

MINISTRY OF EDUCATION, SPORTS & YOUTH AFFAIRS

DIVISION OF EDUCATION



Draft ICT Policy

DRAFT DOCUMENT

INFORMATION AND COMMUNICATION TECHNOLOGY POLICY
FRAMEWORK FOR USE IN THE EDUCATION SYSTEM

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PREAMBLE

This draft (IT) ICT Policy for Education is based on the Government's recognition of knowledge as a necessary basis for sustainable human development.

The Policy therefore seeks to define the roles of all parties in the new smart partnerships of the public, private and community sectors required to drive the far-reaching changes needed to achieve knowledge for all in the new Information Age.

The Ministry of Education, Sports and Youth Affairs recognizes its responsibility to utilize the technology and to facilitate wide participation in this effort to develop a meaningful policy. It seeks to articulate the principles and guide the actions required to fully utilize the available information and communication technologies to improve the management of the sector.

The ultimate purpose is for more effective creation and delivery of educational products for improved teaching and learning in Dominica.

As we seek to realize the benefits of the new technologies, the Ministry recognizes the risk of increasing the knowledge gap, and so the policy pays special attention to the issues of access and equity as we expand the opportunities for lifelong learning for all our citizens, anytime and anywhere.

This document reflects the general policy guidelines and strategies that the Ministry of Education, Sports & Youth Affairs is prepared to pursue with regard to ICT and some of the regulations that would facilitate the successful implementation of ICT in the education system.

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1.0. BACKGROUND

The last 3 decades have witnessed major changes in the way business has been conducted. Among the factors influencing these changes were the pace of globalisation, intensifying competition and developments in information and communications technology. The convergence of information and communications has led to the development of new companies, facilitated the exchange of ideas and changed the direction of many businesses. These changes have in turn resulted in the large scale reengineering of industrial processes, the compression of business cycles, a reorientation of marketing systems and far reaching adjustments to labour -capital ratios in every sector of commercial activity. In Dominica, the full potential of the **information technology industry to contribute to the diversification of the economy has been largely untapped** in spite of commendable advances made by some individuals and organizations.

As the monopoly environment dissipates, a **comprehensive enabling framework for the growth of the information technology sector is seriously needed if we are to avoid the serious risk of further marginalisation from the new world economy.** There is an urgent need for **the definition of clear, action-oriented policies that will provide a strategic framework** within which the country could position itself to seize the opportunities being provided by this new economy for increasing output, employment and foreign exchange. Issues to be addressed by this action plan will include among others:

- **The role of the education system in meeting the skill requirements of the information technology industry;** and
- Intellectual property rights;

The government has placed on record its commitment to implement policies that are aimed at ***"targeting the growth sectors of the economy, which are agriculture, tourism, the agro-processing component of manufacturing, construction to include housing, and services inclusive of Offshore Services and Information and Communication Technology".*** Extract from the 2001/20002 Budget speech by the Rt. Honourable Ambrose George, Minister of Finance, industry and Planning.

The ICT sector has been a major area Government has embraced **to target the problem of unemployment in the economy.** The provisional unemployment rate of 18% warrants serious attention. Government is facilitating a joint venture initiative between a local firm and an overseas investor for the creation of a **Call Centre**, which would create at least 300 jobs on a shift basis. This is expected to be established in the north of the island. In addition, Government is in negotiations for the acquisition of lands for the establishment of a designated ICT zone. Furthermore, discussions are also taking place with

the **AID Bank** and the **Caribbean Development Bank** for the establishment of four additional Call Centres for the creation of more jobs.

This initiative is complementary to existing **programs** that are being implemented at the **Youth Enterprise Centres** in Grand Bay, Roseau, Dublanc and Castle Bruce as well as the **Technological Centre** at Wesley. Plans are being pursued for the establishment of a Youth Enterprise Centre in the Portsmouth area. This is in keeping with government's focus on **Youth Development**. Additionally, resources have been allocated for the Youth Council, the UES Corp and the Cadet Corp.

It is government's intention to have **computers in all schools by the year 2005** in order to instil an early awareness and literacy in our children bearing in mind that we live in an advanced technological world. Further training would have to be provided to our teachers to ensure that this yields practical results.

In October 1998, the members of the then Island Representative Committee (IRC) observed that many of the member states were proceeding to introduce computers into secondary and, in some cases, primary schools. Although, these interventions of ICT in the classroom were welcomed, there were worries, however, that these **developments were occurring in the absence of a carefully thought-out plan and guiding policies and strategies**. The OERU was therefore requested to assist the Ministries of Education by preparing generic guidelines, a model policy and strategy that could then be used by individual Ministries in developing their own individual policies and implementation plans.

This sub-regional process has additional benefits:

- It increases the likelihood that the OECS states will pursue parallel strategies and thus facilitate long-term co-operation, cost-effectiveness, and the sharing of expertise in this emerging area;
- It contributes to harmonization of education within the sub-region;
- It can draw on external resources, expertise and experiences in other jurisdictions so that the OECS can benefit from the lessons learned in other regions over the past fifteen years.

The public formal education system in Dominica is comprised of four educational levels: early childhood, primary, secondary and tertiary. In 2000/2001, formal public education was offered to approximately 19 000 students in 166 educational institutions and approximately 1 177 teachers.

2.0. INTRODUCTION

Information and Communication Technology (ICT) is profoundly affecting every aspect of human activity. Its greatest potential lies in human resource development. To compete successfully in a fiercely competitive global economic environment a highly skilled and educated workforce with aptitude and skills in the application of information and communication technologies in every day life will be essential.

The MOES&YA has developed since 1998 a Long Term Education Sector Plan: 1999 - 2005 and Beyond (LTESP). This plan has been further refined under the present administration. The plan speaks of the development of ICT as a national priority. Also, The Integrated Development Plan, which is currently being drafted, seeks to promote the transformation of the structure of the Dominican economy. It notes that there exists a notable global tendency for a shift away from natural-resource-based primary products, towards knowledge-based and human-resource-intensive goods and services. It states that opportunities also exist for information technology to be the driver in the development of interactive training programmes and distance education, that will complement training efforts within the information technology industry itself as well as through the entire educational system.

Research has shown that ICT can provide stakeholders and administrators with new tools for increased communication for management efficiencies, and teachers and learners with improved learning opportunities by:

- ✚empowering citizens, managers and other stakeholders by enabling online teamwork for increased participation, collaboration and information sharing through the use of email, the Web and other remote collaboration tools.
- ✚enabling the rapid creation and inexpensive distribution of educational information and knowledge.
- ✚encouraging professional development, in service training, remote support and mentoring for lifelong learning for teachers, managers and other citizens.
- ✚facilitating fast and easy access to information and expertise around the world.
- ✚increasing motivation through the use of multimedia (sound, video, graphics, animation and text.)
- ✚allowing each student to learn at his/her level and speed thereby giving pupils greater control over their own learning.
- ✚enhancing the development of the abilities of mentally and physically challenged students.
- ✚promoting active rather than passive learning.
- ✚engaging students in research, data analysis and problem solving, thereby

facilitating higher-order thinking processes such as synthesising , interpreting and hypothesising.

In the context of these new opportunities, this national policy for ICT in Education is intended to locate Dominica in the emerging global knowledge-based economy. This will be achieved by strategic investment in education to enable greater productivity in the workforce and thus increased national competitiveness.

Throughout the world, information and communications technology (ICT) is changing the face of education. Two fundamental and complementary factors are at work. First, ICT is changing the nature of work and the workplace, and education systems must respond to this. The so-called "knowledge revolution", combined with economic globalisation, create conditions which strongly reward those countries that focus growth on knowledge-based industries. A prerequisite for this is an educated labour force of computer-literate individuals who themselves understand and can harness the power of the ICT revolution. More generally, every citizen in this and the next generation will need to have a high *"comfort level with technology to live in and contribute to a society increasingly part of an interdependent Wired world"*. So ICT is changing the objectives of education.

Second, ICT provides educators with a powerful new tool to enhance the learning opportunities for students and the professional development opportunities for the teachers. Thus ICT is also changing the methodologies through which educational services are delivered.

But, like all, powerful tools, ICT 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. Educational leaders and planners thus bear a heavy responsibility to ensure that the introduction of ICT into the classroom is managed with great care so that the very real benefits are realised efficiently and effectively, while the dangers are eliminated, or at least minimised. Careful planning, in the context of a long-term educational vision, is therefore essential.

Moreover, the introduction and sustainability of ICT in the education system is expensive. The capital cost of the equipment needed to begin the process is obvious. Not so well understood is the high level of new recurrent costs that effective use of ICT requires on a continuing basis.

The central focus of ICT in education is on the use of the computer. In this context the computer, as a piece of hardware animated by a variety of software packages, must be viewed as a multipurpose device whose educational applications include:

- Manipulating text and numerical data (word processing, spreadsheets, statistical and mathematical software, desktop publishing)
- Manipulating graphic information (scanning and drawing software)
- Storing and analysing digitised information (databases)
- Accessing and disseminating information (world wide web, CD-ROMs)
- Communicating (e-mail, listservs, chatrooms, e-fax, real-time conferencing, etc.)
- Instructional processes (software for teaching specific skills)

These applications can be used in a variety of contexts to meet various needs as follows:

2 1. Computers and Students

- Computer Literacy.** The goal is to produce students who understand how to use computers with standard software such as word-processors, e-mail, and spreadsheets in order to enhance their subsequent employability. As well, the use of software such as word processors can enhance instruction and learning in all subjects through encouraging good writing, organized work and projects, better essays, etc. Increasingly, such computer literacy is being required as a pre-requisite for entrance to many jobs in the sub-region.
- Computerized instruction in a variety of subject areas.** The goal is to use the computer with suitable instructional software to improve skill acquisition, supplement classroom instruction in particular subjects, and to meet the special needs of students who would benefit from individualized or self-paced instruction. There is a wide range of options here, from Computer-Assisted Instruction (CAI) or Integrated learning Systems (ILS) packages at one extreme, to constructivist approaches such as *LOGO* that present the computer to the student as an environment for free experimentation and the development of creativity.
- The Internet** - linking schools and students to information; schools to schools and students to students. The goal is to increase students' access to information, their ability to find, select, analyse and use information from external sources on the W~ and increase networking and communication between students and schools both within and between countries. This can have a strong positive impact on student learning in a variety of subjects.

2.2 Professional Development of Educators

- a) **Access to education information by teachers.** An incredible wealth of curriculum materials, teaching aids, sample lessons, and pedagogical ideas and tips is available on the Web. Every teacher with web access thus has an enormous library of teaching materials immediately and freely accessible. As well there are Listservs and discussion groups through which questions may be posed, and ideas and information shared.
- b) **Distance education.** Computer-assisted instruction, either in real-time courses on the web, or asynchronous packages for self-study has tremendous potential to expand the range of professional development opportunities for educators and for reducing problems of access. Networking educators. The use of e-mail, Listservs, discussion groups, etc., can connect any educator who has web access with a wide variety of networks of colleagues both within the region and internationally. No educator with web access could feel isolated from the cutting edge of research and innovation in their discipline! He or she can pose questions and request information that harnesses the expertise of international networks of educators. Educators can also contribute their own ideas, experiences and teaching strategies and bring them before an international audience.
- c) **ICT in the teacher certification curriculum.** Any serious strategy for the effective use of computers in the classroom will require that all teachers should have basic skills and qualifications in ICT. In many jurisdictions, a minimal standard of computer literacy is required as an entrance standard for teacher training. In the short term, it should at least be an exit standard. As well, all teachers will need training on the educational implications of ICT and how to integrate these into the pedagogy of particular subjects.

2.3. The Administration of the Education System

Educational Management information System (EMIS): Currently, the Educational Planning Unit uses together with the rest of the OECS a standard Performance Management Tool for data collection, analysis and management of the same for school improvement. This has been given to all schools. A separate OERU/ECERP activity is underway to develop a standard EMIS for use by the OECS Ministries of Education. Such a system can be developed incrementally and could ultimately handle or be linked with any or all of the following:

- I. School administration (student and staff records, budgets, etc.)
- II. System administration (facilities, staff, financial administration,

- III. Communication (networking all schools with the MOE, reducing the use of paper communications)
- IV. Document management.

3.0. PURPOSE OF THE POLICY

In an effort to harmonize the efforts in the education sector with the national effort, the Ministry of Education, Sports and Youth Affairs (MOES&YA) is proposing this policy for stakeholder inputs to the process of defining a Common Vision for the systematic integration of Information and Communications Technology in the education system.

As the Ministry is moving toward empowering local stakeholders through decentralization of its central and district operations, it recognizes the obligations demanded and the opportunities afforded by ICT as the nation, led by the government, seeks to modernize all aspects of management, administration and service delivery.

The Ministry itself, in its central and district operations, will therefore lead by its own proactive adoption of ICT in its internal processes and in its communication with national and international stakeholders.

Without limiting itself to any specific forecasts or projections of manpower needs, the policy addresses itself to the creation of a human resource platform through the formal education system up to the end of high schooling on which the tertiary institutions can build the array of skills and competencies needed for productivity, research, economic growth and genuinely sustainable development.

In the process, individual creativity, innovation, inventiveness will be encouraged and facilitated by improving the environments in which interaction with the technology takes place.

4.0. ISSUES GIVING RISE TO POLICY CONSIDERATIONS

There have been many MOES&YA, private sector and school community initiatives to introduce information technology in the education system over the last fifteen years. Currently, schools are utilising ICT to teach computer studies and information technology at the CXC and 'A' levels and as a component of the Business Education programme, for computer assisted instruction for remediation, numeracy and literacy, for promoting computer literacy, to enhance learning in all subject areas, and for research purposes, utilising software and the Internet. However, these initiatives and practices have had **no guiding policy**.

It is now, therefore, an imperative that MOES&YA develop a policy that will guide the successful integration of ICT in the education system. This is necessary to ensure standardisation, reduce wastage and ineffective use of the technology and optimise its use to enhance teaching and learning.

Several issues have been considered in order for the country to make optimal use of ICT in the teaching/learning process. With the rapid changes in the technology itself and its applications, these **issues and others will have to be constantly reviewed to ensure that policies are kept relevant and current**. Relevant considerations and policy objectives include:

1. The MOES&YA's institutional capacity to utilize information management tools and to ensure the implementation and support of ICT programmes in the nation's schools.
2. The revised policy instruments, including incentives, guidelines and performance evaluation instruments as appropriate to management in the information age.
3. The supply of hardware and relevant software to allow students equitable access to the technology.
4. The equipping and retooling of the Dominica Teachers' Training College (as part of the National State College) to prepare teachers in the integration of ICT in the curriculum.
5. The country's capacity to develop software and courseware, which support the curriculum and reflect Dominican culture.
6. The capacity of suppliers to maintain hardware and software supplied to the school system.
7. The funding required for the introduction, maintenance and sustainability of ICT programmes.

8. The development of ICT curricula for the primary and lower secondary levels of the education system.

5.0. ICT PHILOSOPHY OF THE MOES&YA

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

5. 1. Accessibility to and utilization of Knowledge is fundamental to the development of the Country's citizen.
- 5.2. 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.
- 5.3. ICT must be exploited to allow students greater control over their learning and thus develop skills at their own level and speed.
- 5.4. 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.
- 5.5. 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.
- 5.6. 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;
- 5.7. 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.
- 5.8. The utilization of computerized management tools within educational institutions could enhance the effectiveness and efficiency of the educational sector
- 5.9. 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 OF THE ICT POLICY

The Objectives of the policy are to:

- 6.1 promote equitable access to educational resources through the strategic application of ICT.
- 6.2 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.
- 6.3 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.
- 6.4 improve the efficiency and effectiveness of educational administration through the promotion of the use of appropriate school management information systems.
- 6.5 exploit the interactive potential of Information and Communications Technology in the provision of life long learning, anytime, anywhere via distance education programmes.
- 6.6 create smart partnerships for a sustainable ICT programme through collaboration with between the public, private and community sectors.
- 6.7 establish a schools network system for the collaborative sharing of educational resources and stakeholder participation
- 6.8 employ the new ICT tools for increased online communication, stakeholder participation and improved management of the sector.
- 6.9 Foster the concept of Life Long Learning among students and teachers and also within the general population of the Country.
- 6.10 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.
- 6.11 Ensure that there exists equitable access to ICT resources by all students and teachers within the Education system.

- 6.12 Demonstrate the MOES&YA's intention at providing a reasonable level of Computer Literacy to all students and teachers in the system.
- 6.13 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.
- 6.14 Facilitate the implementation of an Education Management Information System (EMIS) so as to ensure the effective management of the Education system.
- 6.15 Encourage partnerships between the various stakeholders in the Education Sector.
- 6.16 Provide the avenue for increased electronic networking of educators in Dominica and overseas.
- 6.17 Foster greater professional development opportunities for all educators.

7.0. ICT GUIDELINES AND STRATEGY STATEMENTS

The ICT Guidelines and Strategy Statements of the Education System have been categorized into three areas as follows:

7. 1. Curriculum, Training and Instruction

A large body of research shows that adequate training of teachers to use ICT effectively in the classroom is an essential prerequisite for success. Such training must achieve several distinct goals:

- a) The teacher should be a confident computer-user who transmits positive attitudes to students. The attitude is at least as important as the level of skill, teachers and students can learn together if they are enthusiastic and believe that they will be successful. All teachers thus require computer literacy training, unless they already possess it.
- b) Teachers should be trained to help students acquire basic computer literacy: the skills common to the use of all software packages. A smaller number of specialized ‘‘ICT teachers’’ who are charged with teaching computer use and more advanced ICT as a subject will require this training in greater depth.
- c) Teachers of individual subjects should be trained in the applications of ICT. Subject area specialists, curriculum officers, etc., would need such training in greater depth to take leading roles in matters such as software selection and implementation, in-service professional development, etc.

The following is proposed:

Statement No. 1:

The MOES&YA will ensure that students at both Primary and Lower Secondary levels acquire, through integration of ICT into the curriculum, the following skills:

- 1 . Composing a document using word processing (e.g. MS Word) functions namely copying, cutting, pasting, merging, saving and printing;
2. Preparing a simple spreadsheet (e.g. MS Excel);

3. Creating, querying, saving a simple database (e.g. MS Access);
4. Demonstrating an understanding the PC including the Operating System (e.g. Windows 98, Me, 2000 & XP, MAC OS);
5. Demonstrating an understanding of Computer Programming;
6. Sending and receiving electronic mail;
7. Accessing web sites and performing searches on the Internet.
8. Making critical judgement of the validity of information on the Internet.

Statement No. 2

The MOES&YA will identify, recruit, train and deploy suitable persons for the development, management and operation of ICT systems at all levels in the education system.

Statement No. 3:

The MOES&YA will implement mechanisms for attracting and retaining teachers in ICT within the education system.

Statement No. 4:

The MOES&YA will provide incentives to teachers and administrators who are exceptional in effectively promoting and utilizing ICT in the classroom and in simultaneously performing other functions.

Statement No. 5:

The MOES&YA will establish a group of subject specialists (in at least the core subject areas) at the primary and secondary levels. That group will liaise with and share information with the MOES&YA's representatives on the OECS ICT Education Committee, who will co-ordinate the approach for the use of computers in the teaching of each subject area. This group will also be closely linked to the curriculum officers of the MOES&YA.

Statement No. 6:

The MOES&YA will utilize the subject-specialist group to provide professional development workshops for teachers.

Statement No. 7:

The MOES&YA will ensure that ICT is used in the classroom to support the mastery of numeracy, literacy and critical thinking skills.

Statement No. 8:

The MOES&YA will ensure that ICT is used in the classroom to address the individual needs of students with varying abilities.

Statement No. 9:

The MOES&YA will provide the opportunity for fostering the creative capacity of students and teachers in the development of hardware and multimedia software.

Statement No. 10:

The MOES&YA will ensure that training of teachers in computer literacy and the educational uses of ICT will precede the introduction of equipment into the classroom.

Statement No. 11:

The MOES&YA shall provide in-service training in ICT to all teachers.

Statement No. 12:

The MOES&YA will liaise with the Clifton Dupigny Community College (Dominica State College) and other educational institutions to ensure that subject-specific pedagogy includes adequate coverage of the integration of ICT in the classroom. If necessary, it will be advised that courses be modified or new courses be introduced to satisfy that need.

Statement No. 13:

The MOES&YA will ensure that student will not have access to obscene material and undesirable Sites on the Internet.

Statement No. 14:

The MOES&YA will provide appropriate facilities for stakeholders including the National ICT committee, administrators and teachers to examine and evaluate relevant software packages for integration in the curriculum.

7.2. Planning and Administration of ICT Initiatives

Firstly; planning and implementation of hardware and infrastructure acquisition, installation and maintenance involves a number of issues:

Hardware has a finite life span both because it wears out and because it becomes technologically obsolete.

Technology is evolving rapidly and improvements in performance often depend on upgraded hardware. Flexible, open and upgradeable architectures help to ensure that the maximum lifetime of hardware purchases is obtained.

Sub-regional co-operation, sharing of technical expertise, implementation of common systems (such as an EMIS), etc., will all be simplified if Ministries agree on common standards and implementation architectures.

Secondly; software decisions fall naturally into two parts: general-purpose software and instructional software. For general purpose software (word processing, spreadsheets, databases, e-mail, browsers, graphics, etc.) choices should be guided by observing what is most widely used elsewhere. Students benefit by becoming familiar with the packages they are most likely to meet in the workplace and elsewhere.

Choosing instructional software is much more complex. The field is changing rapidly and there is a wide variety of material available (current estimates about 20,000 titles in English alone). Most educators, however, are conscious of a real shortage of high quality, educational software whose effectiveness has been adequately tested (apart from the manufacturer's own claims, which are hardly objective!). Finding good software to meet particular instructional needs is thus a major challenge. Some information is available from various web sites, although it is mainly anecdotal and based on the individual reactions and experiences of teachers who have used the software in their classes. There are also firms, consultants and Institutes involved in evaluating and selecting appropriate software for use in the school system. One of these Institutes is the Educational Products Information Exchange (EPIE) that an Educational Software Selector Database (TESS) which is available on CD and their website (<http://www.epie.org>). The MOES&YA will work with the OERU to obtain access to the resources of that Institute.

Most software packages are developed for the North American (mainly USA) market so there are issues about content, linguistic and cognitive style and cultural appropriateness when using the packages in other countries. In addition, software packages of any complexity usually are sold under site licenses that can be prohibitively costly for widespread use.

Finally; in the region there is a need for MOES to frequently monitor educational institutions to ensure that they are sustainable and that the program is meeting the needs of stakeholders. Given the limited resources available, ICT tools can facilitate the kind of monitoring that ministries need to do. Components such as academic performance and physical development are among the areas that must be assessed, and where necessary provided with support for their optimal development. As a result of assessment and monitoring, additional ICT tools can be used to enhance support services to students. These include the provision of software, and hardware systems to students who are physically and mentally challenged.

The following is proposed:

Statement 15:

The MOES&YA shall ensure that ICT in the education system serves several purposes, all of which will contribute to the establishment of a knowledge-based economy. These purposes will include:

1. Supporting student mastery of numeracy and literacy skills at the primary level;
2. Providing remediation to students where necessary;
3. Facilitating the implementation of Integrated Learning Systems (ILS);
4. Improving the general quality of and access to learning throughout the curriculum;
5. Students and teachers developing education related multimedia applications using software Authoring tools;
6. Fostering the creative capacity of students and teachers;
7. Facilitating the dissemination and sharing of ideas between the various stakeholders in the education sector;
8. Improving the efficiency of administration of educational institutions;
9. Facilitating the timely and accurate flow of data and information between educational institutions, the MOE, the OERU and other relevant organizations;
10. Providing strong support for technical and vocational programmes at all educational institutions.

Statement No. 16

The MOES&YA will work with stakeholder groups to develop strategies to deal with licensing, intellectual property rights, use of software, disposal of used computer equipment, security and information dissemination associated with ICT in the Education System.

Statement No. 17

The MOES&YA will facilitate the establishment of appropriate organizational structure to facilitate the integration of ICT into the education system of the Country.

Statement No. 18

The MOES&YA will ensure the establishment of the necessary infrastructure to facilitate the adoption of ICT within the education system.

Statement No. 19

The MOES&YA will work with stakeholder groups to establish procurement guidelines and procedures for the acquisition and security of ICT equipment, peripherals and accessories.

Statement No. 20

The MOES&YA will ensure the establishment of protocols for the identification, evaluation and selection of appropriate software for use in computers at all levels of the Education system.

Statement No. 21

The MOES&YA will ensure that before instructional software is deployed in any classroom:

1. It would have been evaluated and approved by the National ICT Committee.
2. There would have been adequate training of the classroom-teacher in the use of the software.

Statement No. 22:

The MOES&YA will establish mechanisms that foster collaboration in the implementation ICT between the private sector and educational institutions.

Statement No. 23:

The MOES&YA will make necessary budgetary provisions (in collaboration with other stakeholders) associated with the capital and operational costs of sustaining ICT systems.

Statement No. 24:

The MOES&YA will work with stakeholder groups to establish rules and procedures for the acceptable use of ICT in the education system.

Statement No. 25:

The MOES&YA will adopt a common set of standards for hardware and system architecture for use in the Education System.

Statement No. 26:

The MOES&YA will adopt an explicit strategy for technical support, with staff and budget adequate to service the needs of all users and computers in the Education System.

Statement No. 27:

The MOES&YA will establish an IT Team comprising an IT Co-ordinator and System Administrator(s) to support the integration of the technology into the curriculum of schools and will make provision for the continuous training of that team.

Statement No. 28:

The MOES&YA will ensure that all educational institutions are linked together in a secure network for administrative (EMIS) purposes, with access to the Internet for instructional and professional development (e.g. electronic research and communication).

Statement No. 29:

The MOES&YA will assist every school (Primary and Secondary) to develop a Technology Plan, which would act as a guide for that school's integration of ICT into its curriculum.

Statement No. 30:

The MOES&YA is cognizant of the potential of bodily harm that students may be exposed to after the prolonged use of desktop computers and as a consequence will ensure that standard ergonomic principles are adhered to, including the proper design of computer workstations. A recommended workstation specification is detailed in appendix C.

Statement No. 31:

The MOES&YA, through its nominee on the *OECS ICT Education Committee* will periodically (at least every year) review Hardware and General-Software Standards and recommend changes/upgrades as needed.

Statement No. 32:

The MOES&YA will ensure that its nominee on *The OECS ICT Education Committee* provides advice on the choice of instructional software to be used by educational institutions. The OERU will assist in the co-ordination of that committee and provide members with access to external expertise and information databases so that choices are made on the basis of full review of the prior experiences in other jurisdictions and organizations.

Statement No. 33:

The MOES&YA will work with educational institutions to make available the facilities, equipment and personnel to permit equitable access to ICT for ALL students.

Statement No. 34:

The MOES&YA will adopt a standard suite of productivity tools as the generic software package for all computers used in the education system.

Statement No. 35:

Principals of Educational Institutions will ensure that the guidelines for acceptable use of ICT in education have been incorporated into the School Rules.

Statement No. 36:

Principals of Educational Institutions will keep a record of all software and software upgrades acquired by their institutions and ensure that their institutions have the appropriate licenses for the use of such software.

Statement No.37:

Principals will be responsible for all ICT resources on the premises of their institutions.

7.3. Assessment Support and Sustainability of ICT Initiatives

Introduction and sustainability of educational ICT could be expensive. Given the resource base of Dominica, choices and priorities will be essential. While the long-term goal may be to have computers in every school accessible to every student at every level, this will in most instances take many years to achieve.

A World Bank study (Potashnik & Adams, 1995) provided the following cost estimates for implementing a computer laboratory of 15 machines in a Jamaica school:

- Initial investment cost: US\$ 44,119
- Additional recurrent costs: US \$16,224

Under rather generous assumptions about amortization (for example, a 5 year useful life of computers and peripherals) and interest rates, this means that the system could be established and maintained indefinitely for an annual charge of about US\$ 27,000 per year. It should be noted, however, that school systems in other jurisdictions have found that a three-year amortization period is more realistic, for several reasons (technological obsolescence of hardware and software, hard usage and abuse of machines by students, loss, damage and theft). A three-year period would significantly increase these estimates of recurrent costs. See the Edwards estimates below, which is for a 5-year period.

A Project Management Unit (MOES&YA) Study (David Edwards, May 1999) also provides the following cost estimates (EC\$) for implementing ICT in a number of select schools as Centres:

Consultancy	6 man months	407 536
2 Curriculum Coordinators	120man months	540 000
1 Van		70 000
A&E Modular Designs	180 man hours	75 000
IT labs at 4 secondary schools		2 006 000
IT lab @ Asst. secondary school Upgraded		50 000
IT labs at new secondary schools upgraded		500 000
IT labs @ primary schools		3 018 750
Leased computers & software		5 625 000
Overseas training		713 184
Procurement of furniture		500 000
Local training	60 man hours	398 732
SUB TOTAL		13 904 202
10% contingency		1 390 042
TOTAL COSTS		15 294 244

Even where it is not possible to put computers into a school immediately, it is important to provide computer access to teachers so that they can become familiar with the technology; use it for their professional development and as a source of educational materials, and to pave the way for its later introduction into the classroom. Thus, training of teachers in ICT is considered an essential prerequisite for the successful introduction of computers into the classroom.

Internet access for teachers and students is essential, but needs careful management. This can, in most instances, be best provided in school libraries, where teachers and students can integrate the Internet as a powerful new information source for use. Linking networked computer labs to the Internet could pose certain problems (cost, dangers of inappropriate use, exposure to viruses, distortion of usage patterns away from primary purposes).

The following is proposed:

Statement No. 38:

The MOES&YA will encourage Educational Institutions to make ICT facilities available to the Community and will use the proceeds from the sale of these services to upgrade and sustain the facilities and programmes. However, these activities will not compromise access and quality of services of the students.

Statement No. 39:

The MOES&YA will collaborate with Educational Institutions to examine the utilisation of optimal configuration of classroom/library/lab, hardware and software (with focus on access and quality).

Statement No. 40:

The MOES&YA will establish appropriate mechanisms for the involvement of all stakeholders in determining the relevance and future use of ICT within the education system.

Statement No. 41:

The MOES&YA will explore all possible options of procuring computer systems given due consideration to the upgrading, maintenance and eventual replacement of these systems.

Statement No. 42:

The MOES&YA acknowledges that there are requirements of recurrent costs to support ICT in the Education System and will make the necessary annual budgetary allocation based on but not limited to the following terms:

1. Training of teachers and technical personnel;
2. Salary & support: technical support personnel (Ministry based);
3. Salary & support: Computer Lab Co-ordinator and Instructor (School based);
4. Equipment upgrades, maintenance and repair;
5. Software licenses and upgrades;
6. Insurance of equipment;
7. Supplies (paper, toner, diskettes, etc.);
8. Utilities and line charges (electricity, telephone, Internet, etc.);
9. Participation in conferences.

Statement No. 43:

The MOES&YA will adopt a partnership approach to the financing of ICT in the education sector. Possible partners could include:

1. Other Government departments;
2. Private and Public Sector Organizations;
3. Telecommunication Companies (incl. ISPs)
4. Individuals, Groups and Organizations from the local or international Community;
5. The educational institutions through revenue-generating activities;
6. Cost-sharing mechanisms with parents;
7. Local and International funding Agencies.

Statement No. 44:

The MOES&YA will establish appropriate mechanism for educators to undertake research and to assess the impact of ICT in the education system.

8.0 FACTORS THAT WILL IMPACT ON THE POLICY

- 8.1 Equity of access to the technology for all students.
- 8.2 Preparation of teachers to optimize the use of ICT in the teaching/learning process. The process of preparing teachers in training as well as the upskilling of those now in the classroom.
- 8.3 Provision of technicians to support the work of teachers and administrators in the schools.
- 8.4 Security of hardware and software in schools.
- 8.5 Health and safety issues
- 8.6 Cultural relevance and suitability of courseware
- 8.7 Sustainability of programmes considering the high rate of obsolescence of equipment and the high cost of replacement relative to the country's resources.
- 8.8 Capacity of the central Ministry to manage the partnership process for development and to monitor the implementation of the policy at the institutional level.
- 8.9 The creation of MOES&YA Educational Technology Unit. New posts in IT, print, video and courseware production to be provided so that courseware would be developed in this unit, or customised where necessary.
- 8.10 The MOES&YA websites will be developed, together with an INTRANET for the school system using content prepared by the various units of the MOES&YA as well as by individuals and groups within the sector. The Intranet will be of help to teachers, administrators, students, parents and other stakeholders.

9.0 POLICY POSITIONS

9.1. Equity of access is an overriding consideration. The Ministry of Education, Sports & Youth Affairs will therefore work collaboratively with educational institutions to make available facilities, equipment and personnel to permit access to ITC for all students:

- 9.1.1 Schools will be expected to use the most effective configuration - classroom, type of equipment, networking, and software - to optimise both access and quality.
- 9.1.2 While schools are expected to make ICT facilities available to the community and to use the proceeds from the sale of services to sustain and develop their ICT facilities and programmes, outreach and commercial activities must not compromise access and quality for the students.
- 9.1.3 Accountability for all ICT resources, as with all other school property and facilities rests with the school's administration.

9.2. Students completing primary education should have had some exposure to ICT, and possess some awareness of its applications.

9.3. Students leaving grade 11 (5th Form) after five years of secondary education must be computer literate defined as being able to use a computer safely to do the following:

- 9.3.1 compose a document using word processing functions, being able to copy, cut, paste, save and print
- 9.3.2 prepare a simple spreadsheet
- 9.3.3 send and receive an electronic mail message
- 9.3.4 access sites on the internet

9.4. ICT at the institutional level will serve multiple purposes, all of which contribute to the creation of a knowledge-based, information oriented, systems driven modern society. These include primarily:

- 9.4.1 supporting individual mastery of literacy and numeracy skills at the primary level
- 9.4.2 improving the general quality of learning throughout the curriculum
- 9.4.3 providing strong support for technical/vocational programmes in the upper levels of the secondary system
- 9.4.4 remediation where needed
- 9.4.5 increasing professional development opportunities for teachers and other staff
- 9.4.6 improving the efficiency of the school's administration, including student record keeping

- 9.4.7 facilitating the accurate and timely flow of data and information between institutions and the Ministry of Education, Sports & Youth Affairs
- 9.4.8 building the creative capacity and the expertise of ICT users and sharing the products with others

9.5. The Ministry of Education, Sports & Youth Affairs will have the responsibility of ensuring the most efficient use of all resources involved. It will expand its existing courseware evaluation committee to include a broader representation from the stakeholder community to perform a number of functions. The ICT Standards Committee will perform the following:

- 9.5.1 advising on the appropriateness of hardware
- 9.5.2 determining approved software for educational/curriculum purposes
- 9.5.3 determining management systems to ensure compatibility with the national system

9.6. The Ministry of Education, Sports & Youth Affairs will actively encourage collaborative partnerships in furtherance of the national development objectives. To this end, it will:

- 9.6.1 work with public and private, local and foreign training institutions to expand the number of teachers equipped to work in an ICT mode within the schools
- 9.6.2 develop guidelines for schools to work directly with providers of goods and services required by the ICT programme in their institutions
- 9.6.3 remain responsive to the needs of corporations, small business enterprises and individuals in respect of ICT skills and the relevant curricula
- 9.6.4 encourage the sharing of skills between the schools and the workplace
- 9.6.5 provide information to the private sector on partnership opportunities with individual educational institutions, including the extent of tax incentives for benefactions.

9.7. The Ministry of Education, Sports & Youth Affairs will also work with the Ministries of Finance, Industry & Planning, Trade & Marketing, and with the Office of the Prime Minister (Information) as well as the Cabinet Office, making maximum use of the opportunities available through the Telecommunications Policy arrangements to ensure that access to the relevant services is available to the entire student population at the best possible cost.

9.8. The staffing arrangements in the schools and the recurrent costs for approved programmes will be reviewed and modified from time to time by the MOES&YA to ensure that the efficiency of the operations is supported.

9.9. Financing of ICT within the education sector will remain as a partnership exercise. The partners will include:

- 9.9.1 The Government of Dominica through the Ministry of Education and its agencies
- 9.9.2 Public Corporations and Statutory Bodies
- 9.9.3 Private Enterprise
- 9.9.4 Local and International Foundations
- 9.9.5 Bilateral and Multilateral Organisations
- 9.9.6 Community Organisations
- 9.9.7 The educational institutions through income-generating activities
- 9.9.8 Parents through the cost-sharing mechanisms in secondary and tertiary institutions

9.10. All policies and provisions in respect of copyright, professional conduct, confidentiality, rights and responsibilities of lecturers, teachers, instructors, trainees and students will apply to the conduct of ICT programmes.

***Ministry of Education, Sports & Youth Affairs
Education Planning Unit
Education, Science & Technology Building
Cnr. Cornwall & Hall Streets***

Roseau

September 2001

Please send your comments on this Draft to MOES&YA

10.0 REFERENCES

1. Minott & Associates, (2000). A Proposal for the Development of a High Technology Sector within Dominica.

***Notes:** Such an ambitious plan would require a multiyear commitment to education and training, and marketing of the country with the international IT circles. Neither of these is presently taking place. Though there are several commercial institutes that offer training courses in basic computer literacy, the vast majority of primary and secondary school students have minimal exposure to computers within the school. Minott & Associates wishes to design an IT educational initiative that would involve all critical aspects of Dominican Society. Minott & Associates proposes a major educational and community organizing initiative to sensitise government, business and community within Dominica to the demands and possibilities engendered by the growing dominance of the ICT sector within the global economy. Their multi-pronged approach will focus upon vital education and training within various critical institutions and actors in education, business and government. The primary goal is to place information technology at the forefront of the national agenda in the areas of education and business development.*

2. Morris, Halden. A & Hamil. S (1998). Blueprint for the Introduction of Technology Education in the Curriculum of Primary and Secondary schools in the CARICOM. A CARICOM Project. Submitted by the Education Research Centre (ERC), School of Education, Faculty of Arts & Education, UWI, Mona, Jamaica.

***Notes:** This project initiated by the CARICOM secretariat, is the direct result of the concerns expressed by CARICOM member states about the hindrances to their pursuit of development goals. To put the machinery in action, attention was directed to the education arena as the sector most likely to begin to deal with the problems at their very root. Thus it was envisaged that the development of the blueprint for the introduction of technology education programmes for the primary and secondary schools was pertinent. Arising out of the recommendations were the following: a) technology education should focus on the development of technological knowledge, skills, competencies, and appropriate attitudes through problem solving; b) technology education should not be limited to computer and information technology but should cover the foundation for developing skills and competencies in the wider areas of technology. The application of the sciences and design concepts must pervade the objectives of a technology education programme; c) the infusion/integration approach at the primary and lower secondary level, and the development of the broad principles, procedures, and the applications of technology at the secondary level should be seen as the major strategies for a technology education programme; d) technology education should be implemented at all grade levels, utilizing the necessary resources including human resource and computers to facilitate a more hands-on delivery at the primary level, and a more problem-oriented approach at the secondary levels; e) the provision of appropriate classrooms, computer laboratories, other workshops and laboratories, and tools to facilitate the delivery of technology programmes must be given priority since this is critical to the success of a technology education programme and f) closer collaboration between private sector and the education authorities should be encouraged, especially in the development of curriculum for technology education.*

3. Dr. Addison T. Colaire, (2000). First Annual Computer and Information Technology Symposium-Roseau, Dominica. Third World Educational Foundation.

***Notes:** The one-week symposium had as its objective the positioning of Dominica as the best Caribbean site for high-tech subsidiary establishment. The late Dr. Colaire firmly believed that the symposium would be of tremendous economic value to the development of Dominica. He stated that 'Besides preparing all Dominicans to move across to the more competitive side of the information technology divide, the event itself will provide benefits to the tourism and investment sectors by the quantity and quality of the participants'. The symposium, however, met with a qualifying failure since less than 20 firms participated from the more than 300 local, regional and international companies, which were invited. Local as well as external participation was poor.*

4. Hon. Roosevelt Douglas, Prime Minister of Dominica, (Feb. 2000). On the Creation of an InfoTech Centre in Dominica. The Dominica Chronicle.

***Notes:** In looking at the pivotal role of InfoTech in the development of Dominica, Hon. Douglas said that one of his goals for the development of Dominica is the development of our human resources, and he sees IT as one of the tools in doing this. He stated that, 'computers must be made available to every classroom in Dominica'.*

5. Jukes, Ian & McCain Ted, (2000). Beyond Technology to the New Literacy. Thornburg Center for Professional Development. The info Savvy group and Cystar, 2000. Website: <http://tcpd.org>

***Notes:** The world has changed. Today we are operating under a completely different set of rules that have turned many of our assumptions about learning upside down. What does it really mean to be literate in an age of computers, networks, electronic mail, multimedia communications and Internet publishing? What are the new basics that all students need to have in an electronic age? This paper examines several faulty assumptions related to the effect of technology on learning and outlines how we can move beyond Technology to the new literacy by changing the focus from LOTS (lower order thinking skills) to HOTS (Higher-order thinking skills. For teachers, co-ordinators, and administrators who are struggling to address issues relate to national standards, curriculum and technological integration this is important. There remains a fundamental a abyss of misunderstanding about the role that new technologies could and should play in teaching and learning. Over the years there have been dozens of studies about the effectiveness of new technologies in enhancing learning. These studies show consistent results. The bottom line is that vast investments in technology have been largely ineffective - there has been little if any demonstrated effect on student learning based on the way its being used today. The problem lies not with the tools but with use of tools. When used appropriately as a tool of discovery, new technologies can profoundly transform learning. Unfortunately, this hasn't generally happened. The use of technology is still on periphery of education. Even after years of use, there has been very little discussion about the real role of new technology in learning, as well as deep levels of misunderstanding about the role technology can and should play in education and about its potential to transform the learning cycle.*

6. Cadette, Sylvester J. (2000). The Community/Commercial Telecentre. Office of the Minister for Communications and works, Roseau, Commonwealth of Dominica.

Notes: Dominica is mainly an agricultural-based economy and diversification is seen as a tool for developing other sectors. This would lead to reduce economic vulnerability to external forces, improved productivity, job creation and economic development on a sustained basis. The Dominican government has realized that the Telecom sector is undergoing dramatic changes and has set in motion a global process of transformation. It is understood that Telecommunications today is not just telephone but also integrated voice, data, graphic and video and the internet. Telecom is a significant agent of change affecting social, political. Cultural and economic health. It is increasing openness, accessibility. Accountability, connectivity, networking, democratisation. Leading to considerable social transformation. Telecommunication is the infrastructure of infrastructure. With such a multifaceted and dynamic sector that could have great impact on development, it is critically important to focus on developing content to suit local conditions. Dominica has a great deal of cultural heritage in art, craft, music, dance, and culinary skills etc., which need to be converted to the electronic media to take real advantage of recent IT developments.

7. Edwards, David, (1999). Infusing Information Technology into the Education Reform Process. Project Management Unit. Ministry of Education, Sports & Youth Affairs, Roseau, Dominica.

Notes: The argument offered is that investment in IT is essential. It is proposed that IT should be accessible to all students and that a lease arrangement should be considered for computers. This is based on the assumption that a policy that restricts IT to large schools will further exacerbate the disparities of school size differences and create difficulties when schools that are not selected are offered computers or Internet services by benefactors. The proposal for lease is reflective of the inbuilt obsolescence in computers, and the magnitude of the initial cost and that of maintenance. The proposed intervention is estimated at EC\$ 15.2 M. This is probably the cheapest cost for a well-organized policy framework that allows for a fairly equitable distribution of opportunities. The organized policy framework that is offered by the proposal would offer opportunities for more effective preparation for the information era.

8. Draft IT Policy, Ministry of Education & Culture Kingston, Jamaica, December 1998.

9. IT2000- A Vision of an Intelligent Island, Singapore National Computer Board, November 1997.

10. Seven Steps to Responsible Software Selection, ERIC D 1 GEST-Clearing house on IT.

11. The Millennium Project Proposal- The Incorporation of IT in the Education System, Ministry of Education, Human Resource Development Youth & Sports, St. Lucia, February 1999.
12. Student and Staff Access to Online Information Resources, The Winnipeg School Division No. 1.
13. Implementing the Executive Order on Computer Software Piracy-Federal Software Management Program Model Guidelines, USA Federal CIO Outreach Committee, March 1999.
14. Draft Education Policy, Ministry of Education, Culture and Women's Affairs, St. Vincent and the Grenadines, December 1995.
15. OECS Education Reform Strategy (June 2001). Model ICT Policy Document for the Education System. Information & Communication Technology (ICT) In the Education Systems of the OECS. East Caribbean Education Reform Project. OECS Education Reform Unit. Castries, St. Lucia

Note: *The OECS Education Reform Unit has developed a series of policy guidelines on the use of Information Communication Technology (ICT) within education systems in the OECS. The ICT policy guidelines covers several issues related to the use of ICT in administration, curriculum instructions, training, assessment and support activities within the education system of the OECS member states. This will assist ministries of education in the effective utilisation of computers in schools and in particular, ensure that ICT is used in the classroom to support the mastery of numeracy, literacy and critical thinking skills. The OECS's input will inform the evaluation, cost effectiveness, and relevance of all instructional software before it is approved for the classroom and to facilitate training for the classroom teacher in the use of the software. The OERU's contribution follows a request for the unit's assistance in the development of policies and strategies to guide the introduction and effective use of ICT in the education system of member states. This move is in keeping with global trends where ICT is providing educators with new tools that could enhance the learning opportunities for students and the professional development opportunities for teachers in the sub-region.*

16. Government of Dominica/Department for International Development (DFID), UK, (April 2001). Mission Report of the Information Communications Technology Specialist. Cambridge Education Consultants.

***Notes:** This report speaks of the development of a minor option in ICT for the Associate Degree programme developed at the Dominica Teacher's College (DTTC) as part of the Secondary education Support Project (SESP). It includes a 39-hour course on the management and maintenance of computers in schools. The several modules A1 - C5 covers managing school ICT, ICT safety, security and maintenance and ICT in the school curriculum.*

17. 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.

***Notes:** He states that the govt. of Dominica has identified the ICT sub-sector as an area to be pursued for further economic diversification. He noted that at all levels there is a keen interest in IT. Both the state sector as well as the private sector are of the view that the ICT industry is the primary option for economic transformation, especially in light of the daunting prospects for the banana industry. However, the report pointed out in a very salient manner the absence of any policy on the ICT sector, nor any planning nor organisation for its development. It continues with the indictment that Dominica does not appear welcoming or facilitating to foreign investment. The report says that Dominica's ICT sector currently consist of some 19 firms of which 15 are foreign-owned. The Dominica foreign investor presence runs contrary to the norm. The high upfront government fees along with the absence of any setting-up assistance, the lack of appropriate workspace, and the consequential substantial expenditure for leasehold improvements, would normally be considered disincentives to foreign investment. Electricity services are unreliable and unstable, so much so that most firms install generating and stabilizing equipment to ensure a constant and adequate supply. Two thirds of the existing firms are in Internet gaming. Dominica provides a shelter from the scrutiny of tax and tight regulations. The only area of success is in telecommunications, which is reliable and of high quality. However, lower rates would attract more business. Human resource development in ICT is low level, especially in programming and software development. Training needs to be provided. Ultimately, Dominica's success in the IT industry can only be assured through a smart partnership: a) all stakeholders must be involved in the process, b) a national policy on ICT is an imperative and c) a deliberate strategy to develop local businesses to take advantage of joint venture and outsourcing opportunities.*

18. Richards, George, (2000). Centre of Specialisation in Information and Communication Technology in the OECS. A Needs Assessment Report. Prepared for the Education and Telecommunications Reform Units of the OECS.

***Notes:** The report states that the development and implementation of a centre of specialisation for ICT is a critical and necessary requirement for regional economic competitiveness. The findings of the needs analysis study indicate that significant deficits in ICT skills exist in the region and that immediate and continuing delivery of such skills is necessary to ensure that economic development objectives of the ICT sector are met. While*

alternative models for its design exists; the preferred model consists of a virtual centre based on decentralised program development at the national colleges, and a central locus for accountability and control at the Sir Arthur Lewis campus. The centre is charged with the delivery of a wide variety of ICT skills through a wide variety of instruction delivery modes. A virtual centre can best provide for the delivery of these skills, and yet be implemented and be operated at lower cost and with lower human resources levels than could conventional institutions.

19. OECS, (2000). Summary of Conclusions of the Thirteenth Meeting of OECS Ministers for Education. Draft copy. St. George's, Grenada. October 23-24, 2000.

Notes: *Agenda item 7.0 was a discussion of policies presented to the meeting, and in this case, the OECS Model ICT Guidelines and Strategy was looked at. The meeting noted that more needs to be done in regards to the need to present financial implications of implementing ICT in education projects in addition to the guidelines. Indications of necessary funding are required for budgetary proposals. It agreed that the OECs should keep ICT on its agenda and that Ministers should facilitate the setting up of a committee to assist in the development of a national ICT policy, through a consultative process. The OERU will continue to provide assistance to promote this activity. The Ministers further requested that the OERU prepare an implementation plan for the strategy.*

20. Durand, Abraham. J, (1999). The State of Information Technology In The Department of Education of the Commonwealth of Dominica. Education Planning Unit, Ministry of Education, Youth Affairs & Sports

Notes: *The use and deployment of ICT has been painstakingly slow and the provision of computers for access by students has not been given much attention either the report noted. The author further states that the training offered to department personnel is of a limited nature in both scope and distribution. Electricity supply and reliability is another issue that needs urgent attention. Internet access is not available to most primary school and its only available in a minority of the 15 secondary schools. A large percentage of computers now available at schools were acquired or donated as used computers of obsolete or near obsolete specifications, and the staff lack adequate training to use them in any meaningful way. Nationally, the computer pupil ratio is 1:787 at the primary level, 1:53 at the secondary level and 1:23 at the tertiary level. 10% of the nations secondary students receive either CXC level or other forms of IT tuition, while another 1% have access outside of the school. Computers in schools are generally acquired through their own efforts. In that regard, privately assisted schools have a better computer pupil ratio than public schools. The Ministry of Education does not own any proprietary licenses for its software and depend on preinstall software provided. Computers at most primary schools use WIN 3.11 and very few have WIN95, 98 or 2000. A very limited percentage of staff have basic knowledge of the PC and their operations. 63 % of the staff of the department of education lacks a basic knowledge of the PC, 29% are at basic*

level and 8% at the intermediate level. Only 2% are at advanced level. The Education Planning Unit of the Ministry of Education has been providing technical training in the use and maintenance of both software and hardware. The report concluded that the majority of pupils at the primary, secondary and tertiary levels have no access to ICT while at school.

21. Durand, Abraham. J, (2000). An Assessment of the Operation of Computer Rooms at Secondary schools in the Commonwealth of Dominica. Education Planning Unit, Ministry of Education, Sports & Youth Affairs.

Notes: The author noted that the presence of ICT in secondary schools in Dominica is generally an unplanned, uncoordinated exercise from the point of view of the Ministry of Education. Nonetheless, the efforts of the schools that has gone ahead and set up their own "IT Advancement Plans", albeit informal and/or sometimes not effective, are highly commendable. At some locations, teachers are very dedicated. The report, however, tends to agree with the Education Ministry, that some form of coordinated, structured approach is needed to make the process of ICT education and use more equitable to all players and clients of the education process, and more efficient at producing the kinds of divergent human and economic development that are considered to be the end of product of the education system. Given the high cost of the initial investment in, as well as the volatile nature of, computer and related instructional technologies at the schools, much attention needs to be paid to devising ways and means of maximising the use of these, and putting them to such protective use as to reap optimal long-term benefits from their use. The writer would like to see among other things the formulation of an IT policy, the establishment of a national council on IT and the creation of an IT Unit in the Ministry of Education.

11.0. APPENDICES

Appendix A: Regulatory Statements

(1) 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 free wares and sharewares) on the school's computers or networks.

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

1. 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. Hate mail, harassment, discriminatory remarks and other ant-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 B: Key Policy Objectives

INFORMATION AND COMMUNICATION TECHNOLOGY:

1. Development of a National Policy on ICT
2. Provide access to ICT for the entire population
3. Implement measures that will ensure that students will be competent and proficient in ICT
4. Develop a national capacity in ICT
5. Establish a National Council on ICT
6. Collaborate with regional and international councils of ICT

Appendix C: Policy Priorities for ICT

1. Development of a National Policy on ICT:

- Review the state of ICT in Dominica
- Establish consultation process on ICT
- Agree on content and format of the National Policy on ICT
- Develop a policy framework on ICT to guide the choice and judicious application of ICT for national development
- Preparations of plans for dissemination and cultivating a culture for appreciating the importance of ICT in the daily life

2. Provide adequate access to ICT for the entire population:

- Ensure that the masses have adequate skills in reading, speech and written communication and calculation
- Produce over time a computer literate society
- Develop programmes both in and out of school to popularise ICT indicating to the population that ICT is involved in all their everyday activities. ICT must become part of the culture
- Introduce the concept of best practice, providing students, workers and others with the basic tools to think and act accordingly in their daily lives/activities

3. Implement measures so that students are competent/proficient in ICT

- Ensure that education in ICT is part of the entitlement of all
- Children
- Provide the necessary infrastructure, training and other resources for the delivery of ICT
- Ensure that the design and mode of delivery of school curricular are such that children benefit
- All children should be educated in ICT irrespective of occupational choice
- Reduce the curricular load and ensure that maximum attention is paid to basic skills in reading, spoken and written communication and computation
- Ensure ICT literacy in the school system
- Provide continuing education and training in relevant areas with special emphasis on ICT

- Establish awareness of ICT and the link with the environment in a sustainable way

4. Develop a national capacity in ICT:

- Incorporate in sectoral plans the ICT requirements to fulfill goals, objectives and targets
- Fostering a culture of research and development in ICT
- Allocate adequate funding for the support of research and development (RD) in ICT
- Identify and prioritise RD in those areas likely to produce benefits given the scarcity of resources
- Optimise the benefit of educational and training
- Develop a well articulated system of ICT training that is broad based, flexible and responsive to the needs of the economy for a skilled workforce
- Recognising and fostering the informal sector for the avenue for the popularisation of ICT
- Encouragement to highly qualified teachers in ICT through incentive schemes
- Establish national information databases and networks

5. Establish a National Council on ICT

- National Council on ICT established by law
- Provision of advice and regulation
- Provision of policy direction
- Co-ordination
- Information gathering and dissemination
- Science popularisation
- Identify areas for R and D
- Sourcing of funds and promotion of R and D
- Linking R and D with the Private sector and the national economy
- Commissioning research of national importance
- Establishment of a separate unit on ICT
- Support for the Caribbean Council for Science and Technology (CCST)

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Appendix D: ACTION PLAN FOR ICT

DATED.....

Targets	Tasks	When	Who	Success Criteria	Monitoring	Cost	Funded by
1. Develop a National Policy on ICT	1.1 Provide Technical Assistance	Sept 2001	PS	Consultant in place & A completion of tasks Plan developed	EPU		
	1.2 Review state of ICT	Oct 2001	Consultant	A Report on the current state of ICT completed	EPU		
	1.3 Agree on Content & Format of National Policy	Nov/Dec 2001	Consultant/ PS	Consensus achieved on Content and Format	EPU		
	1.4 Develop a Policy Framework	Jan 2002	Consultant	Policy Framework developed	EPU		
	1.5 Adopt and disseminate National Policy on ICT	Feb 2002	PS	National Policy approved and disseminated	EPU		
2. Establish National Council on ICT	2.1 Prepare Terms of Reference	March 2002	PS	TOR's prepared	EPU		
	2.2 Determine the Structure of and Resources for the National Council	April 2002	PS	Structure and resources agreed upon	EPU		
	2.3 Seeks Parliamentary Approval to establish National Council on ICT	May 2002	Minister/PS	National Council established by Parliament	Minister/PS		

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ACTION PLAN FOR ICT

DATED.....

Targets	Tasks	When	Who	Success Criteria	Monitoring	Cost	Funded by
3. Implement Measures to ensure that students are competent and proficient in ICT	3.1 Review the state of teaching and learning of ICT	Sept 2002	IT Officer/ EPU/CDU	Review Completed. Report disseminated and used for decision making (Policy and Planning)	ACEO (P&D)		
	3.2 Design appropriate Curriculum, Upgrade facilities and equipment, train and retrain teachers to strengthen the teaching and learning of ICT (as articulated in the National Curriculum)	Jan 2003	IT Officer/ CDU/EPU	Students are competent and proficient in ST	ACEO (PD) CDU/EPU ascertained by Progress Reports, Report Cards and Exam results		
4. Develop a National Capacity in ICT	4.1 Prepare a Comprehensive ICT Plan for Sustainable National Development	2004	National Council on ST	An Integrated Master Plan informing decisions in the use of ST	Minister/PS Evidenced by Central Statistics Report		
5. Establish co-operation with the Caribbean Council for Science and Technology (CCST)	Co-operate with CCST in Technical & Functional linkages	June 2002	National Council	Co-operation established	Minister/PS evidenced by formal agreements		