

**MINISTRY OF EDUCATION, HUMAN RESOURCE
DEVELOPMENT, SPORTS AND YOUTH AFFAIRS**

DIVISION OF EDUCATION

**STRATEGY FOR IMPLEMENTING
THE
NATIONAL ICT IN EDUCATION POLICY
IN
THE COMMONWEALTH OF DOMINICA
2004 - 2009**

FIRST DRAFT

*Prepared by
Abraham J. Durand BSc., Cert. Ed.*

EDUCATION PLANNING UNIT

MARCH 2004

TABLE OF CONTENTS

Abbreviations	iii
Rationale and Background	1
1.0. Introduction	4
1.1 Strategic Planning for ICT in Education	4
1.2 Status of ICT in Education in the Commonwealth of Dominica	5
1.3 Note on the Presentation	7
3.0 Vision and Mission Statements	8
3.2 Vision	8
3.2 Mission Statement	8
4.0 Flagstone Targets	8
5.0 Underlying Philosophy	9
6.0 Objectives	9
7.0 Strategy for the Implementation of ICT's into the Education System	11
7.1 Planning and Preparation for ICT Initiatives	11
7.2 Infrastructure and Readiness	13
7.3 Training	15
7.4 Utilising ICT in the Curriculum	16
7.5 Utilising ICT in Administration	18
7.6 Sustainability, Maintenance and Support	19
7.7 Evaluating ICT Initiatives	22
8.0 Annual Targets	23
8.1 Targets for 2004-2005	23
8.2 Targets for 2005-2006	23
8.3 Targets for 2006-2007	24
8.4 Targets for 2007-2008	24
8.5 Targets for 2008-2009	24
9.0 Action Plan 2004-2005	25
10.0 References	39
Appendix I: Suggested Org. Structure for Planning/Management of ICT in Educ.	41
Appendix II: Recommended Specifications for Computer Workstations	43
Appendix III: Regulatory Statements	42
Appendix IV: OERU Strategies for Information and Communications Technology	45
Appendix V: Recommended Minimum Specifications for Refurbished Computers	49
Appendix VI: Guidelines for Installing Computer Equipment at Schools and Offices	50
Appendix VII: Recommendations for the Construction of Computer Workstations	55

ABBREVIATIONS

BISS	Basic ICT Skill Set
CRC	Curriculum Reform Committee
CTDs	Cumulative Trauma Disorders
CXC	Caribbean Examinations Council
DTT	District Technical Team
EDP	Education Development Plan
EKN	Educational Knowledge Network
EMIS	Education Management Information System
EPIE	Educational Products Information Exchange
EPU	Education Planning Unit
GHQ	Government Headquarters
ICDL	International Computer Driving Licence
ICT	Information and Communication Technology
ISDN	Integrated Services Digital Network
ISP	Internet Service Provider
ISTE	International Society for Technology in Education
IT	Information Technology
LEC	Legal and Ethical Committee
MOEYAS&HRD	Ministry of Education, Youth Affairs, Sports and Human Resource Development
NGO	Non-Government Organization
NSC	National Steering Committee
OECS	Organisation of Eastern Caribbean States
OERU	OECS Education Reform Unit
OETEC	OECS Education Technical Committee
PMU	Project Management Unit
PPP	Pillars for Partnership and Progress
PTA	Parents Teachers Associations
SC	Software Committee
SLT	School Leadership Team
SPA	Software Publishers Association
TAC	Technical Advisory Committee
TC	Technical Committee
UNESCO	United Nations Educational, Scientific and Cultural Organization
WAN	Wide Area Network
WTO	World Trade Organization

RATIONALE AND BACKGROUND

According to UNESCO¹,

Information and Communication Technology (ICT) permeates the business environment and underpins the success of modern corporations as well as providing government with cost efficient civil service systems. At the same time, the tools and techniques of ICT are of value in the processes of learning, and in the organization and management of learning institutions. The Internet is a driving force, interconnecting both developed and developing countries. Countries must be able to benefit from the technological developments. To be able to do so, a cadre of professionals has to be educated with a sound ICT-background, independent of specific computer platforms or software environments.

The Ministry of Education, Youth Affairs, Sports and Human Resource Development (MoEYAS&HRD) of the Government of the Commonwealth of Dominica, recognizing the sagacity of embracing the opportunities for economic development afforded by an ICT-competent populace, has taken upon itself the imperatives identified by UNESCO in this capstone document. In its thrust to implement education reform in all of its forms, ICT is considered to be one of the pillars upon which quality education for all can indeed become a reality, because of its unique capacity for bringing the world to even the most remote and disadvantaged of communities.

The Holmes Report² identifies that "at all levels, there is a keen interest in information technology. Both government and the private sector are committed to the view that the information technology industry is the primary option for economic transformation especially in light of the daunting prospects for the banana industry." An ICT sub-sector is a viable option viewed by many as a suitable economic alternative that is non-threatening to our eco-environment, while giving us an edge in the knowledge and service industries. This requires an ICT aware, ICT skilled and ICT competent public and workforce, hence the imperative of the expeditious deployment of ICT education in our education system.

In July 1991, the Consultation on Education Reform of the Organization of Eastern Caribbean States (OECS) as part of its recommendations, proposed that member states "commission a study to determine the worthiness of establishing a centralized unit to ensure the appropriate use of the media and new technologies for educational purposes"³. This was in recognition of the fact that information and communications technologies were infiltrating our schools, and that a strategic approach to its implementation was needed if it were to be an economically viable as well as effective addition to the education system.

¹ Haddad, Wadi, and Draxler, A. (Eds.) (2002) *Technologies for Education – Potentials, Parameters and Prospects*. UNESCO/AED: Paris/Washington DC.

² Holmes, Henderson B. (2000). *Situational Analysis on the Information Technology Sub-sector and Matters Related Thereto in the Commonwealth of Dominica*. NDC, Roseau.

³ OERU (1991). *Foundation for the Future*. OERU, Castries.

In December 2000, the OERU in its review and update of its Education Reform Strategy, reiterated and emphasized its belief that “information and communications technology skills can be effectively applied to modernize and enhance teaching, learning and management, mobilize new support for education and provide the infrastructure for regional collaboration, cooperation and the pooling of resources to unprecedented levels.”⁴ *Pillars for Partnership and Progress* – the document coming out of that review – among its many recommendations, provided a recommended strategy framework for the further pursuance of this ideal, and in July 2001, the development of a model policy document for the integration of information and communication technology (ICT) into education systems of the OECS sub region was completed. This model policy document was finalised after a series of review and refinement exercises involving a number key educators from the various islands in the sub region⁵.

The MOEYAS&HRD’s Education Development Plan (EDP), in pursuit of a vision of “Education for All”, committed itself to pursuing an environment where “all students will attend schools which effectively use technology as a resource to support student learning and improve operational efficiency.” Indeed, one of the priorities later identified was “ensuring computer literacy in schools.”⁶ In keeping with this, the OERU’s Model Policy Document has since been customized and fine-tuned to suit our national needs, and the National Policy on ICT in Education in the Commonwealth of Dominica was approved and adopted in February 2004 after a long process of consultation and review.

Meanwhile, the OERU, in its continuing supportive role, had gone ahead and prepared a strategic framework for the implementation of ICT policies in education through a consultancy assignment. Completed in December 2002, the consultant was required to:

- use, as the main point of reference, the OERU’s Model Policy Document for ICT in Education
- examine, with a view to reflect in the strategic framework, the issues discussed and the modifications made to the model policy document in preparing the draft national policies for Dominica and St. Lucia.
- devise strategies for implementing the key policies

In February 2004, the Technical Advisory Committee (TAC) for ICT in education extensively reviewed the strategic framework produced by the consultant at its annual meeting. The committee included proposed

⁴ OERU (2000). *Pillars for Partnership and Progress*. OERU, Castries.

⁵ The steps in the process of refining the model ICT Policy document are outlined in Appendix A.

⁶ Education Planning Unit (July 2001). *Education Development Plan 2000-2005 and Beyond – World Class Education for the 21st Century*. Ministry of Education, Sports and Youth Affairs, Dominica.

timelines for the various activities based on the premise that the strategic plan was intended for a five-year period beginning April 2004.

Simultaneously with the release of this latest document, the MOEYAS&HRD requested that the Strategic Plan for Implementation of ICT's in the Education System of the Commonwealth of Dominica be produced, to provide an immediately implementable framework for the National Policy on ICT in Education recently adopted.

This Draft Strategic Plan document is therefore the latest addition to a long process that has as its end the most effective implementation of ICT's into the education system of the Commonwealth of Dominica.

1.0. INTRODUCTION

1.1 Strategic Planning for ICT in Education

The National ICT Policy document acknowledges that there has been a global shift from industries based on natural resource products towards those based on knowledge and human resource intensive goods and services. Consequently, countries with educational systems that have been effective in the development of the human resource capacity and skills needed for this industrial shift have been more progressive, particularly in the global market environment being promoted by the World Trade Organisation (WTO). ICT has been one of the main areas on which education systems in these countries have placed significant focus.

The Report of the International Commission on Education for the 21st Century identifies a range of "Education Tensions" that exist at the turn of the century. These include global vs local, universal vs individual, spiritual vs material, tradition vs modernity, need for competition vs concern for equality of opportunity, extraordinary expansion of knowledge vs human being's capacity to assimilate it⁷. Much of these tensions have been exacerbated by the insidious presence and impact of ICT's, and so our education system has explored a variety of avenues for developing expertise in ICT, towards the end of harnessing its vast potential for enhancing education administration and for improving teaching and learning processes.

Notwithstanding the tremendous possibilities and benefits offered by ICT, there is a multitude of issues to be addressed in successfully integrating ICT into the education system. ICT, like any powerful tool, can do as much harm as good. Bad pedagogy implemented on a computer may have its harmful effects multiplied many fold by the power of the technology. Further, the introduction and sustainability of ICT in the education system can be very expensive, both in economic and human terms.

Educational leaders and planners are therefore faced with the challenge of (1) ensuring that the introduction of ICT into the classroom is managed with great care so that the potential benefits are realised, while the dangers are eliminated or minimised; and (2) optimizing the benefits of such large investments. Consequently, there is a need for careful planning.

⁷ UNESCO Institute For Information Technologies In Education (2002) *Medium-Term Strategy 2002-2007*. IITE, Moscow.

This document presents a strategic framework for implementing ICT in the education system of the Commonwealth of Dominica, borrowing generously from the OERU's Model Strategic Plan document, but also builds on the strategies for ICT presented in the Pillars for Partnership and Progress (PPP)⁸, as well as regional and international ICT implementation strategies.

1.2 Status of ICT in Education in the Commonwealth of Dominica

To date, the ICT Desk at the Education Planning Unit (EPU) of the MoEYAS&HRD has been monitoring the progress of ICT within the Division of Education, and a series of status reports produced. In the most recent status update, dated December 2003, the following was reported⁹:

1.2.1 ICT Infrastructure and Equipment:

All schools and offices of the MoHRDS&YA have access to electricity and telephone lines. The electricity supply, however, as also noted by Holmes (2000), is neither reliable nor clean. 56K dialup Internet service is provided to any schools which have the capacity to use it (i.e. a computer with a MODEM); 100% of secondary schools and 40% of primary schools have availed themselves of this service. In 35% of these schools, access is limited to one computer, in the principal's office, while in 12% of the schools, the service is distributed over a network. Broadband Internet service is not available throughout the island, and none of the schools have the use of this service.

All offices of the MoEYAS&HRD are equipped with computers and a variety of related peripherals. The ESTB is now being provided with a high capacity network, including a 256K broadband Internet feed, and plans are underway for establishing a similar network at GHQ.

In total, there are 180 computers located at 15 secondary schools, 36% of which are more than 5 years old, and 53% are 2 to 5 years old. 12 of the secondary schools are served by peer-to-peer networks and one client-server network. There are 181 computers located at 42 of the 64 primary schools on the island, 75% of which are more than 5 years old. 11 of the primary schools have peer-to-peer networks installed. Networks are used for file, printer and Internet sharing services. The computer to student ratio at secondary school is therefore 1:38, while that at primary schools is 1: 58.

⁸ The objectives and the reform strategies presented in the PPP are outlined in Appendix E.

⁹ Durand, A., (2004). *The State of Information and Communications Technology in the Department of Education of the Ministry of Education, Sports and Youth Affairs in the Commonwealth of Dominica – A Status Report, December 2003*. Education Planning Unit, Roseau.

1.2.2 Human Resource Capacity:

The State of ICT Report estimates that over 65% of the officers at MOEYAS&HRDs are computer literate; literacy at the school level (teachers and school administrators) was estimated at 45%. The ICT Desk of the EPU has been conducting training for educators at various levels covering a variety of content areas, including maintenance and servicing, networking, curriculum integration, data management and software solutions.

1.2.3 ICT in the Curriculum:

In schools where it is possible to offer ICT education to students, ICT is treated as a subject in which basic computer skills (primarily Microsoft productivity tools and Internet usage) are taught for an hour a week. Additionally, 50% of secondary schools offer Information Technology as an added option to some students at the CXC level. The program commences in Form III at some schools, and from Form IV at others, and the Technical Proficiency program is the preferred choice. Limited numbers of computers make these the only possible options for most schools. Curriculum integration of ICT is still a new concept, but one which schools are willing to embrace because of its wider implications for and application to learning.

In 2003, Dominica was selected as a pilot site for the integration of ICT in the teaching of Language Arts and Mathematics at the lower secondary level. Four (4) teachers at one (1) school participated in this exercise, which was being carried out simultaneously in two (2) other territories under OERU leadership. The final OERU report on this exercise is still pending.

1.2.4 Technical support:

The responsibility for the coordination and implementation of activities specific to ICT in education and for handling technical support issues lies with the ICT Desk at the Education Planning Unit of the MoHRDS&YA. Manned by two full-time officers – a Coordinator and more recently an IT Specialist – the ICT Desk has been providing training and support for teachers interested in developing expertise in computer maintenance and networking.

Under its teacher technician program, 45 teachers have completed a one-week module of hands-on training Fundamentals of Computer Maintenance and Networking. Due to a variety of circumstances, less than 20 of these function effectively to date. Technicians address immediate problems to the ICT

Desk, which provides online guidance and support. More challenging issues are addressed by Desk personnel, or referred for outsourced attention, at the cost of the school.

ICT in schools is currently not standardized or regulated by MOEYAS&HRD, whose role is limited to the reporting, training and monitoring done by the ICT Desk. Significantly greater levels of organization, planning and investment is therefore necessary if ICT is to yield optimal benefits, and if it is to be made accessible to every learner, educator and administrative employee.

1.3 Note on the Presentation

The Strategy statements in this document do not coincide with the Policy Statements in the National Policy document sequentially. This is in an effort to present the strategies in a time sequence that leads to full implementation. The relevant Policy Statements, however, are referenced with each Strategy as it is presented.

Vision and mission statements for ICT in education in the Commonwealth of Dominica are presented, and then some Flagstone Targets for the five-year period of implementation are identified. The Underlying Philosophies and Objectives proposed in the National Policy document are reiterated, primarily for ease of reference. Strategy statements are then presented, with a set of guiding philosophies and a series of actions that are intended to adequately accomplish the strategy.

Targets are identified for each financial year of the five year implementation period and an Action Plan for the first year completed.

Appendices I to IV present extracts from specific documents referenced in the paper, particularly where they are deemed useful immediate reference material. Appendix V provides a suggested organizational structure for the planning an management of ICT in the MoEYAS&HRD .

3.0 VISION AND MISSION STATEMENTS

3.1 VISION

An education system that produces graduates who are capable of functioning effectively in the information age as well as contribute meaningfully to its further development.

3.2 MISSION STATEMENT

To harness the potential of ICTs as a means of enhancing the administrative and teaching/learning processes towards the generation of a workforce compatible with the demands of the information age.

4.0 FLAGSTONE TARGETS

BY THE END OF YEAR 5 OF IMPLEMENTATION OF THIS STRATEGIC PLAN, THE FOLLOWING WILL HAVE BEEN ATTAINED:

- ✚ AN ORGANIZATIONAL AND ADMINISTRATIVE STRUCTURE ESTABLISHED FOR MANAGING ICT IN EDUCATION
- ✚ MECHANISMS ESTABLISHED FOR REGULATING THE VARIOUS ASPECTS OF ICT'S
- ✚ ALL SCHOOLS EQUIPPED WITH ADEQUATE ICT HARDWARE
- ✚ APPROPRIATE SOFTWARE TOOLS AND SOLUTIONS PROVIDED TO ALL SCHOOLS.
- ✚ ALL PERSONNEL PROVIDED WITH RELEVANT AND TIMELY TRAINING
- ✚ THE NATIONAL CURRICULUM ADAPTED FOR INCLUSION AND INTEGRATION OF ICT'S
- ✚ A WIDE AREA NETWORK (WAN) ESTABLISHED TO LINK MOEYAS&HRD OFFICES AND ALL SCHOOLS
- ✚ A MOEYAS&HRD-WIDE INTRANET ESTABLISHED
- ✚ AN EFFECTIVE INTERACTIVE MOEYAS&HRD WEBSITE ESTABLISHED
- ✚ MOEYAS&HRD WAN EFFECTIVELY LINKED TO NATIONAL WAN
- ✚ AN EDUCATION MANAGEMENT INFORMATION SYSTEM (EMIS) IMPLEMENTED
- ✚ RESEARCH ON ICT RELATED ISSUES CONDUCTED, DOCUMENTED AND CIRCULATED
- ✚ PROCUREMENT AND IMPLEMENTATION OF HARDWARE AND SOFTWARE REGULATED
- ✚ MECHANISMS FOR EFFECTIVE MAINTENANCE, SERVICING OF HARDWARE AND SOFTWARE ESTABLISHED
- ✚ STUDENTS AND EDUCATORS PARTICIPATE EFFECTIVELY IN EDUCATIONAL KNOWLEDGE NETWORKS (EKNs)
- ✚ THE SUSTAINABILITY OF THE NATIONAL ICT SOLUTION ENSURED

5.0 UNDERLYING PHILOSOPHY

The Ministry of Education, Sports & Youth Affairs recognizes that:

- ✚ Accessibility to and utilization of Knowledge is fundamental to the development of the Country's citizen.
- ✚ In light of the growing impact of advanced Information and Communication Technologies (ICTs) on the economy of the Country each student should be provided with access to computer-based tools so as to make a valid contribution to society.
- ✚ ICT must be exploited to allow students greater control over their learning and thus develop skills at their own level and speed.
- ✚ The integration of ICT in the education system could eventually boost the economic engine of the Country since it provides a leveled "playing field for the creation and distribution of software, information, etc by its Citizens.
- ✚ The potential of all individuals (including the mentally and physically challenged) could be enhanced by the use of multimedia packages and other electronic learning tools i.e. ICT promotes individualized interactivity.
- ✚ The introduction of ICT in the Education Sector necessitates the training of all teachers in the system and in essence implies the need for lifelong learning of all stakeholders;
- ✚ The implementation and sustenance of ICT projects in the Education System will be via a partnership approach involving the community, private and public organizations, and funding agencies.
- ✚ The utilization of computerized management tools within educational institutions could enhance the effectiveness and efficiency of the educational sector
- ✚ The availability of authoring packages for use by teachers in the development of their own instructional material will have positive impact on the teaching-learning process.

6.0 OBJECTIVES

The MOEYAS&HRD reiterates the following objectives identified in the MOEYAS&HRD ICT in Education Policy Document, towards the optimal utilization of ICT's in the education system:

- ✚ Promote equitable access to educational resources through the strategic application of ICT
- ✚ Make all school leavers computer literate thereby providing them with the requisite ICT skills as a platform for imminent employment and/or entry to specialised training for the information economy.
- ✚ Create a teaching force in which all practitioners possess the critical requisite skills and competencies required to use ICT as a tool in enhancing the teaching/learning process and a cadre of ICT teacher specialists

- ✚ Improve the efficiency and effectiveness of educational administration through the promotion of the use of appropriate school management information systems.
- ✚ Exploit the interactive potential of Information and Communications Technology in the provision of life long learning, anytime, anywhere via distance education programmes.
- ✚ Create smart partnerships for a sustainable ICT programme through collaboration among the public, private and community sectors.
- ✚ Establish a schools network system for the collaborative sharing of educational resources and stakeholder participation
- ✚ Employ the new ICT tools for increased online communication, stakeholder participation and improved management of the sector.
- ✚ Foster the concept of Life Long Learning among students and teachers and also within the general population of the Country.
- ✚ Encourage the principals, teachers and students within the education system to be involved in the development of applications and to use ICT, meaningfully, to enhance the teaching-learning process.
- ✚ Ensure that there exists equitable access to ICT resources by all students and teachers within the Education system.
- ✚ Demonstrate the MOES&YA's intention at providing a reasonable level of Computer Literacy to all students and teachers in the system.
- ✚ Encourage and facilitate the use of the Internet as a research and communication tool among students, parents, teachers, principals, other MOES&YA officials and members of the community.
- ✚ Facilitate the implementation of an Education Management Information System (EMIS) so as to ensure the effective management of the Education system.
- ✚ Encourage partnerships between the various stakeholders in the Education Sector.
- ✚ Provide the avenue for increased electronic networking of educators in Dominica and overseas.
- ✚ Foster greater professional development opportunities for all educators.

7.0 STRATEGY FOR THE IMPLEMENTATION OF ICT'S INTO THE EDUCATION SYSTEM OF THE COMMONWEALTH OF DOMINICA

7.1 PLANNING AND PREPARATION FOR ICT INITIATIVES

Guiding Philosophies

The Ministry of Education believes that:

1. There is need for an organisational and managerial structure that oversees and/or coordinates activities relating to ICT in the education system.
2. It is through partnership and collaboration between educators, parents, employers, students and other stakeholders that the vision of the strategic plan can become a reality.
3. There is a need for the adoption of standards for the acquisition, implementation and use of ICT
4. Principals and other leaders in schools must assume ownership of school level ICT projects.

Strategy 1: *Facilitate the planning and management of the integration of ICT into the education system.*

- 1.1 Re-examine the structure, composition and function of the existing ICT Team of the MOEYAS&HRD with a view to establishing an ICT Department that has the capacity to manage national ICT projects in education.
- 1.2 Establish an ICT in Education National Steering Committee (NSC) comprising representatives of stakeholders in the education system.
- 1.3 Empower the NSC to oversee and effectively manage the integration of ICT in the education system.
- 1.4 Establish committees comprised of educators, teachers and other significant contributors, that will be responsible for reporting to and advising the ICT Department and National Steering Committee on specific issues¹⁰.
- 1.5 Provide appropriate training to all individuals involved in the planning and management of ICT.

¹⁰ Some recommended committees are:

Legal/Ethical/Regulatory
Software Evaluation and Selection
Technical Committee (Hardware Selection, Acquisition, Maintenance and Servicing)
Curriculum Development and Integration
(see also Appendix I)

- 1.6 Conduct a comprehensive needs assessment and consultation to determine the needs of all stakeholders.

Strategy 2: *Adopt a common set of standards for ICT systems and issues.*

- 2.1 Institute a set of rules and procedures for acceptable use of ICT in the education system.
- 2.2 Formulate and adopt a policy and guidelines for acceptable use of the Internet¹¹ and online information resources.
- 2.3 Develop a regulatory framework and policy guidelines for the acquisition, use and distribution of software.
- 2.4 Develop a comprehensive set of standards for the various pieces of hardware and software that are likely to be used in the education system.
- 2.5 Design guidelines for access and publication of data on students.
- 2.6 Develop standards for the proper disposal of computer equipment.
- 2.7 Develop clear guidelines for the procurement/acquisition of equipment.
- 2.8 Develop a baseline set of competencies for teachers and students.
- 2.9 Develop standards/specifications for appropriate construction of new educational institutions.
- 2.10 Develop standards for the design and deployment of furniture and equipment.
- 2.11 Ensure that suppliers are aware of the specifications developed by the MOEYAS&HRD for the procurement of equipment and furniture.

Strategy 3: *Facilitate schools in taking ownership of and responsibility for ICT resources at their locations.*

- 3.1 Encourage the formation of school ICT leadership and implementation teams.
- 3.2 Provide training in the development of technology plans to members of the school ICT leadership and implementation teams.

¹¹ Refer to Appendix B for Regulatory Statements on Acceptable Use of Online Information Resources

3.3 Assist schools in preparing ICT Development Plans that are inline with the national plan, and endorse completed plans.

3.4 Monitor the progress of the implementation of the technology plan in each school.

Strategy 4: *Attract and retain teachers with ICT skills and aptitudes within the education system.*

4.1 Actively seek/develop training opportunities for continuous professional development for teachers and other educators in various areas of ICT.

4.2 Reduce the teaching workload of ICT skilled teachers who are given non-teaching responsibilities that support ICTs.

4.3 Encourage the development of marketable products by ICT skilled teachers and the payment of royalties to these teachers.

4.4 Stipulate clearly in Teachers' Job Specifications the minimum requirements in respect to ICT competencies.

4.5 Provide recognition and incentives for teachers who excel in ICT use and innovation.

4.6 Require that applicants for teaching posts possess minimum ICT requirements.

7.2 INFRASTRUCTURE AND READINESS

Guiding Philosophies

The Ministry of Education believes that:

1. It is imperative that a sturdy and reliable infrastructure is a necessary prerequisite for ICT implementation;
2. Educational institutions must be at a reasonable state of readiness and awareness for the effective implementation of ICT's
3. Attention must be paid to health and safety factors as pertains to ICT
4. ICT equipment should be deployed according to optimal internationally acceptable standards.

Strategy 5: *Establish the necessary infrastructure to facilitate the installation of ICT within the education system.*

5.1 Undertake assessment of the physical environment in all educational institutions including the MOEYAS&HRD in order to determine physical and technical infrastructure requirements.

- 5.2 Develop a phased plan for retrofitting existing institutions to support technology-enriched learning environment.
- 5.3 Review the design and deployment of furniture and equipment currently installed at schools and offices of the MOEYAS&HRD, as per strategy 2.
- 5.4 Retrofit and/or construct ICT furniture and equipment at schools and offices.
- 5.5 Conduct an assessment of existing networks within the education system and propose how they can be interlinked.
- 5.6 Prepare a detailed design of a cost effective, equitably distributed and secure national network utilizing the most effective available technologies.
- 5.7 Prepare a phased plan for installing the network.
- 5.8 Implement a national MOEYAS&HRD wide area network.
- 5.9 Establish a MOEYAS&HRD intranet utilizing the most current, efficient and secure technologies available.
- 5.10 Configure MOEYAS&HRD servers to provide Internet access services for all schools

Strategy 6: *Ensure suitability/readiness of school environment/climate for incorporation of ICT's.*

- 6.1 Undertake a comprehensive assessment of the teaching/learning readiness of schools for the introduction of ICTs
- 6.2 Undertake a formal assessment of current teacher competencies in ICT's.
- 6.3 Conduct educational programs to inform students, teachers, parents of the capabilities and limitations of an ICT environment, including networks and the Internet.
- 6.4 Conduct awareness programs on acceptable use of ICT in educational institutions.
- 6.5 Incorporate guidelines for acceptable use of ICT into School Rules and into policies in other parts of the education system.
- 6.6 Disseminate information pertinent to ergonomics¹² and Cumulative Trauma Disorders¹³ (CTDs) among all computer users in the education system.

¹² Ergonomics is the science of how the body performs desired tasks most efficiently

¹³ Cumulative Trauma Disorders (CTDs) are injuries that arise from putting excessive pressure on the body to perform the same task over a period of time.

7.3 TRAINING

Guiding Philosophies

The Ministry of Education believes that:

1. The introduction of ICT in the Education Sector necessitates the training of all teachers in the system and in essence implies the need for lifelong learning of all stakeholders
2. All teachers should be confident computer-users who transmit positive attitudes to students.
3. Teachers of individual subjects should be trained in the applications of ICT to their content areas.
4. A strong cadre of highly trained lead personnel is required to ensure the sustainability and growth of ICT implementation
5. Effective deployment of ICTs in education requires training in content- and learner-specific situations like access for disabled persons and special needs students

Strategy 7: *Provide appropriate training to teachers before they attempt to introduce the use of ICT's in the classroom.*

- 7.1 Provide teacher training institutions with specific information on the general ICT skills and the subject specific skills required for entry into the teaching service, as well as for use in the classroom.
- 7.2 Review the existing teacher training program in order to determine and recommend changes necessary to prepare teachers for incorporation of ICT's.
- 7.3 Make training materials available to teachers and educators by whatever means become possible.
- 7.4 Encourage the procurement of educational technology that must be used by teachers, and assist in providing training in their utilization.
- 7.5 Identify and/or develop distance education and/or part-time programs for in-service teachers.
- 7.6 Encourage and support enrolment in the ICT teacher education programs.
- 7.7 Provide rewards/incentives to teachers who have advanced significantly in ICT-related programs.

Strategy 8: Provide training for principals of schools in management of technology, and ICT as a managerial tool.

- 8.1 Conduct review of competencies of school principals and officers charged with school administration in ICT management and use of ICTs for management.
- 8.2 Source and provide training opportunities in ICT management and use of ICTs for management for school administrators and officers involved with school administration.
- 8.3 Require that all relevant educators avail themselves of available training opportunities

Strategy 9: Provide opportunities/support for higher level training for educators in advanced areas of ICT.

- 9.1 Maintain a database/inventory of ICT competencies among MOEYAS&HRD staff including school personnel and Committee members.
- 9.2 Identify personnel with aptitude/desire to pursue higher level training in ICT.
- 9.3 Seek and make available opportunities and/or support for higher level ICT training for selected personnel particularly in key areas of need.

7.4 UTILISING ICT IN THE CURRICULUM

Guiding Philosophies

The Ministry of Education recognizes that:

1. Accessibility to and utilization of knowledge are fundamental to the development of the country's citizenry;
2. In light of the growing impact of advanced Information and Communication Technologies (ICTs) on the economy of the country, each student must be provided with access to up-to-date computer-based tools so as to make a valid contribution to society;
3. The integration of ICT in the education system can eventually boost the economic engine of the country because courseware developed by local educators can be exported;
4. Curriculum reform is necessary for ICT to be introduced and utilised effectively in the classroom;
5. ICT must be exploited to allow students greater control over their learning and thus develop skills at their own level and speed;
6. ICT is an innovative vehicle by which students can more readily explore broader world views and their own self-actualization;
7. The potential of all individuals (including those with special needs) can be enhanced by the use of ICT learning tools;
8. Equity of access must be an overriding consideration in any ICT programme being implemented;

9. The availability of authoring packages for use by teachers in the development of their own instructional material can have positive impact on the teaching-learning process;
10. Software selected for use in the curriculum must be carefully selected to ensure appropriate content, linguistic and cognitive style as well as cultural appropriateness
11. National and international copyright laws must be respected by all individuals involved in the incorporation of ICT into the education system;
12. The introduction of ICT in the Education Sector necessitates the training of all personnel of the MOEYAS&HRD, and familiarity with the processes involved;

Strategy 10: *Facilitate equitable access to ICT for all students.*

- 10.1 Establish targets for student and community access to ICT.
- 10.2 Develop regulatory framework to address access constraints.
- 10.3 Enhance existing and establish new school/community technology centres.

Strategy 11: *Implement configuration(s) that is (are) optimal for teaching/learning with ICT's.*

- 11.1 Research the use and efficacy of various ICT configurations from documentation and/or the experience of others.
- 11.2 Pilot various configurations at different locations and under varying circumstances in order to determine the most practical and effective.

Strategy 12: *Integrate ICT's into the curriculum.*

- 12.1 Create guidelines on how ICT skills can be incorporated at various levels and in various subject areas.
- 12.2 Examine critically the existing curriculum with the view to including ICT's as an additional teaching/learning mechanism.
- 12.3 Prepare or adopt a two-tiered package comprising a Basic ICT Skill Set (BISS) using existing documentation (e.g. ICDL) and/or teacher experiences – Level I to be completed by end of Primary and Level II to be completed by end of Lower Secondary (Form III).
- 12.4 Prepare a teacher orientation package on integration of ICT's in the teaching/learning process using existing research and documentation (eg. *ICT Learning Outcomes*), to include ideas for all subject areas.
- 12.5 Use BISS to ensure that all students are computer literate to appropriate BISS level.

- 12.6 Provide opportunities for CXC or other certification levels as an option for students of Upper Secondary Level.
- 12.7 Provide opportunities for access to, and use of ICT resources by students of technical and vocational education programs, the arts and science.
- 12.8 Develop instructional methods (or modify existing ones) that utilize ICT's to meet the needs, interests and learning styles of individual students, particularly those with special needs.
- 12.9 Explore the use adaptive technologies for special needs students (e.g. visual, hearing, and physically impaired).
- 12.10 Establish special programs for students with learning disabilities and for students who are gifted or talented.
- 12.11 Encourage attendance of teachers and educators at ICT-related conferences, expositions, etc. in order to explore the potential of ICT in education.
- 12.12 Host competitions and technology fairs/conventions to showcase the work and accomplishments of teachers and students.
- 12.13 Provide opportunities and/or support for training to teachers and students who demonstrate an aptitude for development of quality results/products.
- 12.14 Seek endorsement of and market opportunities for quality results/products by reputable institutions (e.g. ISTE and SPA).
- 12.15 Provide access for students and teachers to international knowledge networks and shared educational resources.
- 12.16 Encourage the sharing of experiences (lessons learnt and best practices) in relevant meetings and fora.
- 12.17 Conduct evaluations of ICT and ICT integration programs on an annual basis.

7.5 UTILISING ICT IN ADMINISTRATION

Guiding Philosophies

The Ministry of Education recognizes that:

1. The utilization of computerized management tools can strengthen the institutional capacity of the Ministry, education offices and schools.

2. Readily available timely data can enhance administrative capacity for more effective decision-making.

Strategy 13: *Acquire and implement various easily integrated information systems.*

- 13.1 Evaluate various types of information management systems and applications that can be used in education administration.
- 13.2 Acquire or develop suitable information system(s).
- 13.3 Implement the information systems acquired or developed using the most suitable configuration.
- 13.4 Provide appropriate training to teachers, principals and officers at all levels of the education system in the setting up and utilization of the EMIS solution.

7.6 SUSTAINABILITY, MAINTENANCE AND SUPPORT

Guiding Philosophies

The Ministry of Education recognises that:

1. The introduction of ICT based educational programmes will require an increase in funding for the resources necessary to accomplish the goals of these programmes;
2. Time, management support, commitment, teamwork, and flexibility are required to guarantee successful implementation and acceptance of technology;
3. The provision of technical support is essential to successful implementation of ICT initiatives;
4. ICT equipment has a finite life span due to wear and technological obsolescence.
5. Flexible, open and upgradeable architectures are preferable, because of the rapidly evolving nature of the technology
6. ICT equipment would best be installed according to agreed national and regional standards to ensure optimal connectivity
7. Effective monitoring of ICT inventory and maintenance will assist towards sustainability
8. Regular, scheduled maintenance ensures the health of ICT equipment
9. Functional and reliable ICT equipment is a significant factor in the sustainability and continuity of ICT programs

Strategy 14: *Facilitate funding mechanisms for ICT implementation.*

- 14.1 Include funding for ICT and ICT-related activities in annual national budget preparation.

- 14.2 Seek external funding and other forms of assistance from various organisations.
- 14.3 Facilitate attendance at meetings and conferences at which personalized contact can be made with key personnel from potential funding agencies / sponsors.
- 14.4 Facilitate the establishment of and/or participation in networks through which contacts can be made with key personnel from funding agencies.
- 14.5 Establish partnership programs with local and international partners for funding at school or national levels.
- 14.6 Encourage fund raising activities at school and national levels.

Strategy 15: Foster constructive partnerships with private sector and NGO organizations for ICT development.

- 15.1 Establish private sector / NGO partnership programmes for sharing of hardware, software, materials and training for ICT activities.
- 15.2 Provide special concession to businesses that fund ICT project in schools.
- 15.3 Engender international partnerships with organizations/friendly governments willing to provide ICT equipment, material, research and training.
- 15.4 Foster cooperation at various levels in negotiating contracts with major suppliers (e.g. inter-institutional, national, bilateral or inter-national, and regional).
- 15.5 Work cooperatively with participating agencies in significant areas e.g. policy/ strategy formulation, research and development, human resource networking, train-the-trainer programmes.
- 15.6 Host public relations programmes to highlight the benefits of ICT in education and the various ways in which the community, business, professional associations and individuals can help.
- 15.7 Tap into international overseas volunteer programs for necessary ICT-related technical and training expertise.

Strategy 16: Adopt a prudent approach in the procurement and management of ICT hardware and software.

- 16.1 Develop and maintain a regularly updated database of vendors/suppliers of ICT-related merchandise.

- 16.2 Establish a protocol for procurement of ICT merchandise.
- 16.3 Ensure that written agreements are signed between the MOEYAS&HRD and suppliers that are awarded contracts for providing ICT-related merchandise and services.
- 16.4 Explore a variety of options for acquisition of ICT equipment e.g. leasing as opposed to buying.
- 16.5 Develop and implement a strategy for the standardization of ICT equipment throughout the island.

Strategy 17: *Ensure an effective maintenance and technical support mechanism.*

- 17.1 Provide basic initial training to users to ensure ICT resources are protected from end-user misuse.
- 17.2 Identify and train individuals at schools and offices to perform basic troubleshooting and minor repairs.
- 17.3 Perform preventive and predictive maintenance at regularly scheduled intervals.
- 17.4 Establish a protocol for internal servicing and referring ICT hardware for outsourced servicing.
- 17.5 Implement a maintenance management system to track, schedule and cost maintenance of ICT equipment.
- 17.6 Compile and regularly revise a list of reputable technical service providers who can serve schools in their communities.

Strategy 18: *Encourage the local generation of revenue to maintain ICT equipment.*

- 18.1 Encourage schools to utilize ICT resources in creative ways to generate funds.
- 18.2 Undertake community awareness programs on the benefits of ICT competencies and to encourage the use of school ICT facilities for a minimal fee.
- 18.3 Establish non-discriminatory cost recovery mechanisms for public access to computers installed in schools.
- 18.4 Ensure that schools manage and account for revenue generated from community access programs responsibly.

7.7 EVALUATING ICT INITIATIVES

Guiding Philosophies

The Ministry of Education recognises that:

1. It is necessary to perform ongoing evaluation of the extent and impact of the implementation of the strategies in the ICT plan.
2. Review and revision of ICT policy and practice keeps the process more current and incisive.
3. Continuous Research in ICT related issues is necessary, given the volatile and ever-changing nature of modern technology

Strategy 19: *Encourage and support research on and evaluation of the impact of ICT in the education system.*

- 19.1 Provide opportunities for participation in workshops, training programmes, and relevant forums on issues pertinent to ICT in education.
- 19.2 Keep abreast with regional and international developments in ICTs.
- 19.3 Regularly investigate the most commonly used ICT tools currently on the market.
- 19.4 Publish local research findings locally and internationally using available media.
- 19.5 Facilitate local access to regional and international research findings.

Strategy 20: *Perform an annual review of ICT initiatives.*

- 20.1 Provide Terms of Reference and reporting mechanisms for the annual review.
- 20.2 Facilitate the annual review

8.0 ANNUAL TARGETS

8.1 TARGETS FOR 2004-2005

- ✚ ESTABLISH ALL COMMITTEES
- ✚ UPGRADE SELECTED PRIMARY SCHOOLS
- ✚ UNDERTAKE RESEARCH INTO WIDE AREA NETWORK IMPLEMENTATION
- ✚ REVIEW NATIONAL CURRICULA T INCLUDE ICTs
- ✚ PROVIDE INITIAL TRAINING FOR ALL PERSONNEL
- ✚ ESTABLISH SCHOOL TECHNOLOGY TEAMS
- ✚ PILOT DONATED EMIS SOFTWARE AT SELECTED SECONDARY SCHOOLS
- ✚ DEVELOP GUIDELINES AND STANDARDS FOR EFFECTIVE ICT IMPLEMENTATION
- ✚ HOST INTERNET FIESTA

8.2 TARGETS FOR 2005-2006

- ✚ ANNUAL REVIEW OF ICT ENVIRONMENT
- ✚ IMPLEMENT INSTALLATION OF WIDE AREA NETWORK
- ✚ PROVIDE ONGOING TRAINING TO ALL PERSONNEL
- ✚ UPGRADE SELECTED SECONDARY SCHOOLS
- ✚ UPGRADE SELECTED PRIMARY SCHOOLS
- ✚ IMPLEMENT REVISED CURRICULA
- ✚ REVIEW YEAR I ACTIVITIES
- ✚ BEGIN PROCESS OF EMI S SELECTION
- ✚ HOST REGIONAL ICT IN EDUCATION CONFERENCE

8.3 TARGETS FOR 2006-2007

- ✚ ANNUAL REVIEW OF ICT ENVIRONMENT
- ✚ COMPLETE CONFIGURATION OF WAN
- ✚ PROVIDE ISP SERVICES FOR ALL MOEYAS&HRD ENTITIES
- ✚ CONTINUE TRAINING
- ✚ COMPLETE SECONDARY SCHOOLS UPGRADE
- ✚ UPGRADE SELECTED PRIMARY SCHOOLS
- ✚ HOST ICT IN EDUCATION EXPO
- ✚ IMPLEMENT EMIS SOLUTION
- ✚ CONNECT WITH EXTERNAL PARTNER ICT SERVICES VIA SATELLITE

8.4 TARGETS FOR 2007-2008

- ✚ ANNUAL REVIEW OF ICT ENVIRONMENT
- ✚ PROVIDE OPPORTUNITIES FOR ADVANCED ICT TRAINING
- ✚ COMPLETE PRIMARY SCHOOLS UPGRADE
- ✚ MAINTENANCE AND UPGRADE OF WAN
- ✚ HOST SECOND BIENNIAL REGIONAL ICT IN EDUCATION CONFERENCE
- ✚ MAJOR ROLLOVER OF HARDWARE
- ✚ REVIEW OF EMIS SOLUTION

8.5 TARGETS FOR 2008-2009

- ✚ ANNUAL REVIEW OF ICT ENVIRONMENT
- ✚ REVIEW OF THE FIVE (5)-YEAR PLAN
- ✚ SETTING OF NEW DIRECTIONS
- ✚ ROLLOVER OF HARWARE
- ✚ HOST SECOND ICT IN EDUCATION EXPO
- ✚ HARMONIZATION OF OUTSTANDING ICT INITIATIVES WITH REGIONAL INITIATIVES

9.0 ACTION PLAN 2004-2005

9.1 NOTES

1. Training Workshop participation is costed at EC\$ 25.00 per participant per day, representing the mean cost of transportation and a mid-morning snack.
2. Dates cited in "BY WHEN" field represent terminal dates for activities.
3. Costing for school upgrades include all or some of the following, as needs dictate:
 - a. infrastructural works
 - b. furniture
 - c. basic equipment
 - d. air conditioning
 - e. security
4. The following are also assumed:
 - a. The ICT Department will be appropriately staffed to enable it to undertake the massive coordination that will be required to execute this Action Plan.
 - b. Leave of absence will be permitted for teachers selected to serve on committees to attend meetings/training sessions.
 - c. Funding mechanisms will be provided for implementation of the plan.
 - d. All parties concerned will give their full cooperation.

9.2 ACTION PLAN 2004-2005

STRATEGY	ACTIVITY	BY WHOM	INDICATOR	SOURCE OF VERIFICATION	BY WHEN	COST	EXPECTED RESULTS
Strategy 1: <i>Facilitate the planning and management of the integration of ICT into the education system.</i>	1.1 Re-examine the structure, composition and function of the existing ICT Team of the MOEYAS&HRD with a view to establishing an ICT Department that has the capacity to manage national ICT projects in education.	CEO, SPO RPU, PMU, PS Educ., Min of Educ., ICT Desk	Revised ICT Department Established	CEO Memo	Aug 04	0.00	Effective coordination of the implementation of the strategic plan for ICT in education. A representative body that will advocate and communicate the issues and impact of ICT programmes to policy makers.
	1.2 Establish and empower an <i>ICT in Education National Steering Committee</i> (NSC) comprising representatives of stakeholders in the education system.	CEO, SPO-EPU, PMU, PS Educ., Min of Educ. , ICT Desk	National Steering Committee Established	Ministerial Approval instrument	Jul 04	0.00	Valuable input to the planning process from individuals who have extensive experience and expertise in a wide-range of uses of ICT.
	1.3 Establish committees as per Appendix IV of Strategy Paper.	CEO, SPO-EPU, PMU, PS, Min of Educ.	Committees formed and mandated	CEO Memo	Aug 04	0.00	Reduction or elimination of duplication of effort by entities that would normally work in isolation in the absence of a coordinating body.
	1.4 Hold a three-day training workshop in the planning and management of ICT.	ICT Dept, NSC	Workshop held	Workshop Report submitted to supervisor	Sep 04	2,250.00	
	1.5 Conduct a comprehensive needs assessment and consultation to determine the needs of all stakeholders.	ICT Desk, NSC, Local Consultant	Consultation Report completed and submitted to NSC and CEO	Consultation Report	Sep 04	5,000.00	

STRATEGY	ACTIVITY	BY WHOM	INDICATOR	SOURCE OF VERIFICATION	BY WHEN	COST	EXPECTED RESULTS
Strategy 2: <i>Adopt a common set of standards for ICT systems and issues.</i>	2.1 Institute a set of rules and procedures for acceptable use of ICT in the education system.	ICT Dept., NSC	2.1 – 2.10 A comprehensive set of rules, procedures and guidelines for the implementation of ICT's in Education completed and submitted.	Rules, Procedures and Guidelines for the Implementation of ICT's in Education document	Feb 05	0.00	Reduction in the illegal acquisition and distribution of software.
	2.2 Formulate and adopt a policy and guidelines for acceptable use of the Internet and online information resources.	ICT Dept., NSC, CRC					A mechanism to enforce the legislation that has been developed.
	2.3 Develop a regulatory framework and policy guidelines for the acquisition, use and distribution of software.	ICT Dept., NSC, SC					Reduction in health hazards that may result from the inappropriate disposal of computer equipment.
	2.4 Develop a comprehensive set of standards for the various pieces of hardware and software that are likely to be used in the education system.	ICT Dept., NSC, SEC, SC, TC					Awarding of contracts being done in a transparent and impartial manner.
	2.5 Design guidelines for access and publication of data on students.	SEC, LEC, NSC					Reduction in the wastage of funds that could result from the purchase of inappropriate equipment by individuals who do not have adequate technical knowledge.
	2.6 Develop standards for the proper disposal of computer equipment.	TC, SEC, NSC, LEC					More caution being exercised in accepting donated used equipment and reduction in the negative consequences of doing so.
	2.7 Develop clear guidelines for the procurement/acquisition of equipment.	ICT Desk, TC, SEC, NSC					Reduction in the indiscriminate use of instructional software in the learning environment.
	2.8 Develop a baseline set of competencies for teachers and students.	CRC, SLT, NSC					Decrease in damaging effects of using software with inaccurate content and poor pedagogical techniques

STRATEGY	ACTIVITY	BY WHOM	INDICATOR	SOURCE OF VERIFICATION	BY WHEN	COST	EXPECTED RESULTS
	2.9 Develop standards / specifications for appropriate construction of new educational institutions.	NSC, PMU					Little disparity in the technology available in various educational institutions.
	2.10 Develop standards for the design and deployment of furniture and equipment.	NSC					
	2.11 Ensure that suppliers are aware of the specifications developed by the MOEYAS&HRD for the procurement of equipment and furniture.	ICT Desk, PMU	Copies of relevant documentation made available to suppliers	Suppliers confirm receipt of documentation	Mar 05	0.00	
Strategy 3: <i>Facilitate schools in taking ownership of and responsibility for ICT resources at their locations.</i>	3.1 Encourage the formation of school ICT leadership and implementation teams.	ICT Desk, School Principals, Senior Teachers	School ICT Teams formed at all schools	School annual reports, ICT Dept. quarterly reports, ICT annual report	Oct 04	0.00	Effective coordination and management of the ICT deployment process in schools.
	3.2 Provide 2-day training workshop in the development of technology plans to members of the school ICT leadership and implementation teams (2 reps. per school).	ICT Dept, EPU	Training workshops held	Workshop Reports; ICT Dept quarterly reports	Dec 04	8,000.00	ICT Dept. can be relieved to focus more on national projects. School having a sense of ownership of projects and therefore being more committed to their success.
	3.3 Assist schools in preparing ICT Development Plans that are inline with the national plan, and endorse completed plans.	ICT Dept	Visits to schools and online assistance given	Quarterly reports of ICT Dept.	Ongoing	0.00	
	3.4 Monitor the progress of the implementation of the technology plan in each school.	ICT Dept, EPU	Visits to schools and online discussions	Quarterly reports of ICT Dept.	Ongoing	0.00	

STRATEGY	ACTIVITY	BY WHOM	INDICATOR	SOURCE OF VERIFICATION	BY WHEN	COST	EXPECTED RESULTS
Strategy 4: <i>Attract and retain teachers with ICT skills and aptitudes within the education system.</i>	4.1 Liaise with Establishment and Human Resource Departments in sourcing training opportunities for teachers and other educators in various areas of ICT.	ICT Dept., HR Department, Establishment Training Unit	Training opportunities sourced and promoted among teachers/educators	Circulars, brochures received by schools	Ongoing	0.00	A critical mass of teachers who can motivate other teachers in using ICT in their work.
	4.2 Stipulate clearly in Teachers' Job Specifications the minimum requirements in respect to ICT.	CEO, Teachers Unions, State College Faculty of Education, Teacher Education Task Force	Statement by CEO made	Revised Teacher Job Specifications	July 05	0.00	A cadre of experts who can assist in providing ICT training to other teachers, as well as technical support.
Strategy 5: <i>Establish the necessary infrastructure to facilitate the installation of ICT within the education system.</i>	5.1 Develop a phased plan for retrofitting existing institutions to support a technology-enriched working and learning environment., to include furniture and equipment	PMU, ICT Dept., Local Consultant	Plan completed	Plan for the Retrofitting of MOEYAS&HRD's Schools and Offices	Feb 05	5,000.00	A clear articulation of the infrastructural needs of each institution.
	5.2 Conduct an assessment of existing networks within the education system and propose how they can be interlinked.	ICT Dept, TC, Consultant	5.2 – 5.4 Consultancy completed	Plan for the Implementation of an MOEYAS&HRD-wide WAN	Feb 05	30,000.00	Reduction in disparity in the physical plant of various educational institutions.
	5.3 Prepare a detailed design of a cost effective, equitably distributed and secure national network utilizing the most effective available technologies.	ICT Dept, TC, PMU, Consultant					Improvement in physical environment (e.g. security, students' workspace, adequate electrical outlets and network points).
	Prepare a phased plan for installing the network.	ICT Dept, TC, PMU, Regional Consultant					More conducive learning environments (suitable furniture, lighting, etc.). The potential for implementation of an effective WAN.

STRATEGY	ACTIVITY	BY WHOM	INDICATOR	SOURCE OF VERIFICATION	BY WHEN	COST	EXPECTED RESULTS
Strategy 6: <i>Ensure suitability/readiness of school environment/climate for incorporation of ICT's.</i>	6.1 Undertake a comprehensive assessment of the teaching/learning readiness of schools for the introduction of ICTs.	ICT Dept., local consultant	Consultancy completed	Assessment of the Teaching/Learning Readiness of Schools for the Introduction of ICTs. document	May 05	5,000.00	Greater likelihood of appreciation for the presence and potential of ICTs for transforming teaching and learning.
	6.2 Undertake a formal assessment of current teacher competencies in ICT's.	ICT Dept., NSC	Assessment completed	Assessment Report	Apr 05	0.00	Informed planning for teacher training in ICT competencies.
Strategy 7: <i>Provide appropriate training to teachers before they attempt to introduce the use of ICT's in the classroom.</i>	7.1 Provide State College Faculty of Education with specific information on the recommended ICT skills required for entry into the teaching service, as well as for use in the classroom.	CEO, ICT Dept., State College	Recommended skill set communicated to State College Faculty of Education	Recommended Skill Set document	Apr 05	0.00	Teacher graduates minimum ICT skill requirements and are comfortable with the use of ICT in the learning environment.
	7.2 Contribute to the review of the existing teacher training program in re incorporation of ICT's.	CEO, ICT Dept., State College	Incorporation of ICTs included in Review of Teacher Education	Review of Teacher Education document produced by Teacher Education Task Force	Apr 05	0.00	More effective use of technology in teaching and learning.
	7.3 Assist schools in procuring relevant basic educational technologies (hardware and software) and provide training in their utilization.	ICT Desk, NSC	Schools procure basic ICT hardware and software to support their programs; training provided	Basic ICT hardware and software installed at schools; ICT Dept. Quarterly reports	Ongoing	12,000.00	
	7.4 Identify distance education and/or part-time programs for in-service teachers.	ICT Dept., HR Department, Establishment Training Unit	Programs identified and promoted	Quarterly report of ICT Dept.; Promotional material circulated to beneficiaries	Ongoing	0.00	

STRATEGY	ACTIVITY	BY WHOM	INDICATOR	SOURCE OF VERIFICATION	BY WHEN	COST	EXPECTED RESULTS
Strategy 8: <i>Provide training for principals of schools in management of technology, and ICT as a managerial tool.</i>	8.1 Review of competencies of school principals and administrative staff in ICT management and use of ICTs for management.	ICT Dept., Principals, DEOs	Review completed	Review document	Apr 05	0.00	Informed, data-driven decision-making. Availability of online data that can be used for research purposes.
	8.2 Source training opportunities in ICT management and use for principals and administrative staff.	HR Department, ICT Dept., Establishment Training Unit	Training opportunities identified and promoted	Quarterly report of ICT Dept. Promotional material circulated to beneficiaries	Ongoing	0.00	Enhancement in the quality of work being produced. Increase in the efficiency of performing routine administrative functions.
Strategy 9: <i>Provide opportunities/support for higher level training for educators in advanced areas of ICT.</i>	9.1 Compile a database/inventory of ICT competencies among MOEYAS&HRD staff including school personnel and Committee members.	ICT Dept., NSC	Database compiled and regularly updated	Database on assigned computer(s)	Dec 04	0.00	Higher-level educators are trained and competent at ICT and its management. Better informed leadership and decision-making at upper levels of education management.
	9.2 Identify personnel with aptitude/desire to pursue higher level training in ICT.	ICT Dept., NSC	Personnel identified and categorized	Database on assigned computer(s)	Ongoing	0.00	
	9.3 Seek opportunities and/or support for higher level ICT training for selected personnel particularly in key areas of need.	ICT Dept., HR Department, Establishment Training Unit	Training opportunities identified and promoted	Quarterly report of ICT Dept.; Promotional material circulated to beneficiaries	Ongoing	0.00	
Strategy 10: <i>Facilitate equitable access to ICT for all students.</i>	10.1 Establish targets for student and community access to ICT.	ICT Dept., NSC	Targets established	Quarterly report of ICT Dept., Targets document	Feb 05	0.00	Expansion of access to ICT by students Access to ICT after school hours

STRATEGY	ACTIVITY	BY WHOM	INDICATOR	SOURCE OF VERIFICATION	BY WHEN	COST	EXPECTED RESULTS
	10.2 Enhance ICT environment at five primary schools.	ICT Dept., PMU, Electrical Dept.	ICT environment enhanced at 5 schools	ICT environment at schools	Jul 05	30,000.00	students with no computers at home and the community.
Strategy 11: <i>Implement configuration(s) that is (are) optimal for teaching/learning with ICT's</i>	11.1 Research the use and efficacy of various ICT configurations from documentation and/or the experience of others.	ICT Dept., NSC, PMU	Research completed and documented	Research document	Feb 05	0.00	Increase in feasibility in incorporating the use of computers in lessons. Optimal computer access for students and teachers.
Strategy 12: <i>Integrate ICT's into the curriculum.</i>	12.1 Create guidelines on how ICT skills can be incorporated at various levels and in various subject areas.	ICT Dept., NSC, CRC, SC	Guidelines completed and submitted	Guidelines document	Mar 05	600.00	The development and implementation of programs and practices that produce positive results.
	12.2 Examine critically the existing curriculum with the view to including ICT's as an additional teaching/learning mechanism.	ICT Dept., NSC, CRC, SC, Curriculum Unit	Summary report completed and submitted	Summary Report	Jun 05	600.00	The introduction of promising techniques that are enabled by ICT.
	12.3 Prepare a two-tiered Basic ICT Skills Set using existing documentation and teacher experiences to two levels – Level I (by end of Primary) and Level II (by end of Lower Secondary (Form III)).	ICT Dept., NSC, CRC, Curriculum Unit	Basic Skill Set completed	Basic Skills Set document	May 05	600.00	Secondary school graduates with certified ICT competencies. Less likelihood of disparity in students' performance from one school to the next.
	12.4 Prepare a teacher orientation package on integration of ICT's in the teaching/learning process, to include ideas for all subject areas.	ICT Dept., NSC, CRC, Curriculum Unit	Teacher orientation package completed	Teacher Orientation Package	May 05	600.00	Significantly less time being spent by teachers in devising creative strategies to cover a given topic. Students who graduate from the school system with higher order skills and competencies.

STRATEGY	ACTIVITY	BY WHOM	INDICATOR	SOURCE OF VERIFICATION	BY WHEN	COST	EXPECTED RESULTS
	12.5 Assist/advise schools in expanding opportunities for CXC or other certification levels as an option for students of Upper Secondary Level.	NSC, Principals of Secondary schools. ICT Dept.	More students at more schools able to choose ICT as a CXC option	Student CXC options offered at secondary schools	Ongoing	0.00	Students who are able to function in complicated, dynamic and ambiguous situations.
	12.6 Encourage attendance and participation of students, teachers and educators at the national ICT Conference.	ICT Dept., NSC, Principals, Teachers	Students, teachers and educators attend the National ICT in Education Conference	Student enrolment in CXC level ICT courses Participants lists for ICT in Education Conference	Jan 05	10,000.00	More student-paced learning. Better monitoring of individual student's progress.
	12.7 Encourage and support participation of students in the annual National Math, Science and Technology Fair to showcase the work and accomplishments of teachers and students in ICT.	ICT Dept., NSC, Principals, Teachers, Curriculum Unit	Students participate in the annual National Math, Science and Technology Fair	Entry and participants lists of National Math, Science and Technology Fair	Jan 05	0.00	Increase in students' engagement and motivation (including those who are at the extreme ends of the learning ability spectrum).
	12.8 Provide access for students and teachers to international knowledge networks and shared educational resources.	ICT Dept., NSC, Principals, Teachers, Students	Students and teachers participate in international knowledge networks	Reports from schools; ICT Dept. quarterly reports	Ongoing	0.00	
	12.9 Provide opportunities for teachers to share experiences (lessons learnt and best practices) in relevant meetings and fora.	ICT Dept., NSC, Principals, Teachers, Students	Teachers participate in relevant discussions/for a on ICT in Education	ICT Dept. quarterly reports School reports	Ongoing	600.00	
Strategy 13: <i>Acquire and implement various easily integrated information systems.</i>	13.1 Pilot single-site <i>SmartSchools</i> EMIS program at five secondary schools.	ICT Dept., NSC, Principals, Teachers, Curriculum Unit, SC	<i>SmartSchools</i> EMIS program piloted at five secondary schools.	Mid-term Report on pilot	Jan 05	0.00	First-hand EMIS experience for pilot schools. Other schools benefit from pilot report..

STRATEGY	ACTIVITY	BY WHOM	INDICATOR	SOURCE OF VERIFICATION	BY WHEN	COST	EXPECTED RESULTS
Strategy 14: <i>Facilitate funding mechanisms for ICT implementation.</i>	14.1 Include budget for Year II Action Plan in the Ministry's Corporate Plan for 2005-2006.	ICT Dept., EPU	Year II Action Plan featured in 2005-2006 Corporate Plan	MOEYAS&HRD's 2005-2006 Corporate Plan	Feb 05	TBD	More funds available for (a) increasing the availability of technology; (b) upgrading ICT capacity/skills of teaching and administrative staff; and (c) enhancing learning environment (d) Maintaining the ICT program. Increase in the likelihood of success of various projects in which assistance such as the professional expertise of experienced individuals is utilised. Improvement in the quality of human resource in ICT. Strengthening of bonds between education and community. Increase in community involvement in education. Availability of more resources.
	14.2 Seek external funding and other forms of assistance from various organisations for ICT related activities.	ICT Dept., EPU, PMU	Information on assistance sources sought and accessed	Information documents; Assistance Requests; Quarterly reports	Ongoing	0.00	
	14.3 Facilitate attendance at meetings and conferences at which personalized contact can be made with key personnel from potential funding agencies / sponsors.	ICT Dept., EPU, PS Education, CEO	Relevant meetings attended	Reports on Meetings	Ongoing	5,000.00	
	14.4 Facilitate the establishment of and/or participation in networks through which contacts can be made with key personnel from funding agencies.	ICT Dept., EPU, PS Education, CEO	Participation in relevant networks	Reports of participation in Networks ICT Dept Quarterly reports	Ongoing	0.00	
	14.5 Provide funding for new and already established partnership programs with local and international partners for funding at school or national levels (Palliser Project).	ICT Dept., EPU, PS Education, CEO	Funding reflected in 2004-2005 Budget	2004-2005 MOEYAS&HRD budget	Feb 05	30,000.00	
	14.6 Encourage fund raising activities at school and national levels.	ICT Dept., EPU, CEO			ongoing	0.00	

STRATEGY	ACTIVITY	BY WHOM	INDICATOR	SOURCE OF VERIFICATION	BY WHEN	COST	EXPECTED RESULTS
Strategy 15: <i>Foster constructive partnerships with private sector and NGO organizations for ICT development.</i>	15.1 Establish and strengthen private sector / NGO partnership programmes for sharing of hardware, software, materials and training for ICT activities (e.g. Cable & Wireless)	ICT Dept., NSC, SC, TC	Partnership TORs completed and implemented	Partnership TOR document	Ongoing	0.00	Reduction in the budget required for areas such as professional development, and research and development, etc.
	15.2 Formalize and strengthen international partnerships with organizations/friendly governments willing to provide ICT equipment, material, research and training (e.g. Palliser, DOMLEC, Alliance Francaise)..	ICT Dept., PS Education, CEO, LEC	Partnerships formalized	Signed Partnership Accords	Dec 04 and ongoing	0.00	Savings realised as a result of various forms of contributions made by the community, business, associations and individuals e.g. free labour, materials and ideas. Community/private participation in the financing of education.
	15.3 Host public relations programmes to highlight the benefits of ICT in education and the various ways in which the community, business, professional associations and individuals can help.	ICT Dept., CEO,	Public relations events hosted	Reports on Events; Quarterly Reports of ICT Dept.	Ongoing	0.00	
	15.4 Utilize the expertise of international overseas volunteer programs for necessary ICT-related technical and training expertise (JOVC, Peace Corps).	ICT Dept., EPU, NSC, TC, CRC, SC, DTT	Assistance given by volunteers	Quarterly reports of ICT Dept, Volunteer reports	Ongoing	0.00	

STRATEGY	ACTIVITY	BY WHOM	INDICATOR	SOURCE OF VERIFICATION	BY WHEN	COST	EXPECTED RESULTS
Strategy 16: <i>Adopt a prudent approach in the procurement and management of ICT hardware and software.</i>	16.1 Develop a database of vendors/suppliers of ICT-related merchandise.	ICT Dept., PMU, NSC	Vendor Database completed and regularly updated	Vendor Database on assigned computer(s)	Dec 04 and ongoing	0.00	A higher level of integrity being displayed by suppliers.
	16.2 Establish a protocol for procurement of ICT merchandise.	ICT Dept., PMU, NSC	Protocol established	ICT Procurement Protocol document	Dec 04	0.00	Greater satisfaction with the goods and services received by the MOE, schools, etc.
	16.3 Explore a variety of options for acquisition of ICT equipment e.g. leasing as opposed to buying.	ICT Dept., PMU, NSC	Decisions on options taken	Report on ICT Acquisition Options; ICT Annual Review	Jan 05 Mar 05	0.00 0.00	Improved support and services from suppliers
	16.4 Develop a strategy for the standardization of ICT equipment throughout the island	ICT Dept., PMU, TC, SC, NSC	Strategy developed	Strategy for standardization of ICT Equipment document	May 05	0.00	
Strategy 17: <i>Ensure an effective maintenance and technical support mechanism.</i>	17.1 Provide basic initial training to users to ensure ICT resources are protected from end-user misuse.	School ICT Teams, ICT Dept.	Training sessions executed	School Reports, quarterly reports of ICT Dept.	Ongoing	0.00	Increase in longevity of equipment and sustainability of the programme.
	17.2 Identify and train individuals at 30 schools and offices to perform basic troubleshooting and minor repairs at 2 one-week workshops.	ICT Dept., Principals, Teachers	Two training workshops held	Workshop reports from ICT Dept., quarterly report of ICT Dept.	June 05	7,500.00	Decrease in the need and the cost associated with the replacement of computer equipment and components.
	17.3 Perform preventive and predictive maintenance at regularly scheduled intervals.	School technicians, ICT Dept..	Maintenance done according to schedule	School maintenance logs, technicians' reports	Ongoing	0.00	Decrease in the need to contract the services of external technicians and in the cost associated with doing so.
	17.4 Establish a protocol for internal servicing and referring ICT hardware for outsourced servicing.	ICT Dept., TC, school technicians	Protocol established and published	School ICT Servicing and Referral document	Dec 04	0.00	Reduction in interruptions in the work of computer users, and consequently in the loss of productivity due to

STRATEGY	ACTIVITY	BY WHOM	INDICATOR	SOURCE OF VERIFICATION	BY WHEN	COST	EXPECTED RESULTS
	17.5 Provide a budgetary allocation for in-house servicing and refurbishment of ICT equipment	ICT Dept., EPU, CEO, Min. of Finance	Allocation made on annual budget	Budget Head on ICT Dept. Budget	Mar 04	20,000.00	downtime of equipment. More efficient resolution of technical problems.
	17.6 Explore the possibility of a maintenance management system to track, schedule and cost maintenance of ICT equipment.	ICT Dept., TC School technicians, ICT Dept., TC	Report and recommendations completed and submitted.	Recommendations for an ICT Maintenance Management System document	Feb 05	0.00	Greater willingness to adopt the technology due to confidence of individuals. Readily accessible database of reputable service providers
	17.7 Compile a list of reputable technical service providers who can serve schools in their communities.		List completed and regularly updated	Service Personnel Reference List	Dec 04 & ongoing		
Strategy 18: <i>Encourage the local generation of revenue to maintain ICT equipment.</i>	18.1 Encourage schools to utilize ICT resources in creative ways to generate funds.	ICT Dept, CEO, NSC	Fund-raising plan included in schools' year plan and SDP	Schools' year plan and SDP documents	Sept 04	0.00	Timely and accurate reporting on ICT revenue generation Greater accountability of schools
	18.2 Undertake community awareness programs on the benefits of ICT competencies and to encourage the use of school ICT facilities for a minimal fee.	ICT Dept, NSC, MOEYAS&HRD radio program, DEOs, Principals, PTAs	Awareness programs executed	ICT Dept quarterly reports; schools' annual reports; MOEYAS&HRD radio program reports	Ongoing	0.00	
	18.3 Establish non-discriminatory cost recovery mechanisms for public access to computers installed in schools.	ICT Dept, NSC, Principals, PTAs, DEOs	Cost recovery plan completed	Cost Recovery Recommendations Document	Dec 04	0.00	
	18.4 Require that schools report accurately all revenue generated from community access programs.	CEO, DEOs, Principals, PTAs	Timely and accurate reporting on community access programs done .	Schools audited annual reports	July 05	0.00	

STRATEGY	ACTIVITY	BY WHOM	INDICATOR	SOURCE OF VERIFICATION	BY WHEN	COST	EXPECTED RESULTS
Strategy 19: <i>Encourage and support research on and evaluation of the impact of ICT in the education system.</i>	19.1 Provide opportunities for participation in workshops, training programmes, and relevant forums on issues pertinent to ICT in education.	ICT Dept., CEO, EPU	Teachers participate in relevant activities.	Reports from Teachers/ICT Dept	Ongoing	2,000.00	A bank of current information on recent developments and innovations in ICT. Better-informed decision-making.
	19.2 Regularly investigate the most commonly used ICT tools currently on the market.	ICT Dept., NSC, Teachers	Findings reflected in ICT Dept quarterly report	Quarterly report of ICT Dept	Ongoing	0.00	
	19.3 Facilitate local access to regional and international research findings.	ICT Dept., NSC, Teachers	Findings reflected in ICT Dept quarterly report	Quarterly report of ICT Dept	Ongoing	0.00	
Strategy 20: <i>Perform an annual review of ICT initiatives.</i>	20.1 Provide Terms of Reference and reporting mechanisms for an annual review.	CEO, ICT Dept., NSC	TORs submitted to CEO	TOR Document	Jan. 05	0.00	Active summary of ICT activities to date; Timely, incisive recommendations made for next budget year
	20.2 Undertake an annual ministry-wide review of ICT and ICT related issues.	ICT Dept	Review completed	Review Report	Mar. 05	0.00	

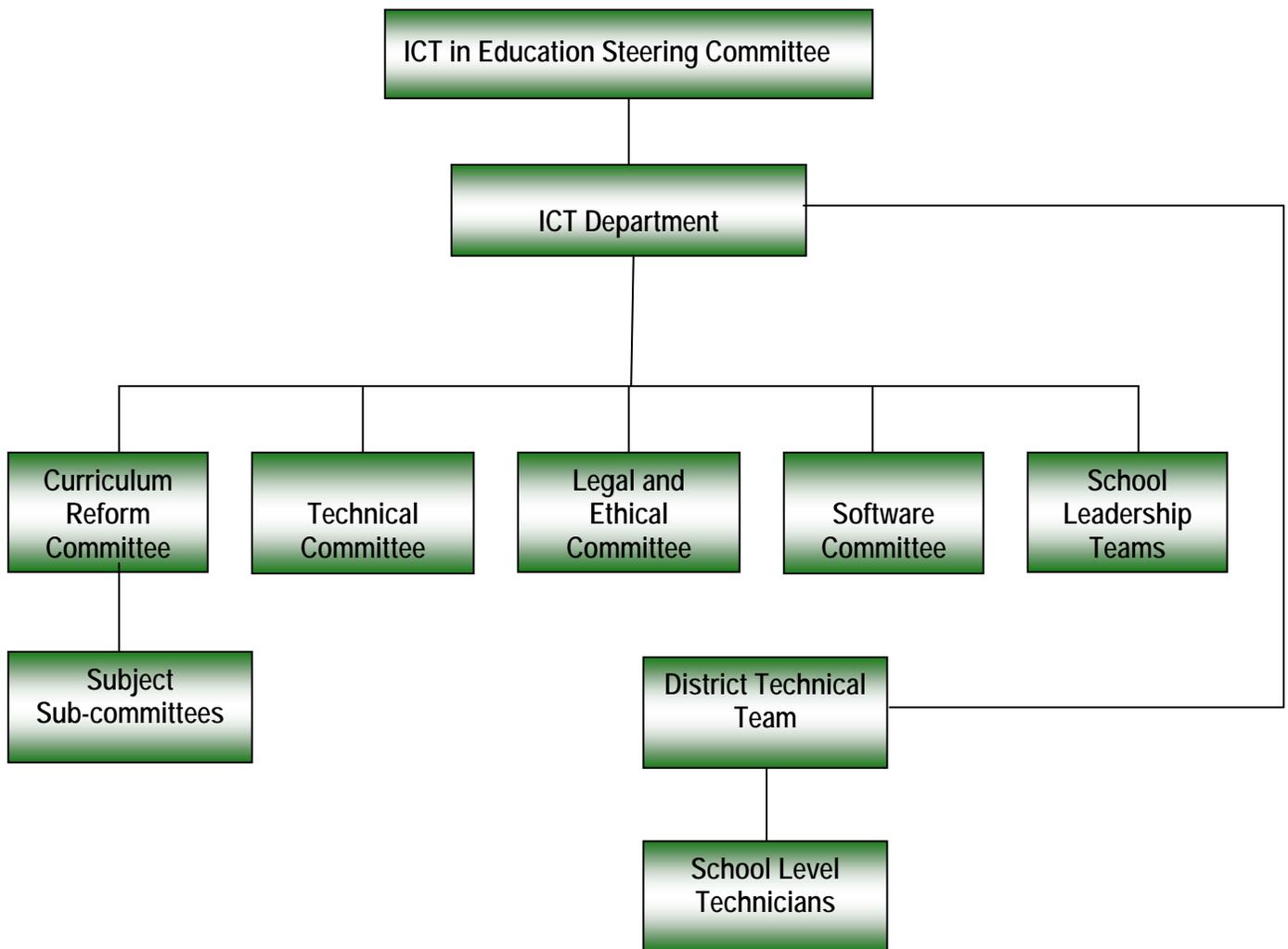
10.0 REFERENCES

- Alberta Learning (2001). **Investigating the Total Cost of Technology in Schools – Tools and Strategies for Managing Technology Investments**. Alberta Learning.
- Alliance for Childhood (August 25, 2001). **Fool's Gold: A Critical Look at Computers and Childhood**. http://www.allianceforchildhood.net/projects/computers/computers_reports.htm.
- Boyce, Stephen L. (2002). **ICT Learning Outcomes in Mathematics and Language Arts for Lower Secondary School Students in the Eastern Caribbean**, OERU, Castries.
- Boyce, Stephen L. (2003). **ICT Learning Outcomes in Mathematics and Language Arts for Lower Secondary School Students in the Eastern Caribbean – Teachers Guide**, OERU, Castries.
- Brabant, J., Buller, E., and Farrell, J. (1998). **Science and Technology and the World of Work – Design Mission Report**. ECERP.
- Castro, Claudio de Moura (September/October, 1999). **Computers in Schools: 10 Points to Avoid Past Errors**, TechKnowLogia, www.TechKnowLogia.org
- Cawthera, Andy (??). **Computers in Secondary Schools in Developing Countries: An Analysis of Costs**. DFID/WorLD www.world-links.org
- Council of Regional Organisations of the Pacific (CROP) ICT Working Group (April 2002). **Draft Pacific Islands Regional Information and Communication Technologies Strategic Plan**. <http://www.undp.org/fj/documents/ICT4DEV/Pacific%20ICT%20policystrategy.pdf>
- Eadie, Gillian M (2001). **The Impact of ICT on Schools: Classroom Design and Curriculum Delivery**.
- Education Planning Unit (July 2001). **Education Development Plan 2000-2005 and Beyond – World Class Education for the 21st Century**. Ministry of Education, Sports and Youth Affairs, Dominica.
- Edwards, David (1999). **Infusing Information Technology into the Education Reform Process**. Project Management Unit, Ministry of Education Sports and Youth Affairs - Dominica, Roseau.
- Graduate Students at Mississippi State University (1996). **Guidebook for Developing an Effective Instructional Technology Plan version 2.0**, <http://www2.msstate.edu/~lsa1/nctp/Guidebook.pdf>
- Haddad, Wadi d., and Draxler, A. (Eds.) (2002) **Technologies for Education – Potentials, Parameters and Prospects** UNESCO/AED: Paris/Washington DC.
- Holmes, B. Henderson, (2000). **Situation Analysis on the Information Technology Sub-Sector and Matters Related Thereto In the Commonwealth of Dominica**. Prepared for the National Development Corporation of Dominica.
- Law N.W.Y. and Lee Y. (2000). **Emerging Pedagogical Practices: Hong Kong in an International Context**. *Changing Classrooms & Changing Schools. A Study of Good Practices in Hong Kong Schools.*, CITE – The University of Hong Kong, Hong Kong.

- Ministry of Education, Commonwealth of Dominica. (2003). **Policy Document on Information and Communications Technology for use in the Education System of the Commonwealth of Dominica**. Education Planning Unit, Roseau.
- Ministry of Education, Denmark (1998). **Information and Technologies in the Education System: Action Plan for 1998-2003**, <http://uvm.dk/pub/1998/ICTstrat/1.htm>.
- Ministry of Education, New Zealand (2001). **Information and Communication Technology Strategy for Schools**, <http://www.tki.org.nz/ict/htmls/st/launch/doceng.pdf>.
- Ministry of Education, Youth Affairs and Sports, Barbados (2002-2003). **EduTECH – The Learning Revolution**. <http://www.edutech2000.gov.bb/>
- Moses, Kurt (2000). **Information Systems for Education Management**. TechKnowLogia, May/June, 2000. Knowledge Enterprise, Inc. www.TechKnowLogia.org
- North Somerset Council (??). **Education Directorate Information Communications Technology Strategic Development Plan 2003 – 2006**.
- OECS Education Reform Unit, (June 2001). **Model ICT Policy Document for the Education System**. OERU, Castries.
- OERU (1991). **OECS EDUCATION REFORM STRATEGY - Summary, Strategies and Recommendations Foundation for the Future**, OERU.
- OERU (2000). **Pillars for Partnership and Progress**. OERU, Castries.
- Plummer, M. and Ernest, M (2003). **Draft Strategies for Implementing ICT Policies in the Education Systems of the OECS**. OECS Education Reform Unit, Castries.
- Proenza, Francisco J., (2002). **e-ForAll: A Poverty Reduction Strategy for the Information Age**. FAO
- Sunday Ojo (Ph D), 2000, **Information and Communication Technologies (ICTs) Human Resource Capacity Development Strategies for Islands and Small States in a Holistic Perspective**, Department of Computer Science, University of Botswana.
- Tha, Sok (2003). **e-Learning in Cambodia – Perspectives, Strategies and Next Steps**. AEN Conference, Tokyo.
- UNESCO Institute For Information Technologies In Education (2002) **Medium–Term Strategy 2002–2007**. IITE.
- West, Arnott (2002). **EMIS Requirements Draft Preliminary /report: Extended EMIS for the OECS**. OERU.
- World Bank (??). **Educational Change in Lation America and the Caribbean**. The World Bank.

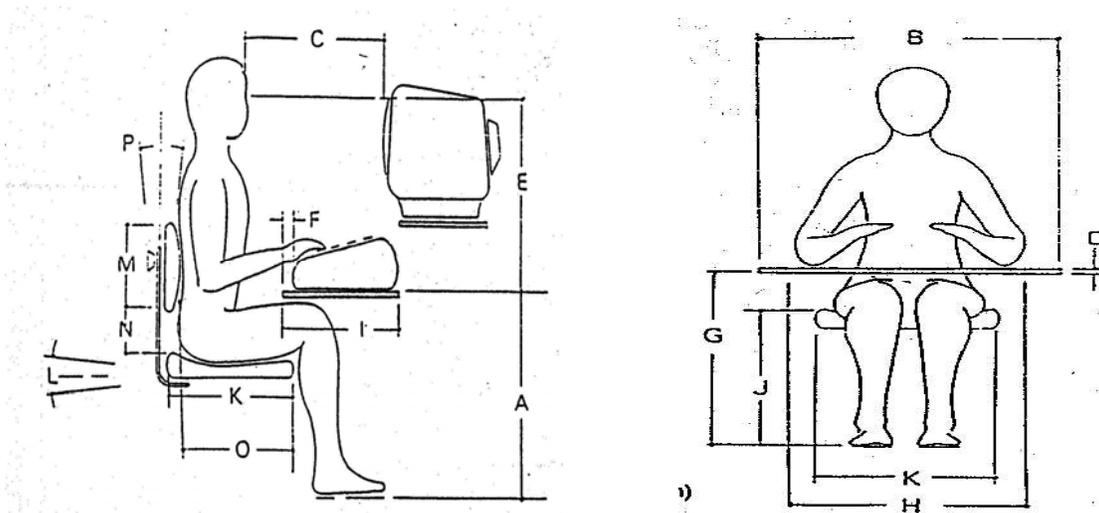
APPENDIX I

SUGGESTED ORGANISATION STRUCTURE FOR PLANNING AND MANAGEMENT OF ICT IN EDUCATION



APPENDIX II

RECOMMENDED SPECIFICATIONS FOR COMPUTER WORKSTATIONS¹⁴



- *A - Height of work surface:* adjustable 23 to 28 inches (584 to 711 mm).
- *B - Width of work surface:* 30 inches (760 mm).
- *C - Viewing distance:* minimum 12 Inches (305 mm); hard copy distance 12 to 16 inches (305 to 406 mm); typical eye to keyboard distance 18 to 20 inches (457 to 508 mm).
- *D - Thickness of work surface:* 1 inch (25 mm).
- *E - Height of screen:* Top of screen at approximately eye level (maximum 0 deg. to horizontal, or 0 deg. to - 60 deg.).
- *F - Palm rest:* 11/2 inches (40 mm).
- *G - Knee room height:* minimum of 26.2 inches (665 mm) non-adjustable surface.
20.2 inches (513 mm) adjustable surface.
- *H - Knee room width:* 20 inches (510 mm) minimum.
- *I - Knee room depth:* minimum of 15.0 inches (381 mm) knee level; 23.5 inches (597 mm) toe level.
- *J - Seat height:* adjustable 16 to 20.5 Inches (400 to 521 mm).
- *K - Seat size:* 15 to 17 Inches (381 to 432 mm) depth, 17.7 Inches (450 mm) width, "waterfall" front edge.
- *L - Seat slope:* adjustable 0 deg. to 10 deg. backward slope.
- *M - Backrest size:* 7 Inches high (180 mm), 13 Inches wide (330 mm).
- *N - Backrest height:* adjustable 3 to 6 Inches (80 to 150 mm) above seat.
- *O - Backrest depth:* adjustable 14 to 17 Inches (350 to 430 mm).
- *P - Backrest tilt:* adjustable \pm 15 deg.
- *Other - Angles between back rest and seat* 90 deg. to 105 deg.; between seat and lower leg 60 deg. to 100 deg.; between upper arm and forearm 70 deg. to 135 deg.

¹⁴ Source (TBD)

APPENDIX III

REGULATORY STATEMENTS

(I) Software Acquisition, Use, Installation and Distribution Procedures

1. All requests for software and software upgrades shall be submitted to the School's Principal, where possible.
2. All software and software upgrades not procured by the Principal shall be documented and reported to the Principal, who will verify that the School has an appropriate license for the use of such bundled software.
3. All software acquisitions that are bundled with hardware shall be documented and identified to the Principal, who will verify that the School has an appropriate license for the use of such bundled software.
4. The Principal shall store in a secure, central location all original software licenses, diskettes, CD-ROMs, and documentation upon receipt of all new software.
5. No staff member shall install software on the School's computers without being authorized to do so by the Principal.
6. No staff member or students shall install, use or distribute software for which the School lacks appropriate license.
7. No staff member shall install any software upgrade on a computer that does not already have resident on it the original version of the software.
8. The Principal or designated staff member shall destroy all copies of software that are obsolete or for which the school lacks the appropriate license. Alternatively the Principal may obtain the license(s) necessary to maintain such software on the School's computers.
9. The School shall conduct an inventory and review of all its hardware and installed software on a periodic (at least annually) and random basis.
10. The School shall establish and maintain a record keeping system (preferably computerized) for software licenses, hardware, original CD-ROMs and diskettes, user information and assessment information.
11. No staff member may use or distribute personally owned software (excluding freeware and sharewares) on the School's computers or networks.
12. All software to be used in schools must first be evaluated by the software Evaluation Team.

(II) Acceptable Use of On-Line Information Resources Guidelines

1. All use of school Local Area Networks (LANs) and Wide Area Networks (WANs) including access to the Internet must be consistent with the educational mandate of the School.
2. Any use of the Internet by students and teachers for commercial purposes, without authorization by the Principal, is prohibited.
3. Network accounts are to be used only by the authorized owner of the account. The sharing of passwords is prohibited.
4. All network/Internet users shall not seek information on obtaining copies or modified files, data or passwords belonging to other users, or misrepresent other users on the network/Internet.
5. All information accessible on the Internet shall be assumed to be private property. All copyright issues regarding software information and copyrights must be respected. The unauthorized copying or transferring of copyrighted materials may result in a loss of network privileges.
6. Malicious use of the network to develop programs that harass other users; infiltrate a computer or computer system and/or damage the software components of the computer or computer system (locally or on the Internet) is prohibited.
7. Fraudulent, harassing, offensive or obscene messages or materials and other anti-social behaviours are prohibited on the network/Internet. All users of the school network shall use language appropriate for school situations.
8. All programmes and files brought on the premises (downloaded or otherwise) must be examined for viruses before being used on any computer.
9. The access or downloading of inappropriate materials or files unsafe to the integrity of the Local Area Network is forbidden.
10. No student addresses, phone numbers or individual photographs linked to student names may be published under any circumstances.

APPENDIX IV

THE OECS EDUCATION REFORM STRATEGY: 2010¹⁵ OECS Education Reform Unit, Castries St. Lucia, 2000

STRATEGIES FOR INFORMATION AND COMMUNICATIONS TECHNOLOGY

Objectives

- ✚ To foster, facilitate, enhance and build functional collaboration, cooperation and the pooling of resources among students, teachers, managers and administration in education through the use of Intranets and the Internet.
- ✚ To improve and modernize teaching and learning through the use of information and communications technology applied to the teaching and learning processes in schools.
- ✚ To ensure that all students leaving a school system at the end of at least nine years of schooling are computer literate and can effectively use information and communications technology applied to the activities of daily life.
- ✚ To improve, modernize and make more efficient the management of schools and Ministries of Education through education management information systems that are networked and linked dynamically.
- ✚ To expand the pool and improve the quality of persons in the OECS who can be educated and trained as information and communications technology specialists.

General Philosophy

Information and communications technology has become ubiquitous in its applications to modern life. It is a tool of work, learning, entertainment, communication and management. As important is the fact that it has become a symbol of modernization and progress. For people living, learning and working on islands but who wish to share a common destiny, information and communication technology becomes a virtual bridge across the expanse of sea that separates islands from each other.

Information and communications technology applied to education reform in the OECS, therefore, does not only represent a skills of skills to be acquired for its effective use, but more importantly as tools of learning, teaching and management as well as a symbol of modernization and progress, and most critically as a virtual bridge linking students in schools and colleges, managers and administrators in institutions and Ministers within and across islands. Taken together information and communications technology skills can be effectively applied to modernize and enhance teaching, learning and management, mobilize new support for education and provide the infrastructure for regional collaboration, cooperation

¹⁵ OERU (2000). *Pillars for Partnership and Progress*. OERU, Castries.

and the pooling of resources to unprecedented levels. The impact of the latter is likely to be a great sense of sub-regional identity and solidarity than could be achieved by any other means.

The revolution that has taken place in information and communications technology is ushering in the knowledge society. Wealth creation is now predicated on knowledge and technological competence matched with creativity and perspicacity. Schools and colleges are about knowledge – generation, dissemination and acquisition. Schools and colleges are, therefore, seen as focal points in the knowledge network centerpiece of community access that can interface with the information and communications technology infrastructure. As information and communication resources are established in schools and colleges, they must serve the wider communities in which they are located with respect to access and training in their use. In this regard, the sharp boundaries of in school and out-of-school will be blurred and rendered ambiguous in meaning.

Reform Strategies

Strategy 13:

Establish an intranet in each of the nine OECS countries linking schools and colleges with Ministries of Education using appropriate technology – whether cable or microwave or some combination of both – and link the country intranets to create an OECS Education Intranet. The country and sub-region intranets must be designed and structured to permit the transmission of voice, video and data seven days per week, twenty-four hours per day.

Developments taking place in wireless and other technologies and the proximity of the islands that constitute the OECS make it distinctly possible and feasible to establish a dedicated intranet linking all schools, colleges and ministries in the sub-region on a twenty-four hour, seven days per week basis. A great advantage of a wireless intranet, using microwave technology, is that it requires no monthly connection charges and, therefore, limits recurrent costs for the maintenance that is mandatory for any system. The point here is not to prefer wireless technology to every other and to make it the technology choice but rather to highlight those features that are of great relevance to the financial circumstances faced by education systems. Should other technologies offer the same financial advantages, then they should also be considered and applied where appropriate.

The great virtue of creating an infrastructure connecting educational institutions in the sub-region is that it has the potential to inspire individual institutions to mobilise resources to acquire most of the equipment needed to make maximum use of its potential. Indeed, some of these resources could come from more costly and less efficient and effective means of communication and contact that are currently employed.

Strategy 14:

Establish and promote a cost sharing partnership framework for mobilizing resources to modernize school plants with Information Communications Technologies.

This framework should be premised on matching contributions of at least equal amounts, from Government, the private sector and the school community in equipping schools and colleges with the Information Communications Technologies (ICT) and educational technology needed to modernize and improve learning, teaching and management and to connect to the OECS Intranet. Where schools have already mobilized resources on their own and acquired equipment, such efforts should be counted in their contribution in receiving

matching funds from Government and the private sector. Guidelines would need to be developed with respect to gifts of hardware and software donated to schools and colleges. These guidelines should address issues of compatibility, obsolescence, maintenance, training and technical support.

Strategy 15:

Create guidelines whereby communities, on a cost recovery basis, can utilize the schools ICT resources for the purpose of accessing the Internet, e-mail, fax services and on-line courses and for schools and colleges providing desktop publishing and other services for the communities in which they are located.

From the resources acquired through community access and services, schools and colleges should both maintain and upgrade their ICT capabilities. Such an arrangement should ensure the sustainability of the ICT infrastructure of schools and colleges.

Strategy 16:

Put in place, on a project basis for five years on a country basis, in partnership with the private sector and tertiary institutions:

a) Training and technical support resources for teachers and managers in schools and colleges who engage in applying information and communications technology to enhance learning and management and also for technicians in schools or the private sector, whose responsibility it will be to maintain the ICT systems.

b) A university-moderated certificate course on Integrating Information and Communications Technology in the Curriculum. By 2005, at least ten percent of teachers in every school and college should have pursued such a university-moderated certificate course. By 2010, at least fifty per cent of teachers should have pursued such a university-moderated course.

While initially teachers and managers will require training and technical support in shifting from paper-based systems of management and conventional modes of learning and teaching, over a five year period schools and colleges should develop sufficient expertise in ICT applied to management and learning to be able to sustain themselves thereafter. Without training and technical support, however, teachers and managers will take a much longer time to achieve proficient and effective use of ICT and are likely to maintain the old ways of operating. Without proper maintenance of hardware and applications in order to ensure the reliability of the ICT systems, teachers and managers are unlikely to have confidence in the ICT infrastructure and, therefore, are unlikely to invest substantial time and talent in effecting the desired improvements and enhancements.

Strategy 17:

Through a system of incentives, encourage teachers, managers and students to develop software, applications and databases designed to enhance, develop and conserve Caribbean culture and knowledge and in areas in which the imported applications are inappropriate or not affordable.

While Caribbean countries (including OECS) are currently importers and consumers of ICT, the region and sub-region must develop the capacity to be designers and producers of information and communication products. Persons with talent and inspiration must be encouraged to embark upon this path.

Strategy 18:

Encourage and support schools, colleges, educational organizations and associations within the OECS to establish virtual learning and cooperative communities through making use of the OECS Intranet. In the first instance, particular encouragement and priority should be given to associations, organizations and administrative units that currently operate functional face-to-face networks across the sub-region to add a virtual capacity to their operations. At the school level, students and teachers should be encouraged and given special recognition for establishing virtual communities with colleagues and peers in other countries within the OECS and the wider Caribbean.

Strategy 19:

Establish an evaluative mechanism to ensure that by 2010:

- ✚ All students receiving nine years of schooling – six years of primary and three years of secondary – are computer literate and can use ICT as it is applied to everyday activities in homes, schools, entertainment and communications.
- ✚ All students entering tertiary institutions are proficient users of ICT at the time of entry to those institutions.
- ✚ All students entering the world of work after completing secondary schooling are proficient users of ICT.
- ✚ Each school system within the sub-region is producing students who have special aptitudes and talents in ICT and who have begun to specialize in this area, sufficient to meet the demands for the ICT industry in that country.

APPENDIX V

EDUCATION PLANNING UNIT
MINISTRY OF EDUCATION, YOUTH AFFAIRS AND SPORTS
Education, Science and Technology Building
Cornwall St. Roseau
Tel 1 767 448 8686 / 2401 x 3060/3061/3263 Fax 1 767 448 1701

RECOMMENDED MINIMUM SPECIFICATIONS FOR REFURBISHED COMPUTER EQUIPMENT TO BE INSTALLED AT SCHOOLS

SYSTEM UNIT

Processor (CPU): 266 MHz
Memory (RAM): 64 MB
Hard Drive (HDD): 6 GB
Floppy Drive (FDD): 3.5"
CD Drive (CD-ROM): 24x
Network Card (NIC): 10/100
Operating System: WIN98
CMOS Utility (BIOS): 1996

MONITOR

15" interlaced
15-pin connector
100-240V input

PRINTER

Inkjet/Deskjet/Laser
Standard parallel (or USB) connector
Less than 2 years regular usage

OTHER

Modem 56K
Hub/Switch RJ45 ports, 100-240V (switchable power supply)
Audio with headphones (NOT speakers)

.....
ABRAHAM J. DURAND
COORDINATOR TECH/VOC/ICT
December 2003

APPENDIX VI

GUIDELINES FOR INSTALLING COMPUTER EQUIPMENT AT SCHOOLS AND OFFICES OF THE MINISTRY OF EDUCATION IN THE COMMONWEALTH OF DOMINICA

The ICT Desk at the Ministry of Education continues to be highly concerned about the continuing deployment of computers in schools and offices on the island without the necessary infrastructural preparation and requirements that would ensure the productivity and longevity of the equipment. It is very well known that we have been experiencing a high failure rate with computer and other electronic equipment at our offices and schools, and a correspondingly high rate of maintenance costs and abandonment of equipment. In light of the above, the ICT Desk very strongly recommends the following measures.

A. PLANNING and ADMINISTRATION

The effective administration and supervision of computer rooms and equipment is an extremely significant factor in the successful implementation of an ICT program at a school. ICT is no longer an exclusive venture, tenable only by a privileged few "computer experts" – ICT is now a way of life, and therefore requires the active participation of all stakeholders. Schools need to provide opportunity for as many staff as possible to participate in the administration and supervision of ICT, to develop the human resource as well as ensure successful implementation and continuity of the program.

1. Each school should set up an *ICT Cabinet* comprising persons skilled in the following areas:
 - a. Technical knowledge/skills/aptitudes
 - b. Software capability
 - c. Leadership in using ICT in teaching/learning
 - d. Management/administration
2. Each school should develop a Technology Advancement Plan (TAP) to supplement their School Development Plan (SDP). The TAP should be time-sequenced to enhance the implementation of the SDP.

B. SECURITY

There has been a high incidence of break-ins at schools and significant quantities of computer equipment stolen. The burglars seem to be very knowledgeable and therefore specific as to what they wanted to take, and in many instances, gained easy access to the locations where the computers were kept. At some locations, many years of school administrative and statistical data collected – extremely commendable work! – went with the thieves. Please, therefore, note the following.

1. Rooms where computers are kept should be burglar-proofed with burglar bars or other methods and have alarm systems installed where possible. Double-cylinder deadbolt locks are

recommended for doors. Administrators should have a protocol for possession of keys that permit access to computer locations, such that they know at all times who may have had access at any given time.

2. Computers should carry system administrator passwords known only to school system administrators (or designated persons where this does not apply). Systems using Windows XP and later should grant only Limited access to users, preferably on the Guest account. System administrators should be available to grant access as needed, to ensure security of data, as well as track potential sources of system configuration and other software errors.
3. Schools running networks should plan along with the ICT Desk for the implementation of client-server networks to enable greater administrative monitoring and control.

C. ELECTRICAL SUPPLY and POWER MANAGEMENT

It is a well-documented fact that the supply of electricity on the island is neither clean nor reliable. It is also well known that this has been the cause of the demise of many of the computers at our schools and offices. The following are therefore STRONGLY recommended.

1. All computers need to be connected to the electrical supply through voltage regulators or better yet UPS units. A simple formula for calculating power requirements is 500W per computer. These units should be costed on invoices for computers being purchased or being detailed on project proposals, and should be included in requests for assistance in developing ICT environments.
2. The electrical wiring of computer rooms should run independently from as close to the power company's source feed as possible – the main switch or breaker panel, for instance. The wiring should be capable of comfortably supporting a thirty (30) computer installation. It is further advisable that the computer room be provided with circuit breakers locally in the room.
3. The electricity supply for air-conditioning units in computer rooms should run independently of the wiring for the computers.
4. It is STRONGLY recommended that ALL computer rooms should be provided with voltage regulators (the simple formula in B.1 above can be used as a capacity guide).
5. Wherever it is possible, automatic-switching backup power supplies would augment all of these measures significantly.

D. ENVIRONMENTAL FACTORS

Our climatic environment seems determined to undermine our determination to develop ICT as a viable development option. Schools and offices located on the eastern seaboard are plagued with the high incidence of sea-blast from the Atlantic. Those in the Roseau Valley are affected by sulphur in the atmosphere, while those on the west are affected by dust and those in wet areas like Grand Fond and

Belles are affected adversely by moisture. In some instances, air-conditioning has proven an asset, while at other locations, the use of air-conditioning is questionable. Sea-blast has also been known to penetrate the filters of air-conditioning systems.

The ICT Desk therefore recommends the following.

1. The ICT Desk should be contacted as soon as any new or additional computers are received so that:
 - a. the equipment can be documented;
 - b. records are updated;
 - c. advice can be given especially as per issues raised in this document.

Item (b.) is particularly applicable, as an annual national review of ICT is being performed at the ICT Desk, and this information advises the Ministry of Education in its planning for training, support and other significant areas.

2. The ICT Desk and the Project Management Unit (PMU) should be consulted before computer rooms are developed or upgraded so that proper evaluations and recommendations are implemented. The ICT Desk has been developing a set of standards for computer workstations and networks that it would be useful that schools and offices adhere to. Of very significant note, computer workstations need to be constructed to proper ergonomic standards, in order to pre-empt problems associated with long-term use of the equipment.

E. USAGE

Experience in reviewing computers referred to the ICT Desk for maintenance or servicing has taught us that a large percentage of the problems found on the computers are related directly or indirectly to poor management of hardware and/or software, and end-user misuse and/or abuse. This raises concerns about initial training for end-users as well as supervision and control of access to ICT resources. The ICT Desk is willing to assist schools in arranging for this training and management.

1. It should be ensured that all users of computer equipment become aware of proper and effective usage practices through introductory training/orientation.
2. Rules and protocols should be set to guide access to and usage of computer rooms and computer equipment.
3. Secure passwords should be used as much as possible, and these should be kept confidentially, as well as changed frequently.

F. MAINTENANCE

Schools need to be aware that the acceptance of computers and/or computer equipment at their location implies costs for security, utilization and maintenance. For instance, having a computer introduces costs for printing paper and ink; accessories like power management devices, glare filters

etc.; software licenses; increased electricity costs; and replacement parts when the equipment inevitably breaks down. A World Bank survey revealed that over time, computers incur a maintenance cost equal to one third (1/3) of their installation cost. The ICT Desk attempts to provide as much technical support as possible, but with limited staff and limited funds, schools are encouraged to provide the cost of parts while the ICT Desk provides labor at no cost to them.

1. It is useful that each site (school or office) where computers are located should identify an in-house maintenance person to provide regular routine maintenance of the equipment. The ICT Desk is committed to providing basic training for such persons, as well as online technical support.
2. Regular maintenance (e.g. disk checks, antivirus updates etc.) MUST be done on computer equipment – in some cases weekly, monthly or quarterly.
3. Schools must plan and budget accordingly for proper maintenance and servicing of their equipment.

These measures are intended to raise the awareness of schools and offices (where applicable) to issues pertinent to the deployment of computers in their environment. It is anticipated that the ICT Desk will receive the cooperation of all concerned, since we are undertaking a massive venture in seeking to utilize ICTs in our day-to-day processes with little financial resources to either initiate or sustain the effort. We are extremely grateful to the many donors and well-wishers who have assisted us either directly (to schools and offices) or through the Ministry of Education, and the onus is on us to make good the initial impetus that this gives us.

G. COMMUNICATION

On another note, schools are encouraged to PLEASE use the email addresses that have been provided with their Internet accounts. The ICT Desk is in the process of compiling a list of schools' email addresses and websites, and we are asking that all schools with Internet service send a cover note to Mr. Abraham Durand, Coordinator Technical, Vocational and ICT Education at the following email address: adurand@itfordominica.org just to advise us of your email address. You will receive a confirmation response. Subsequently, you should check your mailbox several times daily, as office staff are being encouraged to send messages electronically to save delivery time as well as printing and delivery costs. Schools that still do not have Internet access should notify the Coordinator ICT promptly.

For those who may not be aware, you get a Cable and Wireless email account with every Internet account subscribed. Your email address will be your username @ cworld.dm So if your username is **bestschool**, then your school email address is bestschool@cworld.dm You then need to get your ICT support person to configure *Microsoft Outlook* or *Microsoft Outlook Express* to access your email. If you are using *Netscape* your ICT support person will know how to access your email, or call the ICT Desk for support. Your school may also get a free email address from *Yahoo* or *Hotmail* (or any other, for that matter), but the Ministry of Education is working with one of our foreign ICT Partners – Palliser Regional Schools District – to provide us with free, clean and much more efficient email addresses capable of holding much more mail and transferring much larger files electronically. "Clean" here means that there will be no unwanted mail (spam) and your mail will be automatically filtered for viruses,

Trojans, worms and other *adware* and *malware*. You will receive more information on this in subsequent communication.

Thanks for your support and cooperation in our drive to implement ICTs meaningfully into our education system.

Abraham J. Durand
COORDINATOR TECHNICAL, VOCATIONAL AND ICT EDUCATION
Ministry of Education, Sports, Youth Affairs and Human Resource Development
May 20, 2004

Appendix VII

RECOMMENDATIONS FOR THE CONSTRUCTION OF COMPUTER WORKSTATIONS AT SCHOOLS

