam fees for the first four (4) subjects in the list, at the CXC/CSEC Level.

Instructional materials will be classified into Pre-CXC/CSEC Level comprising grades 7-9 and CXC/CSEC Level involving grades 10 and 11.

It is envisaged that a team of specialist master teachers will work on each subject and therefore all eleven subjects can be developed in parallel since the specialists are generally mutually exclusive. Each subject team is expected to be organized into five groups – one for each grade. So for example one group of master teachers would work on say grade 7 Mathematics while another would work on the grade 8 level. Materials will be developed over years one and two. Materials developed in year 1 will be tested and revised in year 2. Materials developed in year two will be tested and revised in year 3. Materials will be tested in the twenty (20) pilot schools and modified/adjusted based on feedback. Once materials are tested and revised they will be made available to all schools.

It should be noted that some subjects are not taught at grades 7 and 8 but are part of other subjects. This applies to Geography which is taught as a part of Social Studies between grades 7-9 while Chemistry, Biology and Physics fall under General Science between grades 7-9. Table 8.1 shows a preliminary development schedule. This schedule will be revised and agreed by a Technical Advisory Committee (TAC) at the commencement of implementation.

Table 8.1: Proposed Phasing of Development of Instructional Materials

Subject	2005/06	2006/07	2007/08
(i) English	Grades 7-9	Grades 10-11	Revision
(ii) Mathematics	Grades 7-9	Grades 10-11	Revision
(iii) Social Studies	Grades 7-9	Grades 10-11	Revision
(iv) Integrated Science	Grades 7-9	Grades 10-11	Revision
(v) R&T/IT	Grades 7-9	Grades 10-11	Revision
(vi) Spanish	Grades 7-9	Grades 10-11	Revision
(vii) Geography	Grades 10-11	Revision	Full “roll out”
(viii) Building Technology	Grades 10-11	Revision	Full “roll out”
(ix) Chemistry	Grades 10-11	Revision	Full “roll out”
(x) Biology	Grades 10-11	Revision	Full “roll out”
(xi) Physics	Grades 10-11	Revision	Full “roll out”

8.1.7 Process in Development of Instructional Materials

(a) Teachers' Instructional Manuals (TIMs)

Below is a preliminary process envisaged in the development of the instructional materials assuming master teachers are used. This is done mainly to estimate project cost. It is expected that a Instructional Materials Sub-Committee (IMC) of the Board (discussed later) will decide on the exact approach to be employed. The IMC would develop and agree on detailed technical specifications of the materials in terms of the objectives to be achieved, contents, sub-division of topics, layout, organization, diagrams, drawings, pictures and other exhibits and so on. Master teachers would be invited to form themselves into subject teams for bidding. A team may include local and overseas subject experts who do not necessarily have to be teachers. However, local personnel must play the lead role in the team to ensure development of local expertise.

A team would be required to develop the materials for each subject for the five grades to ensure coherence and avoid un-necessary overlapping and duplication of contents. Each team would be broken down to a grade level. A work group comprising of say two specialists would develop the materials for a particular grade. It is envisaged that it will take between 6-9 months to complete the teachers' instructional materials and 3-6 months for students' instructional materials for a subject at a particular grade.

A competent entity would be contracted to perform the role as project manager and quality control (PMQC) specialists. The contracting will be done on a competitive basis to ensure transparency, efficiency and economy. It is envisaged that an entity such as the Joint Board of Teacher Education (JTBE) of the University of the West Indies could perform this role. However, the Regional Caribbean Examination Council could also be a likely competent candidate.

The PMQC entity would invite teams for pre-qualification. It is expected that at least three equivalently competent teams will be pre-qualified to bid for a particular subject. Teams that already have relevant contents would have an advantage. Where a PMQC entity already has appropriate materials, consideration will be given to its eligibility to bid if potential conflict of interest can be removed.

It is envisaged that the PMQC entity would comprise a full time project manager, a secretary, and two consulting subject specialists for each subject. The subject specialists should ideally be hired on lump sum contract basis according to the delivery of the final product. One subject specialist would deal with materials from grades 7-9 while the other would deal with grades 10 and 11. The project manager would have responsibility for overall coordination of the eleven teams as they develop the materials. The subject specialists would provide technical guidance and oversight to the teams to ensure that the work progresses according to technical specifications, and sign-off on the final product, and submit to the client.

(b) Students' Instructional Manuals (SIMs)

Once the base materials are developed for the teachers, the master teachers will use these and modify them and develop the materials for the students. This is expected to be a less demanding exercise compared with the development of materials for the teachers.

(c) Input of Teachers from Pilot Schools

The input of the teachers from the pilot schools will be integral in the development of the instructional materials. It is important that the views of the teachers be taken into consideration since they are the **ultimate client**. The developers will therefore convene a series of workshops to solicit the input of the teachers. It is assumed that for each subject, two pre-development workshops would be conducted – one for grades 7-9 and one for grades 10 and 11. A senior subject teacher from each pilot school would participate in a workshop for the grades 7-9 and one for grades 10 and 11. At these pre-development workshops for the instructional materials, teachers could be invited to share contents with developers and decide on technical specifications of the TIMs and SIMs for each subject at each grade. So for example at a pre-development workshop for say Mathematics for grades 7, the following types of information could be agreed:

- Curriculum
- Objectives to be achieved by topic
- Sequencing of topics
- Table of contents
- Sub-division of contents into **units** for each **week** of each **term**
- Types of exhibits expected -diagrams, pictures, drawings, tables, etc.
- General layout of manuals
- Layout/arrangements/organization of session guides
- Organisation of assignments/exercises/projects, etc.
- Font type, font size, colours, numbering format, etc.
- Approximate number of pages, etc.

The developers would prepare draft of the above and circulate to teachers prior to the workshop. These could also be sent to other schools outside of the pilot inviting comments via e-mail. At the workshop, comments would be provided and decisions taken on fundamental issues.

Following the development of the draft TIMs and SIMs, these would be sent to teachers electronically for review and comments. Comments would be provided to the developers electronically for consideration. Following the incorporation of the comments, the developers would convene post development training workshops to clarify issues and get sign-off from teachers. (See 8.2 “Training of Teachers” for further details.)

8.1.8 Central Repository for Educational Materials

The project will establish a Central Repository for Educational Materials (CREM) to take custody of all instructional materials developed or acquired under the project. Eventually the CREM will be located within the MOEYC. The MOEYC will hold all copyright to materials

developed. It is critical that the CREM ensure that no other organization holds the intellectual property rights. This is important since a critical objective of the project is to develop materials for which the Government will have the intellectual property rights so that the Government can reproduce the materials freely and make them available to both the in-schools and out of school population as a part of its effort to create an educated and knowledge-base society. The CREM will be responsible for all reproduction and distribution to schools, continuous updating of materials and so on. The CREM may choose to charge a small margin above reproduction cost to enable it to have resources to pay consultants to continuously update the materials.

In arranging for the on-going updating of the materials, the CREM may use staff within the MOEYC or outsource this service. It is envisaged that entity such as JBTE or CXC could play an important role in the on-going update of the materials.

The CREM was originally planned to be located in the Media Services Unit of the MOEYC. However, the Task Force on Education recommended in its report certain organizational restructuring within the MOEYC. At the time of writing the MOEYC has not decided on the division which could perform the role of the CREM and related functions. Hence, the PMU for the e-Learning Project will have responsibility for the CREM until the MOEYC is in a position to take over the function. It is expected that this would at the end of the project when the functions of the project are to be institutionalized.

Initially, the CREM will start off simple and may be just the educational specialist in the PMU who will receive, store, back-up and account for materials developed. This includes documentation on intellectual property rights. Materials developed could be packaged on CDs, DVDs and so on and provided to schools. Eventually the CREM could have broadband Internet connectivity to all high schools for the transmission of updated contents. It should be noted that this will not be a frequently needed service. It is important that the CREM start of simple and as experience is developed over time improvements are introduced. Caution should be exercised in not making the CERM technologically complex initially to avoid costly IT infrastructure and personnel to support it.

8.2 Training of Teachers

(a) Types of Training

Teachers will be trained/oriented in three areas as follows:

- instructional materials
- Use of new software and technologies/equipment
- Setting and marking Pre-CXC/CSEC Examinations

Below are the relevant assumptions in order to estimate project cost.

(b) Training of Teachers in Instructional Materials

The developers of the instructional materials will be responsible for conducting the training/orientation of the teachers in the pilot schools. As indicated earlier, the developers would be required to meet with the teachers to get their comments on the contents, structure and

organization of the materials. The post-development training/orientation will be in two phases. An initial training will be done prior to the use of the instructional materials. That training is designed to orient the teachers to the materials and provide clarifications and obtain feedback from the teachers. Based on the feedback, the materials would be revised by the developers and the revised versions provided to the teachers to commence use at the start of the September school term.

The second training is designed to get further feedback from the teachers following the use of the materials. Based on the feedback, the developers will further adjust the materials as appropriate. Following this final adjustment, the materials will then be provided to other schools outside of the pilot for use.

It is proposed that this training be conducted in the teachers colleges if convenient. Where that is not practical, other cost-effective venues will be explored.

It is assumed that on average forty-four (44) teachers would be trained in each school. This assumes the eleven (11) subjects with four (4) teachers per subject at each school. For each subject, two (2) teachers would be trained from the Grades 7-9 level and two from the Grades 10 and 11. However, not all schools currently do all eleven subjects at CXC and so the number of teachers to be trained in each school could vary.

It is assumed that a **three-day workshop** would be conducted for each subject for **grades 7-9** with one day dedicated to each grade. A workshop would accommodate between 20-25 teachers with an average of 22 teachers. Based on the above assumptions, below are the estimated number of training days, number of teachers/trainees and number of trainee days for the pilot schools.

- (i) Number of Training days (workshops) = No. of subjects x days/subject x
No. of workshops/subject
= 11 x 3 x 2
= 66
- (ii) Number of teachers/trainees = No. of schools x No. teachers per
subject x No. of Subjects
= 20 x 2 x 11
= 440
- (iii) Number of trainee days = Training days x avg. trainee per
workshop
= 66 x 22
= 1,452

In the case of the **CXC grades** (10 and 11), a **four-day workshop** would be conducted for each subject. For each grade, one day would be dedicated to instructional materials for teachers and day for students. A workshop would accommodate between 20-25 teachers with an average of 22 teachers. Based on these assumptions, below are the estimated number of training days, number of teachers/trainees and number of trainee days for the pilot schools.

- (i) Number of Training days (workshops) = No. of subjects x days/subject x
No. of workshops/subject
= 11 x 4 x 2
= 88
- (ii) Number of teachers/trainees = No. of schools x No. teachers per
subject x No. of Subjects
= 20 x 2 x 11
= 440
- (iii) Number of trainee days = Training days x avg. trainee per
workshop
= 88 x 22
= 1,936

It should be noted that the purpose of the training/workshop is not to teach content but instead to familiarize the teachers with the content, clarify issues and obtain feedback.

(c) Training in Use of Equipment

A two-day workshop will be conducted for the grades 7-9 teachers in each subject.

- (i) Number of Training days (workshops) = No. of subjects x days/subject x
No. of workshops/subject
= 11 x 2 x 2
= 44
- (ii) Number of teachers/trainees = No. of schools x No. teachers per
subject x No. of Subjects
= 20 x 2 x 11
= 440
- (iii) Number of trainee days = Training days x avg. trainee per
workshop
= 44 x 22
= 968

A two-day workshop would also be conducted for grades 10 and 11 teachers in each subject.

- (i) Number of Training days (workshops) = No. of subjects x days/subject x
No. of workshops/subject
= 11 x 2 x 2
= 44
- (ii) Number of teachers/trainees = No. of schools x No. teachers per
subject x No. of Subjects
= 20 x 2 x 11
= 440
- (iii) Number of trainee days = Training days x avg. trainee per
workshop
= 44 x 22
= 968

(d) Training in Setting and Marking Pre-CXC/CSEC Examinations

A one-day workshop would be conducted for teachers in grades 7-9 and a one day workshop for grades 10 and 11. The workshops, which will be conducted under the auspices of CXC, will train teachers in the setting and marking of Pre-CXC/CSEC Examinations. At the workshops, the teachers will agree on the logistics of the setting of examination papers, printing of papers and marking of scripts.

With an average of 22 teachers per workshop, and 880 teachers, a total of 40 workshops would be conducted. Twenty workshops would be for the grades 7-9 and 20 for the 10 and 11. At grade 11, students would be expected to sit the CXC/CSEC Examination.

(e) Training of Teachers Outside of the Pilot Schools

The training/orientation of other teachers from schools outside the pilot group will be conducted through the usual in-service training programmes operated by the teachers colleges. However, more importantly training will be through Edu-TV and the specialist cable channels. The training sessions conducted for pilot schools will be video taped and presented via the respective cable channels.

Each workshop will be video taped and provided to schools along with other orientation documentation. Also, a special lecture series will be prepared which provides teachers with a comprehensive orientation to the materials. This will be placed on CDs, DVDs and other media for transmission via Edu-TV and cable channels.

8.3 Equipment Needs of Project

(a) IT Infrastructure for MOEYC

The project will provide support to the MOEYC to improve its IT infrastructure. This will involve the implementation of an Educational Management Information System (EMIS). The MOEYC completed two detailed studies which considered the Ministry's needs in depth. The recommendations could not be implemented due to lack of funds. Cabinet has allocated J\$50 million for the commencement of the e-Learning Project. This amount is designated to commence work on the MOEYC's IT infrastructure. The MOEYC is now in the process of reviewing existing studies so that it can revise the cost of its EMIS and prioritize its needs so that implementation can commence. (See Appendix 1 – Table 13. 12 for provisional sum for the MOEYC IT Infrastructure.)

(b) Central Repository for Educational Materials (CREM)

It should be noted that based on further research, it has been concluded that the original concept of the CREM was far too elaborate and complicated. A far less complex system will suffice. During the life of the project, the Project Management Unit will host the CREM. At a later date when the MOEYC has built the receiving capacity, the CREM will be transferred to the

MOEYC. For the time being the CREM will form a part of the PMU IT infrastructure. The cost of the PMU IT infrastructure will be dealt with later.

(c) Technology Learning Centres

The project aims to establish on average two technology learning centres (TLC) in each high school depending on resource availability. A TLC will comprise a computer lab appropriately equipped to use information and communications technology (ICT) to enhance the teaching of **all subjects** in the school and not just computer science/information technology. The tendency is for computer labs to be associated only with the teaching of computer science/information technology but a shift in this thinking will be advocated. The computer lab must be seen as supportive of teaching and learning of other subjects in the school with emphasis on the eleven (11) subjects being pursued under the project. This shift in thinking is critical so that the interactive materials can be supportive of training in other subject areas. However, the information technology/computer science teacher would have oversight responsibility for the TLC.

Technology learning centres will be established in the pilot schools first to equip them to test the new instructional materials. In the first year, one lab/TLC will be installed in each of the pilot schools. In the second year, the second TLC will be installed with other non-pilot schools getting priority. It is most important that TLCs be established in those schools that already have even a small core of teachers trained in the use of computers. The project will avoid installing computers in schools where members of staff are not trained. Experiences of other countries suggest that where the staff members are not adequately trained before, the equipment tends to be grossly underutilized and is likely to become obsolete by the time the teachers are trained and develop a fair level of competence. Hence, the installation of equipment for TLCs outside of the pilot schools will be demand-led rather than supply-led with priority given to **newly upgraded high schools** which are in a position to adequately utilize the machines.

It is envisaged that each TLC will comprise 25 computers with two students sharing a computer. One of the computers will act as a server. It is assumed that the average class size is 50 students. An additional five computers will serve as spares and for use by the administration as is deemed appropriate. Each TLC will need to be air conditioned and special computer desks acquired. The room may also need some level of refurbishing.

It should be noted that FocalPoint Consulting found in their research that schools would like some flexibility in how they deploy the equipment for maximum benefits. Some schools may want to place some computers in their libraries. Each school will therefore be given the opportunity to advise on its TLC. At the commencement of the project, the IT Specialist from the Project Management Unit will assess the specific needs and preferences of each of the pilot schools. The IT specialists, the MCST's Technology Division and the Central Information Technology Office (CITO) will decide on the exact technical specifications of the equipment. Table 9.2 shows a listing of the proposed equipment for a typical TLC.

Table 8.2: Equipment for Typical Technology Learning Centre at a School

Categories of Cost	Unit	Quantity
Accommodation (grilling, air conditioning unit, etc.) for TLC		
Network server	each	1
Desktop computer	each	30
Laptop computer	each	5
UPS	each	8
Scanner	each	1
Laser printer	each	1
Multi-media projector	each	5
Wireless hub	each	1
Furniture (desks, chairs, etc.)	each	
Accessories		

(d) Computer Maintenance and Replacement

A novel approach will be used for maintaining the computer systems in a cost-effective manner and simultaneously enhance the learning of students. This system is based on a Canadian model which has been quite successful. A team of competent IT specialists will be employed or contracted to train the approximately 600 IT teachers in the 150 schools starting with the 20 pilot schools. In addition to the training, the IT specialists will provide on-going technical advice and support to the schools. The IT teachers will be provided extensive training in computer assembly, maintenance and trouble shooting. They will in turn be required to teach the students how to assemble computers, install software and repair the computers so that the training can have a practical dimension and not abstract.

Companies and individuals will be asked to donate computers which have been retired, be they functional or non-functional. These computers will be used for training the students in computer assembly and maintenance. The teachers will give the students projects/assignments which will require them to work in teams under supervision to dismantle the retired computers, re-assemble them, re-install software and get the computers working again. Two students in each grade will be assigned to a new computer at TLC. It will be the responsibility of all the students who have been assigned to a computer to ensure that it works at all times. This will ensure that the students treat the computers with care, become responsible and learn to trouble shoot and solve problems. The teachers will play a consulting role to the students where a computer is malfunctioning. In cases where the teachers are unable to solve a problem, the teachers/students will consult the IT specialist assigned to the school. The students/teachers in charge of a malfunctioning computer will send report to the IT specialist via e-mail and receive trouble shooting instructions. Where the students are unable to fix the computer, the IT specialist will do so.

Each school would be encouraged to also employ a low-cost computer technician who could be one of the school's best graduates in IT who is unemployed. The graduate, who could have been

identified earlier and groomed, would be regarded as undergoing work-experience and receive a stipend from the school. He/she would be located in the computer lab permanently and function as a technician to assist the teacher of a particular subject who is using the lab. The technician would ensure the safety and proper use of the equipment by students according to pre-determined operating standards and procedures. He/she would be skilled in the relevant software used by the students in the various subjects. The IT specialist, as a part of his contract under the project, would be required to provide extensive training to the graduate/technician and use him/her as an on-site technician in the lab. This will ensure that there will be limited call on the IT specialist at the school. Training of the technicians is a priority and will commence once the TLCs are established in the pilot schools. Training will take place at one of the pilot schools.

The school would also be encouraged to invite teachers to conduct evening classes using the lab(s) for the “out of school” population. The IT technician would assist with these classes. Income from this source could be used to pay the technician, the teacher and residual goes to the school to meet utilities expenses and computer replacement.

To ensure sustainability of the system, schools will be encouraged to require that all the students across the grades assigned to a particular computer pay say US\$5 per term each as a part of their school technology fee. This fee would go into a School Technology Fund (STF) which the school would use to purchase replacement parts for the computers, fund the eventual replacement of the computers and other technology needs of the school. It is estimated that between 20-30 students across all the grades depending on the size of the school would be assigned to a particular computer. This could yield between US\$100 – 300 per annum. Schools will also be encouraged to have a Technology Fund-Raising Drive each year where students would undertake fund-raising initiatives to buttress the technology fee paid. The parent teacher association (PTA), relevant non-governmental organizations (NGOs) and companies in the vicinity of the school are expected to support the school in this annual fund raising drive.

(e) Multimedia Projectors, Screens and other Accessories

The project will provide each school with five (5) heavy-duty multimedia projectors, screens and accessories. Teachers will be trained in the use of the equipment and encouraged to present more of their classes using multimedia to improve the interest of students in the subject matter. Selected classrooms will be fitted with large white boards/multimedia screens to accommodate multimedia projection of the lecture series developed by the master teachers.

Classrooms equipped for multimedia will also be wired for access to the Internet. A teacher will therefore be able to access the Internet while teaching in a classroom and display the information on screen/white board. He/she would also make extensive use the of **interactive computer software** developed/acquired under the project to make learning interesting and exciting to the students. The presentations of these **interactive software** will be via the multimedia projectors.

(f) Security of Equipment

School equipment are very prone to theft and appropriate strategies are necessary to mitigate against this risk. Each TLC will be properly grinded. In addition, each piece of equipment in a TLC will be sprayed internally and externally with a non-partisan colour paint. This will be high publicized and technicians which repair computers will be asked to ensure that computers or parts sprayed with such colour and presented to them for repair are not stolen goods.

(g) Support for Edu-TV

As a part of the IT infrastructure of the MOEYC, the project would provide assistance with equipment for the Ministry to establish an educational cable television channel known as “Edu-TV.” If practical, Edu-TV will operate as an **interactive channel** whereby students can get immediate feed-back and clarifications to commonly asked questions. Subject specialists would be on standby in the case of certain programmes to answer questions and clarify issues. Scheduled time would be designated on Edu-TV for the pilot testing of the lecture series presented by the master teachers. It is envisaged that Edu-TV will play an important role in teacher training/orientation with respect to the new materials. The project would finance the costs associated with transmission aimed at orienting teachers to the new materials.

The Edu-TV programming would therefore serve as an instrument for the development, demystifying and promotion of subject content. Some programmes would facilitate teachers calling in to get clarification on relevant subject areas, teaching methodologies, etc. High achieving students would appear on the channel to share their experiences and insights as a means of sharing best practices in study habits, etc. Examiners would appear and provide feedback on areas of weaknesses, discuss commonly misinterpreted questions and so on.

The related content aired on Edu-TV would serve a critical role of providing cost-effective, sustainable in-service training to the teachers in the new paper-based and interactive materials. Some of the in-service training programmes conducted by the teachers colleges would also be packaged on relevant media and transmitted via Edu-TV. This would avoid the need for bringing teachers into the teachers’ colleges for certain types of in-service training. Teacher training in particular subject areas would also be delivered via Edu-TV in order to reach a wide audience of teachers and to facilitate continuous in-service training and upgrading. The exact cost of establishing Edu-TV is to be determined. A provisional sum has been allocated. (See detailed project cost at Appendix 1 – Table 13.12.)

(h) Specialist Cable Television Channels

The MCST, with support from the Broadcasting Commission, will work with the cable operators to develop a block of educational cable television channels for the transmission of the lecture series developed by the master teachers. The plan is for the cable operators to designate two channels which will be compressed and re-configured to yield twelve (12) digital channels which will be dedicated exclusively for educational purposes. The project will provide the core equipment for the compression and re-configuration of the channels. Cable operators will be encouraged to interconnect to increase transmission coverage throughout their network. The

new regulations pertaining to cable television now being promulgated will give special consideration to the block of educational channels. Technical assistance is needed in working with the cable operators to determine the technical specifications and costs involved. Based on preliminary discussions with the cable operators, a provisional sum has been allocated in the project budget. (See Appendix 1 – Table 13.12) It is envisaged that the International Telecommunication Union which has expertise in this area will provide technical assistance to the MCST in the implementation of this component of the project.

Each cable TV channel will be dedicated to the transmission of instructional materials on a **particular subject**. In packaging channels for their customers, cable operators would ensure that these channels form the core of their package in their support of the Government's thrust to create an educated and knowledge-based society. The block of channels will be highly promoted so that every household that has access to cable television service will want to ensure that their cable providers include the block channels as a part of the standard service.

As indicated earlier, master teachers will be used to deliver high quality comprehensive lecture series in each of the eleven subjects. Each channel will operate as a **low-cost non-interactive** channel that specializes in a particular subject. Note that it is envisaged that Edu-TV will operate as an **interactive channel**. The transmission for each subject ranging from grades 7 – 11 would be pre-programmed and consistent with the school curriculum and sequence of topics throughout the school year. Transmission of a particular topic/session would be repeated over several days to enable persons who miss a presentation to be able to see it at another time or facilitate repeat viewing for reinforcement. Hence a student who does a topic at school and who may not have grasped the contents well could view the same topic on cable channel presented by a master teacher. Alternatively, as a part of the “pre-reading” preparation for a topic at school, a parent could encourage his/her child to read the student instructional material on the topic, watch the corresponding presentation on cable television prior to the lecture/presentation at school. The teacher could then spend most of his/her time clarifying issues and answering questions.

Where possible, free or inexpensive instructional materials on each subject will be sourced internationally and provided to the cable operators for transmission on the designated channels. It is envisaged that the ITU will assist in sourcing instructional contents internationally from English speaking countries to transmit on cable channels and provided to schools for viewing on multimedia projectors in the specially equipped classrooms.

Each channel would therefore serve as an instrument for the **development, demystifying and PROMOTION OF THE SUBJECT**. Like Edu-TV, a subject channel could have subject experts at different levels (Grade 7 – 11) appearing and giving insights, advice on particular aspects of the subject. These could be pre-recorded and transmitted repeatedly. Top students would appear on the channel to relate their experiences and offer insights as a means of sharing best practices in study habits and exam techniques. Examiners would also appear and provide feedback on areas of weaknesses, discuss commonly misinterpreted questions and so on pertaining to that particular subject.

Most importantly, the subject channels would serve the **“out of school”** population who may experience difficulty attending evening classes. Those students could therefore benefit from the

presentations by expert teachers. In effect the channels will enable high school instructional contents to be delivered in the homes.

It is envisaged that content relating to grades 1-6, and 12 and 13 could be included at a later date. Teacher training in the particular subject would also be delivered over the subject channels to reach a wide audience of teachers and facilitate continuous in-service training and upgrading.

The MCST, in collaboration with the Broadcasting Commission, will invite companies to bid competitively to sponsor each of the twelve cable channels for a specific time of say a year or two years. Telecommunications companies such as Cable and Wireless and Digicel, along with some of the major commercial banks and bauxite companies are expected to play an important role in the sponsoring of the channels. A channel would transmit instructional materials for the designated subject and would be allowed to promote the sponsoring company's products only. In return the sponsoring company would meet all operating costs associated with operation of the channel. In its promotion programme, it is envisaged that a company would associate itself with the **promotion of the particular subject**. The company would also be requested to assist in funding the development of the lecture series for the particular subject that would be transmitted via the channel. In the bidding exercise, a company will be asked to provide a proposal as to how it will support the channel. The company with the best proposal will be awarded the sponsoring rights for a particular channel. If required, two or more small companies could jointly sponsor a channel.

In the absence of computers in many homes and therefore the lack of access to the Internet, subject channels via cable could be an **inexpensive technology** for distribution instructional materials to tens of thousands of students.

It is hoped that the ITU will provide technical assistance in working out the technical details for the operation of each channel, estimated operating cost and actual implementation of this component.

(i) Project Management Unit

The main items of a capital expenditure nature, including equipment for the Project Management Unit (PMU), are presented in Table 8.3.

Table 8.3: Capital Requirement for Establishment of Company Office/Project Management Unit

Categories of Cost	Unit	Quantity
Office refurbishment (Provisional sum)		
Office furniture:		
- Desks	each	10
- Tables	each	4
- Chairs	each	30
- Filing cabinets	each	5
Computer systems:		
- Server for CREM	each	1
- Desktop computers	each	9
- Laptop computers	each	4
- Laser printers	each	2
- Accessories	Lump sum	
- Computer software	Lump sum	
Fax machines	each	2
Multimedia projector	each	2
Photocopy machine	each	1
Miscellaneous		

See Appendix 1 – Table 13.10 for the estimated cost of equipment for the PMU.

8.4 Remedial Programme

(a) Programme Concept

Following policy interventions which led to a significant increase in the access of students to high schools, there are now several students ending up in the newly upgraded high schools that are significantly below the grade 7 level. Many of these students cannot read properly and this is a major hurdle for them to perform well in the other subjects. It is also a major source of frustration for the teachers in the newly upgraded high schools. To have any significant improvement in the quality of education, **a major island-wide remedial programme** that is well institutionalized is necessary. However, in light of prevailing resource constraint, this will have to be through creative voluntary service. Jamaica has enough well educated persons who would be happy to provide a national service in support of Government’s higher developmental goal. In light of general budgetary constraint to mount any substantial remedial programme, the project is advocating an extensive system that is based on **voluntarism**.

There are several national and international interventions more of an experimental and pilot nature which have been tried. In the majority of cases, they have demonstrated success. However, they have not been able to institute a sustainable system to deal effectively with the magnitude of the problem. Hence, the project is proposing a component with a sustainable dimension. This intervention is intended purely to complement existing and other programmes now under active planning by the MOEYC.

The Project would initiate a major remedial programme to correct for weaknesses of certain students in **reading** and **other subject areas** as identified by the Pre-CXC/CSEC **Continuous Assessment System** and the **In-Course Assessment Tests** administered by teachers during the year. All project schools will be required to institute a remedial programme for students in grade 7 and other grades where necessary.

The programme will draw on the support of retired teachers, retired civil servants, other volunteers, and students. A school will be required to make classrooms available for the conduct of remedial classes in the evenings, weekends and holidays. Students who performed poorly in the in-course tests and Pre-CXC/CSEC Exams will be required to attend remedial classes from early. Remedial classes will be termed **“tutorials”** to remove any negative connotation. In the lower grades, tutorials will focus primarily on Reading, English and Mathematics. **Interactive computer software** through the technology learning centres will be utilised as much as possible in supporting the tutorials. Where appropriate, students will also be assisted with their homework during tutorials also.

(b) Student Tutors

Students constitute an enormous resource that can be utilized to assist weaker peers. With the right **school culture and administrative system**, strong students can help weaker ones. Research has shown that a student can explain certain concepts to another student better than some inexperienced teachers. A student will draw on his/her own experience in understanding the concept and use simple language that another student can easily understand to explain the concept. Also, by trying to teach and explain concepts to another student, the student also benefits, as he or she is able to internalize the knowledge at a higher level.

High performing students from Grades 7 to 11 in project schools who attain certain averages in particular subjects would be requested to provide two (2) hours **“community service”** per week assisting with tutorials as a part of their extra-curricula activities obligations. In the case of sixth form students, all should be required to provide at least one (1) hour voluntary tutorial service per week. These students would be designated “Assistants” or “Student Tutors.” During tutorials, a student tutor will act as a resource person to clarify issues and concepts, revise basic concepts taught and not understood by peers, and assist weaker students on a one-to-one basis. Weaker students who learn certain concepts will be encouraged to teach those concepts to others. This builds self-esteem and confidence. A student tutor may provide this service either at his/her school, at another school, at a homework centre or otherwise. However, it would be preferable for this to be done at his/her school in the evenings, week-ends and on holidays for monitoring of programme by school.

Hours contributed by students doing tutorial work will be reflected in the transcripts of those students. It will be an honour for a student to attain student tutor status in a particular subject. A school could also find creative and inexpensive ways of recognizing its student tutors.

(c) Adult Volunteer Tutors

The Governor General will be approached and asked to act as patron for a “National Remedial Programme in Schools” and will have a cadre of volunteers that could be termed the GG’s Educational Volunteer Corps (GG-EVC). This cadre of volunteers will work with schools and the student tutors to assist with remedial classes. The Governor General will issue a general invitation to members of PTA’s, members of the church community, incumbent and retired civil servants, retired private sector professionals, current employees of companies, and the service clubs, to become members of this prestigious corps. This is intended to entice and mobilize **highly educated persons** in the society and channel their energies and resourcefulness into the classroom. It will also serve to get these persons to make education a prime agenda item and mobilize resources for the schools.

Each school would therefore build up a pool of Volunteer Tutors from which it will draw to support its remedial programme. These tutors could be given special recognition at the school such as **naming a classroom** after a tutor while that tutor is providing tutorial service. At the end of each academic year or at graduation, the school could provide recognition to volunteer tutors. Persons who serve as tutors for a minimum of say five (5) years or a certain number of contact hours could be eligible for an official award from the Governor General.

Tutorial class sizes will be small, ideally accommodating no more than ten (10) students. Each session will preferably be under the supervision of a volunteer adult tutor, and supported by one or two student tutors. At the start of each class, the adult tutor could spend approximately five (5) minutes giving a motivational speech. He/she could also spend that time briefly discussing issues such as the importance of **good values and attitudes** and the importance of education in the new global environment. A structured programme could be developed and provided to tutors. This is important to get the students motivated and internalize the importance of taking advantage of the educational opportunity being afforded them.

(d) Tutorials conducted by Retired and Existing Teachers

Effort should be made to encourage retired teachers to assist with remedial programmes. Schools could also consider paying honoraria to teachers for conducting remedial classes for the weakest students, providing the students in a remedial class are not taught by the teacher during regular classes. The Parent Teachers Association (PTA) and companies in the vicinity of a given school will be encouraged to contribute to a **Remedial Fund** in each school. The remedial fund will be managed by the principal and used to provide honoraria to retired and existing teachers for remedial classes. Tutorials conducted by volunteers mentioned earlier would be free. Also, note that paid remedial classes would be for the weakest students.

Students who performed poorly in Pre-CXC/CSEC Exams and need remedial classes will be assessed by their guidance counselors to determine whether or not their parents/guardians can

afford to pay for remedial sessions. Those who can afford will be asked to pay while those unable to will **receive scholarships from the Fund** to pay the teachers. Depending on resource availability, in the case of the newly upgraded high schools, the Project will make a contribution of \$1M to each newly upgraded high school in the pilot schools to establish a Remedial Fund and get the programme started. This could be extended to other newly high schools.

(e) Administrative Support

The school will provide administrative support in terms of timetabling, development of rosters, monitoring and reporting system, security of classrooms and general school property, while facilities are being used for remedial classes. It is envisaged that subject teachers will be responsible for organizing logistics and ensuring that the remedial programme for the particular subject system operates efficiently and effectively.

(f) Monitoring of Performance

All students who receive project scholarships will be required to sit a standard test in the relevant subject areas to assess the performance of the remedial programme. Those students who attend the student tutorials may not be required to do this test since they would be more advanced.

8.5 Continuous Assessment System (CAS)

(a) Rationale and Justification

As indicated earlier, the mandate of the Minister of Education, Youth and Culture is that the project should focus on improving the **quality** of education in the high schools. Ultimately, improvement in the quality of education is best measured by performance in the Regional CXC/CSEC Examination. In light of the absence of any reputable standard end-of-year examination at each grade, it is imperative that the project institute such a system to track performance throughout grades 7-10. It is through a credible measurement system that project success and school performance can be objectively assessed to ascertain if the quality of education is improving and to justify further resource allocation.

It is the wish and aspiration of every responsible parent for his/her child to attain appropriate levels of passes in the recognized **Regional CXC/CSEC Examination**. Hence, the project uses the Regional CXC/CSEC Exam at grade 11 as the **National Standard**. To track students' performance and to enable students to be properly prepared for the CXC/CSEC Exam at grade 11, the project will institute a **Pre-CXC/CSEC Examination** to measure the performance at each grade prior to the CXC/CSEC Exam at grade 11. The exam will comprise the eleven (11) subjects and span grades 7-10. Through the Pre-CXC/CSEC Exam, problems in performance will be identified in the early grades so that **timely corrective action** can be taken. If Jamaica is to create an educated and knowledge based society, it is critical that poor performance in the early grades at high school be identified and highlighted so that the society and critical stakeholders such as teachers, students and parents can be stimulated into action to address any problem. Where performance is poor, public pressure will challenge the key stakeholders to

find creative ways to improve performance. Most importantly, by keeping poor performance in the spotlight, it provides the justification and rationale for the government to leverage much needed resources to address concerns in the education sector.

The Pre-CXC/CSEC Exam will form a standard **Continuous Assessment System (CAS)** for students between grades 7-10 and will be a key instrument for continuously measuring and monitoring school performance. The Pre-CXC/CSEC Exam will be an **end-of-year** exam for each grade in the eleven subjects. It will start off as a purely **VOLUNTARY examination** and schools will be free to decide if they want their students to sit the exam or not. However, it is envisaged that because of its **standard, credibility** and **national profile**, the exam will shortly become the **Standard National End-of-year Exam at each grade** and all high schools will end up doing the exam. Just as how the society takes a keen interest in the CXC Exam results, the Pre-CXC/CSEC Exam results will command widespread national attention. It will provide detailed information to the society on the performance of all high schools using a **common reputable “yard stick.”** It will overcome any potential moral hazards where schools set their own exam to match the standard of the students and continue operating at that level without being challenged to find solutions. Considering that the society will be taking a keen interest in the performance of students in each high school in the Pre-CXC/CSEC Exam, it is envisaged that teachers, students and parents will put out a greater level of effort during the school year to improve performance.

It should be noted that the **Pre-CXC/CSEC Exam would not be an additional examination.** It will simply be a replacement of end-of-year exams now set by individual school. So, instead of each school **setting its own end-of-year exam**, it would employ the national Pre-CXC/CSEC end-of-year examination. Also, the exam would not be replacing any mandatory national exam currently in operation in the high schools. Hence at grade 9, those schools which would like their students to sit the usual ROSE Exam and the Grade 9 Achievement Test would continue to do so. Those traditional high schools, which do not enter students for the Grade 9 ROSE Exam, and which would prefer for their students to sit the higher level Pre-CXC/CSEC Exam would be able to exercise that choice. Accordingly, some schools would do the Pre-CXC/CSEC Exam from grades 7-10 while others would do it at grades, 7, 8 and 10.

The exam results will serve to monitor the performance of the Project as outlined in the Logical Framework. Where the Pre-CXC/CSEC Exams identify or reveal a low level of performance in schools, interventions will be explored to assist teachers, students and parents taking corrective action at an early stage when the situation might still be correctable. Schools may want to implement remedial classes to strengthen weak students during the evenings, on week-ends or conduct remedial summer classes to lift the students to meet the national standard. For their part, parents may wish to arrange for extra lessons for their children early if they realize that performance is below the national standard. It would allow **special affirmative action programmes** to be designed for children coming from homes with limited academic support. Special evening and week-end classes can be organized for these students to bring them up to national standard. Creative funding can be explored to support these remedial programmes.

The Pre CXC/CSEC Exam along with continuous in-course tests administered by the teachers will therefore act as an **early warning signals** so that teachers, students, and parents will be able

to take **timely** remedial action prior to the CXC/CSEC Exams at grade 11. The philosophy here is that students in high schools can perform better if poor performance is identified **early** and proper a remedial programme is implemented by stakeholders.

(b) Accountability by Key Stakeholders

The education sector currently receives the largest percentage of the national budget outside of debt service. The sector therefore should provide **transparent accountability** to the society for the resources provided. Also, if greater levels of resources are to be provided to the education sector in light of prevailing budgetary constraint, then the society must know if the increased resources are resulting in any incremental improvement in performance.

The results of students' performance in the Regional CXC/CSEC Examination are in the public domain. The public can therefore gain access to the performance of students by school. The results of the Pre-CXC/CSEC Examination will also be provided to the public. This will be one form in which the high school system will be providing accountability to the tax payers for resources provided. Hence, the Pre-CXC/CSEC Exam results could be made public via the school's website. By making its examination results public, the teachers, students and parents will be providing transparent accountability to the tax payers for the resources provided and justification for increased resource allocation. Three key stakeholders can influence examination performance. These are the teacher, student and parent/guardian and all three should be required to account to the public/society with respect to academic performance. Hence, it is proposed that three pieces of information be provided to the public as follows:

- name of teacher of the class/subject where the teacher has no objection
- Name of student (who have no objection) and corresponding marks by subject
- Name of parent(s)/guardian who have no objection

Parents/guardians will be asked to provide letters of non-objection to the school to have their names associated with the examination results of their children/ward and for the names of their children and their marks to be made public. This will be done at the time of registration when the child enters the high school at grade 7. It is felt that this will sensitize parents to the responsibility they have to the education of their children and the role they are required to play if their children are to perform well. It is expected that this will result in a certain amount of public ostracism and public pressure on irresponsible fathers who take no interest in the education of their children but leave the burden on mothers and on the society.

The project will provide an annual monitoring report to the Hon. Minister of Education, Youth and Culture on the performance of the high schools in the Pre-CXC/CSEC and CXC/CSEC Examination. The report will also include information on say the ten (10) lowest performing high schools with explanations for the poor performance and recommendations on measures that should be taken where possible to improve the performance of those schools. It is expected that an affirmative action could be taken in the case of those schools with respect to resource allocation to bring up their level of performance.

The oversight and governance responsibility of each school is delegated by the Minister of Education to the school board. The board is responsible for hiring teachers and will be requested

to provide accountability reports in terms of detailed examination results to the parent body and the community at large. Where the performance of a school is below the expectation of the parent body and the community, the school board could be asked to provide explanation for the poor performance and their plans to improve the situation.

Each school could be asked to provide a performance report to the Member of Parliament and caretaker of the Opposition party for information purposes. Each Member of Parliament could be encouraged to table in Parliament an Accountability Report on the performance of each high school in his or her constituency in the Pre-CXC/CSEC and CXC/CSEC Examinations. This will require a Member of Parliament and the Opposition caretaker to display greater interest in educational affairs in his/her constituency. All Members of Parliament will share a common interest of having more resources dedicated to education. Each Member of Parliament would also be interested in leveraging more resources for the schools in his/her constituency.

(c) Levels for Pre-CXC/CSEC Exams

It is recognized that all high schools are not at the same level. Generally, the newly upgraded high schools receive students at a lower academic level. Hence, it is necessary to have a transition phase for say students at grade 7 and 8 whereby there are two levels of the Pre-CXC/CSEC Exams. For these two grades, there would be a Level 1 and a Level 2 Exam similar to the Basic Proficiency and General Proficiency in the CXC/CSEC Exam. Level 1 Exam will be a lower standard while Level 2 would be the standard exam and consistent with the standard expected of that grade for countries in the Region that use the CXC/CSEC Exam as their national exam. **It is imperative that the Level 2 exam is not below, nor perceived to be below the standard which prevails in the top high schools.** Some schools have expressed this concern as they do not want the Pre-CXC/CSEC Exam to be lower in standard than their existing end-of-year exam.

However, each high school would have the choice to decide on the level for which the school would wish to enter its students. A school could therefore have the option to enter all its students for Level 1, Level 2 or some for Level 1 and some for Level 2.

(d) Operational Details

The Regional CXC body will provide technical assistance to the schools in setting the Pre-CXC/CSEC Examination papers in each of the eleven subjects for the five grades. Discussions have already been initiated with representatives of CXC. The representatives are very supportive of the plan and have expressed the view that the plan is an excellent initiative and that they are looking forward to its implementation.

(i) Pilot Pre-CXC/CSEC Examination

It is hoped that a pilot Pre-CXC/CSEC Examination can be conducted in June 2005. The twenty (20) pilot schools will be invited to agree on the structure and format of a common end-of-year exam for selected subjects and for specified grades. Subject teachers will meet, contribute and agree on questions for Level 1 and Level 2 exam papers for the agreed subjects and grades.

Having agreed on the structure of the examination papers, marking schemes, and so on, the schools would proceed to reproduce the papers and administer them in their June 2005 end-of-year exam. The schools will take special precaution to ensure the security of the exam papers. For the subjects and grades agreed, the schools will agree on a common examination timetable so that all the schools will do the examination for a particular subject at the same time.

In the event that the time is too short selected schools will be asked to collaborate in the setting papers as to the extent feasible.

Schools would organize themselves in pairs for the marking of the exam papers. A pair of schools would agree to exchange papers and mark them. So if for example, school "A" and school "B" form a pair, school "A" would mark a fixed number of scripts for school "B" while school "B" would mark the same number of scripts for school "A." This would apply to a particular subject and particular grade. Where one school has more students than the other, the one with the larger number of students could exchange scripts with a third school. An alternative approach is for the schools to distribute the scripts among themselves such that a school does not mark the scripts of its own students and that it marks scripts totaling the number of students it enters for the exam.

Following the completion of the marking exercise, a workshop would be convened whereby the results of the exam would be shared among the schools. Problems encountered would be discussed, lessons learnt noted and recommendations made for improvement in the June 2006 exam.

(ii) Implementation of Pre-CXC/CSEC Examination

CXC would be requested to provide technical assistance in the implementation of the Pre-CXC/CSEC Examination. The CXC technical advisors would provide training for the teachers of the pilot schools in the setting of examination papers, developing marking schemes, and in the standardization on marking of examination scripts.

It is proposed that each school be invited to provide questions, marking schemes and answers to CXC for each subject at each grade and at Level 1 and Level 2. CXC would draw on those questions and on its own resources and prepare final exam question papers, marking schemes and model answers. Each school will decide on the number of students that it wishes to enter for each examination, the level, grade and subject. CXC will arrange for the secure reproduction of the question papers. Each principal would be responsible for the collection of the exam papers from the CXC office, ensure safety of the papers and oversee the administration of the exams. To minimize moral hazards, schools may choose to exchange teachers for invigilation and administration of exams.

CXC will charge each school a cost recovery fee for each question paper supplied. The fee would be set so that it would enable CXC to cover cost incurred in setting the papers, preparing marking schemes and model answers, reproducing the question papers, doing random marking of a sample of scripts and meeting incremental overhead expenses associated with the exercise. A school will pay CXC for the number of question papers required. In effect, a school would be

buying exam question papers from CXC. Either the school will meet this expense on its own or require students to pay an exam fee to meet the incremental expense. It should be noted that normally the schools would reproduce their own end-of-year examination papers. Therefore the incremental cost of the exam to the school would be the difference in cost between what CXC charges for the question papers and the cost to the school for reproducing its own exam papers.

A preliminary estimate suggests that the cost to the school for one question paper should range between US\$0.50 to US\$1.00. The cost will vary depending on number of pages per question paper and the incremental overheads expenses of CXC in administering the programme. It is expected that CXC will make every effort to keep expenses to a minimum.

Once the examinations have been administered, schools would organize for central marking of scripts initially to ensure that marking standards are clearly understood. A group of subject teachers from say two to three schools would agree to meet as convenient to them at agreed locations. The teachers would organize themselves in marking teams as is now done by CXC and based on training provided by CXC. It should be noted that teachers will not be paid for the marking of scripts since a teacher would be doing nothing different from when the examination papers were set by the school. Also a teacher would not be required to mark more scripts than the number of students he/she entered for the examination. However, a school may choose to provide a subsistence allowance to its teachers from the proposed exam fee to meet traveling expenses, etc.

It is not expected that CXC would be involved in the marking of the exam scripts. This is purely to reduce cost. However, CXC will be asked to review a random sample of scripts and assess if teachers have marked the papers according to the standards established in the training. Based on that review, CXC would provide a report on their findings and express an opinion as to whether or not the teachers have been too generous in their allocation of marks, too rigorous or generally satisfactory. This report would be made public.

CXC will not take responsibility for the security of question papers once they have been provided to the principals. Also, the organization will not take responsibility for quality control for exam marking and results. That will be the responsibility of the schools. The schools will therefore be responsible for the marking of scripts, tabulation of marks and preparation of relevant reports.

(iii) Main Features of New System

The main features of the new system are as follows:

- Schools will not set their own end-of-year examination questions. Question papers will be set by CXC.
- Schools will provide suggested questions to CXC which will prepare the final question paper in each subject at each grade for Level 1 and Level 2.
- Schools will “buy” question papers from CXC at a price that will enable CXC to cover cost associated with the exercise.

- Schools are expected to charge students a nominal exam fee per subject to cover the cost for the provision of question papers and provide a subsistence allowance to teachers to meet travel and related expenses associated with marking of exam papers.
- The Pre-CXC/CSEC Examination questions, marking schemes and model answers will be made public once an examination is administered. Also questions, answers and marking schemes provided by the school to CXC will be made public early to assist students in their preparation for the Examinations.
- A school will not mark its own examination scripts. Scripts will be marked by teachers from other schools through an exchange process.
- Scripts will be marked by teachers using the marking schemes and model answers supplied by CXC.
- CXC will train teachers in the marking of scripts but will not be involved in the marking of scripts in order to reduce cost.
- CXC will not be held responsible for quality control associated with the administration of examination, marking of papers and tabulation of exam results. That will be the responsibility of the schools. CXC's primary responsibility will be to prepare question papers and provide them to the schools.

(e) Recognition for Incremental Improvements in Quality of Education

Under the project, the GSAT results for students entering a school will be used as a benchmark in estimating the **value-added** by the school. It will also be used as a measure of the incremental improvement in the quality of education. Any improvement will be measured against this benchmark to determine the incremental improvement of the student. So for example, if a student obtains **65%** average in the GSAT Examination and an overall average of **68%** at grade 7 in the Pre-CXC/CSEC Exam, that student would have achieved an incremental improvement of **3 percentage points**. An overall GSAT average can be arrived at for each class and for the entire school. Therefore a comparison of the GSAT benchmark average and the Pre-CXC/CSEC marks at each grade can be made at the student level, the class level and the overall school level. Incremental improvement at the class level can be a reflection of the performance of the teacher.

The absolute marks received by a student in the Pre-CXC/CSEC Exam are not so important in the measurement of performance. It is the **incremental percentage improvement (IPI)** that will be given more focus since this reflects the value-added of the teacher and the school. So for example, a student in a newly upgraded high school with a benchmark average in GSAT of 65% and who receives an overall average in grade 8 of 70% (5% incremental improvement) in Pre-CXC/CSEC would have achieved greater improvement than a student in a traditional high school with a 90% average in the GSAT and an overall average of 92% in the Pre-CXC/CESEC Examination.

It is hoped that the results of the Pre-CXC/CSEC Exams will generate keen interest and attract national attention so that it can be used to prod the school system to greater levels of performance. For example, the Minister of Education, Youth Culture can set incremental performance targets for each subject for the high schools in the next Pre-CXC/CSEC Exam. A school board can set targets for each subject and an overall target for the school. The principal can set targets for each class and for each teacher. Teachers in turn can set targets in

consultation with each student. These targets would be made public to enable the public to monitor performance.

The Minister, the school boards and companies can provide awards to schools, teachers and students who have achieved outstanding IPI. Incremental percentage improvement would also be an objective basis for implementing a system of **performance – incentives** for teachers. So for example one unit of incentive could be provided for an IPI of 1%. The implication of this is that the newly upgraded high schools would have greater potential for a teacher to receive higher performance incentive since the GSAT average would be low and there is greater opportunity for incremental improvement. It is easier for a teacher in a newly upgraded high school to achieve an incremental percentage improvement for a class of say 5% than for a teacher in a traditional high school where the GSAT average is higher. This could create some balance between teachers in the newly upgraded high schools and the traditional high schools in terms of the ability of a school to attract good value-added teachers.

9 ORGANIZATION AND MANAGEMENT

9.1 Limited Liability Company

The MCST will establish a limited liability company as a portfolio agency which will have the implementation of the project as its primary mandate initially. This will be a fully owned public company. Shares in the company will be held by the Permanent Secretary in the MCST and the Accountant General. Approval has been received for the company to be named “e-Learning Jamaica Ltd.” or “e-LJam” for short. e-Learning Jamaica Ltd will be established as a subsidiary of the Universal Service Fund (USF) for the telecommunications sector. However, even though being a subsidiary of the USF, policy decisions in terms of projects to be funded and approval of funds for e-Learning Jamaica Ltd. will be determined by the MCST and Cabinet and not by the USF.

9.2 Draft Mission Statement of Company

The Mission of e-Learning Jamaica Ltd. is to employ information and communications technology (ICT) in the continuous improvement and modernization of education to create an educated and knowledge-based society.

9.3 Role and Function of e-Learning Jamaica Ltd

The primary role and functions of e-Learning Jamaica Ltd. will be as follows:

- (a) Act as the project implementation arm of the Universal Service Fund of the telecommunications sector.
- (b) Implement the various components of the e-Learning Project;
- (c) Introduce on a continuous basis, creative and innovative technology-related interventions, projects and programmes to improve the quality of education in schools;
- (d) Identify sources of funds for the implementation of the e-Learning and other projects; and
- (e) Act as the institution that links technology and education.

As the company will be non-income earning, it is expected that it will be funded mainly from the Universal Service Fund of the telecommunications sector.

9.4 Board of Company

The Board will comprise nine (9) directors and will have initial representations as follows:

- (a) Chairman – distinguished national figure
- (b) Vice Chairman – Representative of the MCST
- (c) Permanent Secretary, MOEYC
- (d) Two Senior Representatives, MOEYC
- (e) Principal of a high school
- (f) Representative from telecommunications sector
- (g) 2 other representatives

The Board will have the usual oversight responsibility for the company and perform the expected functions of a board for a public sector body. The priority focus of the Board initially will be to oversee the implementation of the e-Learning Project. With respect to the project, the Board will have authority and responsibilities as follows:

- (a) high level monitoring and oversight of implementation of the project and provide relevant reports to the portfolio Minister, Minister of Education, Youth and Culture and other stakeholders;
- (b) establish sub-committees which will include non-board members with the relevant technical expertise to ensure successful implementation of the project
- (c) provide transparent accountability for resources provided for project implementation;
- (d) ensure that transparent procurement processes are followed consistent with Government Procurement Guidelines;
- (e) approve project budget subject to the MCST's concurrence and Cabinet's endorsement;
- (f) vary project components as deemed necessary to achieve project objectives;
- (g) vary component budget as necessary;
- (h) approve contract packages and oversee the procurement process;
- (i) authorize all project expenditure;
- (j) make key decisions regarding project implementation; and
- (k) perform other functions as deemed appropriate

9.5 Sub-Committees of the Board

The following are some of the sub-committees of the Board expected to be established:

- (a) Administrative sub-committees
 - (i) Audit Sub-Committee (Chairman to be a non-board member, possibly from one of the telecommunications companies)
 - (ii) Finance and Administration Sub-Committee
- (b) Technical Sub-Committees – At least one sub-committee for each project component
 - (i) Instructional Materials Sub-Committee (IMC)
 - (ii) Technologies and Equipment Sub-Committee (TEC)
 - (iii) Teacher Training Sub-Committee (TTC)
 - (iv) Remedial Programme Sub-Committee (RPC)
 - (v) Pre-CXC Sub-Committee

The Permanent Secretary in the Ministry of Education, Youth and Culture will recommend to the Board key persons from the MOEYC and portfolio agencies to the various sub-committees. It is expected that members of the sub-committees will come from the following stakeholder agencies:

- (i) Senior Directors of relevant divisions of the Ministry of Education, Youth & Culture (Divisions would include Planning, Curriculum Development, Professional Development, Assessment, Media Services, Project Management and Technical Services)

- (ii) Ministry of Commerce, Science and Technology and relevant portfolio agency
- (iii) Funding agencies/Development Partners
- (iv) Representatives of telecommunications companies
- (v) Central Information Technology Office (CITO)
- (vi) Representative of the Teachers' Colleges
- (vii) HEART
- (viii) JAMAL
- (ix) Other relevant agencies of the Ministry of Education, Youth and Culture
- (x) Jamaica Teachers Association
- (xi) Jamaica Computer Society and Software Developers Association
- (xii) Other stakeholders as appropriate

No potential contractor or potential supplier of goods and services will be a member of the sub-committees. This is to avoid any potential conflict of interest.

Each sub-committee would co-opt other technical experts as needed from time to time.

The functions of the sub-committees will be as follows:

- (i) Provide technical advise for the implementation of the various project components
- (ii) Take decisions of a largely technical nature
- (iii) Make recommendations to the Board of e-Learning Jamaica Ltd. regarding matters of a major financial nature
- (iv) Propose contract packaging for approval by the Board
- (v) Conduct evaluation of tenders and make recommendations to the Board
- (vi) Rigorously monitor performance of contractors and service providers
- (vii) Other functions as determined by the Board

9.6 Staffing of e-Learning Jamaica Ltd

The proposed staffing compliment of e-Learning Jamaica Ltd is presented below.

Table 9.1: Proposed Staffing Compliment of Company

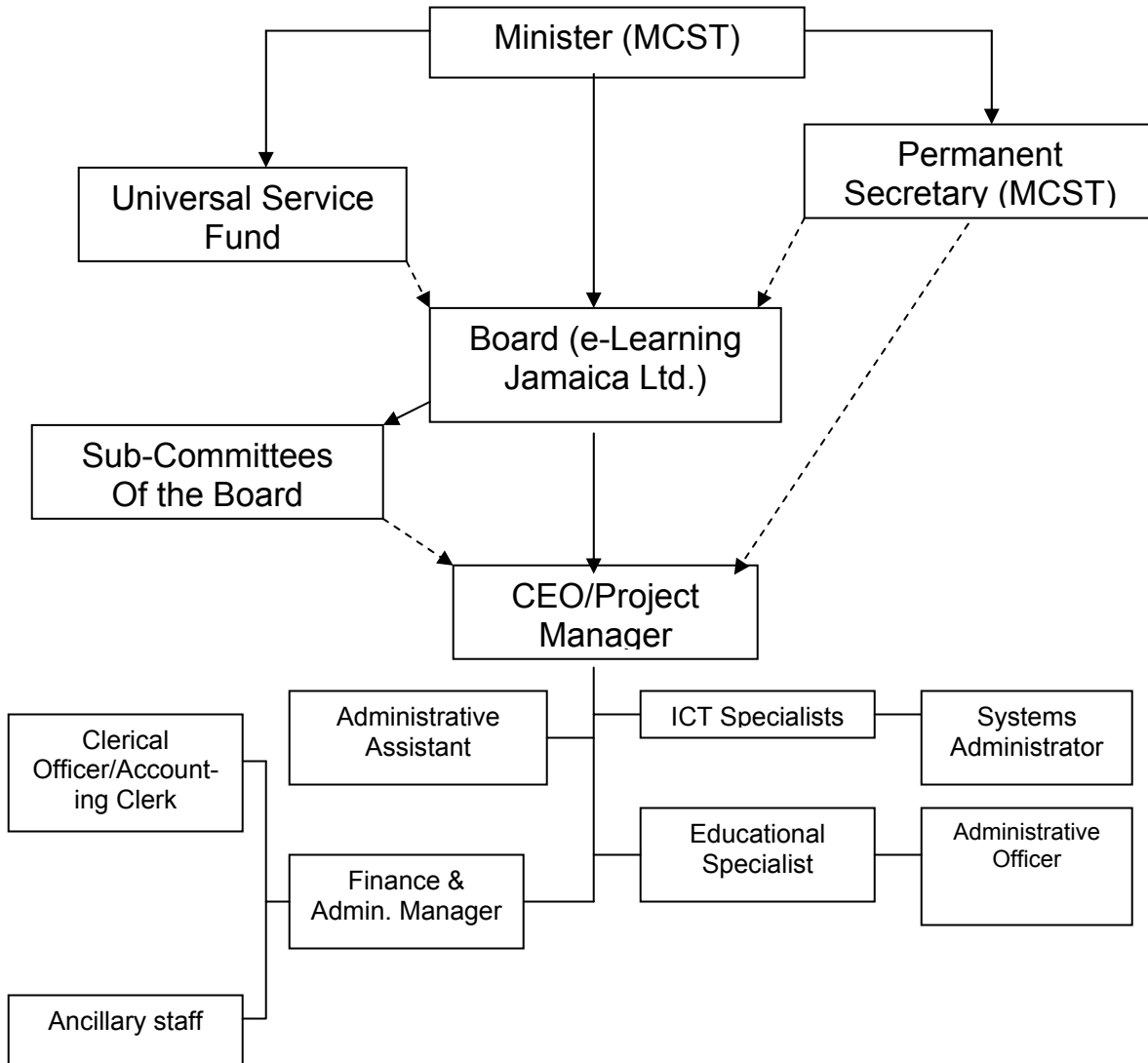
Positions	Number of Positions
Chief Executive Officer/Project Manager	1
Administrative Assistant	1
Senior ICT Specialist	1
Junior ICT Specialist	1
Educational Specialist	1
Finance & Admin. Manager	1
Administrative Officer	1
Systems Administrator	1
Clerical officer/Accounting Clerk	1
Ancillary staff	1

Since the primary focus of the company for the first three years will be on the implementation of the e-Learning Project, for convenience the company will be referred to as the **Project Management Unit or PMU for short.**

9.7 Organizational Structure and Reporting Relationship

The proposed organizational structure is presented below.

Figure 9.1: Organizational Structure for e-Learning Ja. Ltd.



9.8 Job Descriptions for Key Positions

Below are the key duties and responsibilities of the four senior positions of the Company.

(a) Chief Executive Officer/Project Manager – Key Duties and Responsibilities

- Responsible for overall project implementation and management of company/MPU
- Coordinate preparation of detailed project implementation plan
- Coordinate preparation of operations manual
- Review and finalize procurement packages
- Assist technical officers in preparation of terms of references and tender documents for procurement of goods and services
- Monitor project implementation
- Provide general oversight of the project and report to the board and other stakeholders on project implementation
- (Other functions to be added)

(b) Finance & Admin. Manager – Key Duties and Responsibilities

- Responsible for overall financial matters of the project and the company's affairs
- Prepare financial and procurement policies and procedures for board approval
- Prepare plan showing financial, accounting and human resources record system for board approval
- Institute accounting and financial and human resources record system
- Prepare organizational and project budgets for approval
- Prepare monthly financial report for board/project steering committee meeting
- Manage the procurement needs of the organization
- Oversee the financial and human resources affairs of the organization and provide reports to various stakeholders as needed
- Interface with the auditors and provide information as needed
- (Other details to be added)

(c) Senior ICT Specialist – Key Duties and Responsibilities

- Responsible for overall ICT matters of the project and company
- Inspect IT infrastructure in schools and prepare proposed equipment list for each school
- Prepare procurement packages for equipment needs of project
- Oversee procurement of equipment and installation in schools
- Monitor contracts with IT specialists for installation and maintenance of equipment in schools
- Prepare contract packages for procurement of software for approval
- Prepare tender documents and oversee the procurement process

- Monitor contractors engaged to install Internet access in schools
- Design and establish Central Repository for Educational Materials (CREM)
- Collaborate with CITO and information technology officers

(d) Educational Specialist – Key Duties and Responsibilities

- Prepare draft terms of reference for development of instructional materials, receive comments from stakeholders and finalize
- Prepare draft contract packages for development of instructional materials for approval by TAC and Board
- Manage the procurement process for consultancy services for development of instructional materials
- Prepare draft terms of reference for development of instructional materials, receive comments from stakeholders and finalize
- Prepare draft contract packages for development of instructional materials for approval by TAC and Board
- Manage the procurement process for consultancy services for development of instructional materials

9.9 Technical Assistance

It is hoped that the ITU will be able to provide support with respect to funding of the PMU and in particular certain key positions.

10 PROJECT COST AND FEASIBILITY

10.1 Project Cost

Appendix 1 presents the detailed project cost for the three years. It should be noted that during the three year period, the project budget and the company budget are expected to be the same since implementation of the project will be the main focus of the company for the first three years of operation. Table 10.1 shows the summary project cost over the three year implementation life.

Table 10.1: Summary of Project Cost (US\$)

Categories of Project Cost	2005/06	2006/07	2007/08	Total
1. Development of Instructional and other Digital Materials	2,127,100	4,570,600	5,631,300	12,329,000
2. Training of Teachers	706,667	2,120,000	2,473,333	5,300,000
3. Equipment and IT Infrastructure	3,160,000	1,021,000	10,720,000	24,090,000
4. Remedial programme	300,000	900,000	1,050,000	2,250,000
5. Institute Standard End-of-Year Exam (Pre-CXC/CSEC Exam)	200,000	600,000	1,050,000	2,250,000
6. Project Management	610,000	550,000	550,000	1,710,000
7. Inflation plus Physical Contingencies (Reproduction and distribution of materials to schools, etc.) – 5%	355,188	947,530	1,056,232	2,358,950
TOTAL	7,458,955	19,898,130	22,180,856	49,537,950

(Note that Appendix 1 containing the detailed project cost is not available to the public.)

10.2 Rationale for Proposed Project Financing Arrangement

The Task Force on Education (mentioned earlier) which was commissioned by the Hon. Prime Minister reported that the Government will need to invest an additional US\$240 million (J\$15 billion) per annum over the next ten (10) years to improve the education sector. This is a major challenge for the Government in light of limited budgetary resources and the prevailing debt burden. The Government has indicated that the focus on education is of highest priority and a central part of its strategy of creating an educated and internationally competitive economy to cope with the challenges of globalization and in particular the impending CSME and FTAA which could potentially marginalize the economy. Against this background, the Minister of Commerce, Science and Technology is strongly in support of using ICT and resources available through the sector to support the education sector.

The MCST considers that the country has now achieved universal access in voice telephony. However, access to data and the use of ICT and the Internet for development purposes is lagging far behind. The MCST has concluded that without a significant increase in the educational level of the country, increased use of the Internet and the use of ICT for business and development purposes are not likely to see any significant increase. While there is high demand for voice telephony among largely uneducated persons, this segment of the population does not place high priority in gaining access to the Internet. It is felt that the children (in schools) constitute the greatest opportunity for sensitizing the population to the Internet and to create an educated and knowledge-based society.

Within this context, it is the policy objective of the MCST to strategically leverage resources (provided under the telecommunications Act 2000 for universal access within the telecommunications sector) to fund this project and thereby support the Ministry of Education, Youth and Culture in its effort to improve the quality of education at the high school level. The MCST believes that this approach will be the most appropriate use of available resources to accelerate the creation of an educated and knowledge-based society.

The Telecommunication Act 2000 provides for a maximum of 5% of sales to be provided for universal service obligations (USO). In terms of policy priority, the MCST wishes the resources from the USO to be dedicated to the introduction of ICT-related interventions aimed at improving the quality of education in the high schools. The MCST is firmly of the view that by improving the IT infrastructure and use in schools, this will have a positive impact on access to data and the creation of an educated and knowledge-based society.

The USA has a similar policy and there are legislation in place for using resources from its USO to fund computers, software and related interventions in the school system. This has been quite successful. However, while the Jamaican Telecommunications Act 2000 does provide for universal service fund, it does not have the flexibility as the USA legislation. This is a matter that will be addressed when the Telecommunications Act is revised.

In the interim, the MCST has been holding discussions with the telecommunications companies and service providers whereby universal service obligations of the companies would be met if the companies agree to contribute between 2-3% of sales to the e-Learning Project estimated to cost approximately US\$50 million over the next three years or between US\$15-17 million per annum. After the three years the normal interpretation of the Act would apply. However, by then the new Act would be in place which would allow the Government to use the resources from the universal service fund to achieve its policy objectives based on its national priorities. The resources from the USO would account for approximately 7% of the US\$240 million required per annum to be injected into the education sector.

As indicated earlier, the MCST signed a Memorandum of Understanding (MOU) with the International Telecommunication Union in November 2003 whereby it is envisaged that the ITU will provide resources to assist in the funding of the project. Funding will also be explored through other development partners.

10.3 Technical and Institutional Feasibility

The project has no major technical challenge and is considered to be technically feasible. A potential challenge is one of an institutional and administrative feasibility. The project is essentially an educational project and ideally the issues addressed should be dealt with by the Ministry of Education, Youth and Culture through its normal programmes. However, in light of general budgetary constraint of the Government, that is not possible at this time.

The Minister of Commerce, Science and Technology is very keen on using available resources within his portfolio to support education in light of Government's priority focus on the sector. The Minister of Education, Youth and Culture and the Minister of Commerce, Science and Technology both endorse the principle of "joined-up government" and commit to working collaboratively in support of education without the MCST appearing to be "overlapping or trespassing" on the education portfolio. To avoid any perception of "trespass," the provision is for the Permanent Secretary in the Ministry of Education, Youth and Culture and two senior IT Specialists to be on the board of the company that will be implementing the project. The Permanent Secretary will also be chairman of the Technical Advisory Committee comprising mainly of representatives from the MOEYC. Hence, adequate safeguards are in place and both ministers do not see any administrative or institutional problem in light of the administrative provisions.

To ensure project success, a projectised structure is proposed whereby a limited liability company will be formed to implement the project. This entity will benefit from having the singleness of purpose and possession of required resources to implement the project. In light of these measures the project is considered to be quite administratively and institutionally feasible.

10.4 Critical Project Risks

(a) Timely Availability of Funds

For the project to complete implementation within the three years, it is critical that funds are available on a timely basis. Untimely availability of funds could result in a delay in the award of the critical contract dealing with the development of instructional materials which is the most involved project component.

It would be desirable for this contract to be awarded before the summer holidays of 2005 as the input of the teachers from the pilot schools will be needed. It is more convenient for the teachers during the summer holidays. If the contract is awarded after the summer holidays, the project could take close to four years to complete all eleven subjects for the five grades.

(b) Contracting Arrangement for the Instructional Materials

There are several options for the development of the instructional materials. There is a risk that it could take unusually long to get final agreement among the several stakeholders with respect to the option that should be pursued. This is a very critical decision and need to be made carefully as the quality of the materials could be dependent on the option chosen.

11. PROJECT IMPLEMENTATION SCHEDULE

As indicated earlier, the project will be implemented over a three year period but could take closer to four years. Year 1 of implementation will be treated as a Pilot Phase. Lessons learnt during the pilot will serve to inform implementation during the other two years.

(a) Pilot Phase or Phase 1

The Pilot Phase will be particularly important to inform the development of instructional materials. The schools need to take an active part in shaping the instructional materials but from a logistics point of view it will not be practical to work with all 150 schools. The Pilot Phase will therefore comprise twenty (20) schools. The project will therefore commence implementation through 20 selected pilot schools in year 1. Initial testing of instructional materials and feedback will be through the pilot schools. Originally fifteen (15) schools were proposed but based on views of the Minister of Education, Youth and Culture, the number was increased to twenty (20). The MOEYC used a multi-criteria approach to select the schools. The schools were selected on the basis of rural, urban, inner city, males only, girls only, co-educational, traditional, newly upgraded, technical, performing well and average performance. In addition, these schools were selected from three parishes in close proximity to facilitate ease of logistics in implementation activities. The following are the pilot schools selected.

	<u>School</u>	<u>Parish</u>
(i)	Ascot High	St. Catherine
(ii)	Greater Portmore High	St. Catherine
(iii)	Spanish Town High	St. Catherine
(iv)	St. Jago High	St. Catherine
(v)	Glengoffe High	St. Catherine
(vi)	St. Mary's College	St. Catherine
(vi)	Oberlin High	Kingston & St. Andrew
(vii)	Campion College	Kingston & St. Andrew
(ix)	Immaculate Conception	Kingston & St. Andrew
(x)	Mona High	Kingston & St. Andrew
(xi)	Excelcior High	Kingston & St. Andrew
(xii)	Georges College	Kingston & St. Andrew
(xiii)	Donald Quarrie High	Kingston & St. Andrew
(xiv)	Kingston High	Kingston & St. Andrew
(xv)	Denham Town High	Kingston & St. Andrew
(xvi)	Morant Bay High	St. Thomas
(xvii)	St. Thomas Technical High	St. Thomas
(xviii)	Ardenne High	Kingston & St. Andrew
(xix)	Vaxhall High School	Kingston & St. Andrew

Note: The MOEYE to select one other poor performing newly upgraded high school.

(b) Phase 2

Phase 2 will commence in year 2 and will involve the remaining 130 schools. In year two, 60 of the 130 schools will come on stream while the remaining 70 schools will come on stream in year 3. However, it should be noted that in year 2, instructional materials developed will be shared with all schools for review and feedback.

(c) Beyond Phase 2

Based on the experience of the implementation of the project and the perceived needs, a decision will be taken on institutionalization and post-project support.

(d) Project Preparation and Approval

Table 11.1 presents a summary of important project activities completed involving project preparation and approval.

Table 11.1: Summary of Key Activities Already Done

Major Activities	2004/05	2005/06	2006/07	2007/08
1. MCST and ITU signed MOU regarding intervention in education sector	December 2003 (Done)			
2. MCST/MOEYC prepared draft Feasibility Study outlining project design	January – June 2004 (Done)			
3. MCST contracted FocalPoint Consulting to do field work to validate project design and make recommendations for adjustments as necessary	July 2004 (Done)			
4. Consultants performed contract	August – December 2004 (Done)			
5. MCST/MOEYC Reviewed Consultants findings and recommendations and revise Feasibility Study accordingly	January – March 2005 (Done)			
6. Revised draft Feasibility Study submitted to ITU for final comments.	March 2005 (Done)			
7. ITU to review revised draft Feasibility Study and to provide final comments and sign-off on final version		April 2005		
8. Cabinet approved directors of e-Learning Jamaica Ltd.		April 2005 (done)		

(e) Immediate “Next Step” Activities

The immediate “next step activities” are as follows:

- ITU explores other development partners
- Ministerial Order prepared regarding Universal Service Obligations and are to be gazetted shortly
- Mobilization of initial funding to staff PMU
- MCST already identified office accommodation for PMU and lease agreements are to be finalized
- Registration of universal service fund company
- Registration of “e-Learning Jamaica Ltd.”
- Development of detailed job descriptions of key positions
- Advertise positions and recruit personnel
- Finalize initial furniture and equipment for PMU
- Establish bank accounts to receive funds

(f) Detailed Project Implementation Plan (PIP)

A detailed draft Project Implementation Plan (PIP) using Microsoft Project is now being developed. The Board and staff will review and finalize the PIP in due course.

Prepared by:
Ministry of Commerce, Science and Technology
in collaboration with
The Ministry of Education, Youth and Culture
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