THE MINISTRY OF EDUCATION
of the Republic of Trinidad and Tobago

DRAFT POLICY

FOR

INFORMATION

AND

COMMUNICATIONS TECHNOLOGY

IN

EDUCATION

excellence

in Education!

30th September, 2005

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FOREWORD

ICT, Information and Communications Technology, has become the buzz word of the 21st Century. Information and Communications Technology is now the driver of knowledge societies. Governments world wide have recognized the need to advantage their citizenry by investing heavily in the development of knowledge based societies, recognizing the decided advantage that the integration and use of ICT provides in the social and economic development of their populations. Governments around the world are therefore formulating and implementing economic policies while establishing efficient and effective IT infrastructure that would facilitate decision-making and strategic management processes. Trinidad and Tobago is no exception

The Ministry of Education recognizes that the use of Information and Communications Technology is critical to the transformation of the society to ultimately meet the universal requirements of an ever changing global environment. It considers ICT as a means not an end in itself.

ICT, in addition to reducing perennial concerns about equity and access is now the vehicle for new and faster ways of delivering and accessing information, for instant communication, for developing new ways to do business, for creating jobs, reducing the digital divide and in providing educational opportunities for all.

ICT in education would enhance human capacity, dynamize the teaching/learning environment, and in addition to providing equity and access would create an environment that encourages creativity, critical thinking, and decision-making thus developing an individual capable of finding his place in a technologically driven skills-based economy.

The pervasive use of ICT in education would also optimize the operations and the management of the Ministry of Education in providing the highest quality of service to the citizens of Trinidad and Tobago.

This ICT in education policy therefore is underpinned by the Ministry's vision "to be the premier institution leading and transforming education through Information and Communications Technology" and is intended to provide the framework for the integration of ICT throughout the Ministry of Education. The policy falls within a

broader environmental context of the education system and considers elements that deal with ICT in schools, in the wider community, ICT services and supports and ICT opportunities and impacts to name a few. The policy finds consonance with the National ICT policy, has built in flexibility and future thinking elements to accommodate advances in the use of ICT.

This policy is one step in charting our path towards developed nation status by 2020

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Senator Hazel A. Manning

Minister of Education

EXECUTIVE SUMMARY

The desire to develop an ICT in Education Policy started in 2004 with the establishment of a Ministry of Education NICT/e-Government team whose remit included planning and managing the Ministry of Education's involvement in the roll-out of the Government's NICT Plan. The document is an attempt to outline issues related to ICT in Education in the context of the Education system's obligation to deliver on public expectation of quality education for economic growth and social development.

This ICT in Education Policy Document is based on the national priorities outlined in the Vision 2020 document which seek to ensure that Trinidad and Tobago is prepared to fully participate in the global information society and to reap the rewards of this participation. In addressing policy issues, the focus is on all sectors and stakeholders of the Education system.

This Policy Document is the product of laborious, tedious and intellectually stimulating conversations commencing in 2004. It is the outcome of a number of individuals conversing with a plethora of documents, cauldron of ideas and varied views and opinions.

Essentially, this Policy Document points to the fact that to achieve First World Developed Nation Status, our nation's children must assume a critical role in this transformation. Accordingly this Document provides a framework for empowerment our major stakeholders with (ICT) Information Communication Technology that would help facilitate Vision 2020.Imbedded are Guidelines and Procedures for the procurement and establishment of various systems.

Networking, establishing partnerships and strategic alliances, implementation and execution scheduler, timely release of money, quality

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training, building essential infrastructure and having champions and gate keepers, would help in the development of a children's and nation's stock of human and social capital.

This Document points the way towards developing our students into critical thinkers, problem solvers and life long learners using ICT as the tool/vehicle.

As our Ministry Of Education becomes more student-centered and ICT driven, we know that greater use would be made of the global currency of information –a small step in the reform process but a giant leap in the delivery of quality education.

1.0 INTRODUCTION

1.1 Policy Background

The ultimate goal of education is to transform society. The Government of Trinidad and Tobago through Vision 2020 is seeking to transform the country to developed country status by 2020 and has prioritized the national objectives as:

- High level of human development and standard of living;
- Full participation of citizens;
- Strong and resilient economy;
- Good effective governance;
- Social cohesion;
- Preservation of the natural environment; and
- Efficient and effective social institutional structures.

The Ministry of Education in its effort to assist the nation to reach developed country status by 2020 has incorporated the United Nations (UN) Millennium Goals and Education For All (EFA) Goals in many of its projects and programmes. At the core is the development of the country's human capital, which is being prepared to compete in a highly global economy.

The Millennium Development Goals and targets, which the Ministry of Education seeks to achieve, are:

- Universal primary education:- the target is to ensure that by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling.
- The promotion of gender equality and empowerment of women as well as men:- the target is to eliminate gender disparity in primary and secondary education preferably by 2010, and in all levels of education no later than 2015.

The Ministry of Education recognizes that the use of Information and Communications Technology (ICT) is critical to the transformation of the society to ultimately meet the universal requirements of an ever-changing global environment.

Developments in ICT have influenced the way citizens live, interact and conduct business generally. Governments around the world are formulating and implementing economic policies while establishing efficient and effective ICT infrastructure that would facilitate decision-making and strategic management processes.

Rapid global, technological and economic developments have placed greater demands on the education system, particularly on the need to inculcate among students the importance of lifelong learning, that is, to constantly seek new information, to think critically and to take initiatives and cope with the challenges of our fast-changing world.

There is and continues to be on-going research around the world on the role and impact of ICTs on social and economic development especially its use in the education sector, amongst underdeveloped and developing countries. This research is currently informing the way in which countries develop policies relating to the use of Information and Communications Technology. Trinidad and Tobago, in the development of its policy on ICT in education, has taken on board the lessons learnt through the research and acknowledges that its ICT in Education policy must be situated within the following framework[1]:

- Broader Environmental Context
- Policy and Regulatory Environment
- Management and Financing
- ICT In Schools- Policy Vision and Strategy
- Technology Infrastructure and Connectivity

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[1] Integrating ICTs into Education: ICT lessons learned series 2004- A Collective Study of Six Asian Countries

- Curriculum, Pedagogy and Content Development
- Professional Development.

Research also indicates there are key issues to be addressed in the development of an ICT in education policy specifically with respect to ICT in schools. They are as follows[2]:

- Preparing all sectors of the education system to understand the investment in and value of technology
- Preparing schools to accept the technology
- Procuring and installing the technology
- Training teachers to use ICT
- Developing and managing content
- Planning for continuous evaluation and research
- Integrating curriculum
- Providing ongoing technical support
- Providing ongoing curriculum support
- Developing partnerships.

The impact of ICT has to do with how equitably and objectively it enables access to an almost infinite resource of information and learning. Where proper provisions are made for equal access to commonly used tools, children, regardless of their social or economic background, can use this technology for learning – on a level playing field. Further, access to this information is completely interactive, so information can easily be re-authored, manipulated and processed to create new knowledge and new artifacts.

Current ICT can reach more students and is more interactive than any previous technology used for learning. Because of its high potential for collaboration, interaction and participation, ICT is also more student-centred than previous learning technologies – even while maintaining teacher mediation. These enhancements have expanded the learning environment of schools beyond the bounds of the school, school time and classroom thus making learning resources available in and out of schools.

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[2] ICT in Education Policy: Reflecting on Key Issues- Vis Naidoo (2003)- Education Specialist, Commonwealth of Learning

ICT has therefore become the technology of choice for human capital development at all levels.

Parallel to the increasing use of the Internet technology in the region, is the continued rapid development of ICT applications. ICT can assist in expanding services such as distance education which will provide educational opportunities to all sections of the society that would normally have limited access to it. It is in this context that the Ministry of Education in Trinidad and Tobago expects to accomplish its mission to be a pacesetter in the holistic development of the individual through an education system which enables meaningful contributions within the global context.

1.2   Philosophy for ICT

This policy is informed by the Ministry of Education's philosophy on Education (as outlined in the White Paper in Education 1993 – 2003) which states inter alia that:

  i.   "Every child has an inherent right to an education which will enhance the development of maximum capability regardless of gender, ethnic, economic, social or religious background";
  ii. "This right to education pertains to all children regardless of location, physical or mental ability".

With respect to ICT, the Ministry of Education's philosophy is that:
  i.   The use of ICT in education would enhance human capacity, dynamize the teaching/learning environment, provide equity and access and develop a responsible individual capable of functioning in a technology driven knowledge-based society;
  ii. ICT in education would:
       a)   Create an environment that encourages creativity, innovation, critical thinking and decision making;
       b)   Promote the kind of collaboration that is required in a knowledge-based society;

c) Enhance teacher skills and abilities;

d) Facilitate the development of partnerships between schools, communities and other public and private sector organizations;

e) Optimise the operations and the management of the Ministry of Education in providing the highest quality service to the nation

iii. 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;

iv. ICT must be exploited to allow students greater control over their learning so that they can develop skills at their own level and speed;

v. The implementation and sustenance of ICT projects in the education system will be a partnership approach involving the community, private and public organizations and funding agencies.

1.3 The Ministry's Vision and Mission for ICT Integration

Vision

To be the premier institution leading and transforming education through Information and Communications Technology.

Mission

To establish a technology centred infrastructure focused on enabling the education system to be responsive to the dynamic social and economic environment.

1.4   Definition of ICT

For the purpose of this policy, ICT covers all the technologies used for the handling and communication of information and their use, specifically in education. These technologies include computers, audio visual systems, broadcast receiving and telecommunication systems, compact discs and videodiscs, microcomputer-based laboratories, the Internet, virtual learning centres, local and wide area networks (wired and wireless), instructional software, print media, educational television, voice mail, e-mail, satellite communication, VCRs, cable television, conventional and interactive radio.

ICTs constitute one fundamental component of complementing and enriching traditional educational institutions, educational delivery systems, and instructional materials. In this sense, ICT contributes to the whole system of knowledge dispersal and effective learning.

1.5   Purpose of the Policy

The purpose of this policy is to establish a regulatory framework and guide for directing the use of ICT as the vehicle for transforming our education system so that individuals can compete in the highly globalised economy.

1.6   Scope of the Policy

The scope of this policy governs the use of ICT in the operation and management of the business of the Ministry of Education supported by implementation strategies, and procedures, standards and guidelines that will deliver ICT to educational institutions within the remit of the MOE.

1.7   Policy Goals and Objectives

The ICT Policy goals and objectives of the Ministry of Education are to:

i.   Achieve continuous alignment with the Ministry's general goals for education and the National ICT policy;

ii.   Ensure all stakeholders possess the critical requisite skills and competencies to use ICT in the education system as a tool to enhance learning and teaching, communication and research, and to generate innovative processes;

iii.   Ensure the establishment of an efficient ICT environment that provides for collaboration, the sharing of education resources and stakeholder participation and allows for open access to national and international networks;

iv.   Inform the framework for the establishment and operations of the Education Management Information System (EMIS) so as to ensure the effective management of the education system;

v.   Encourage innovative models of ICT use such as:
- teacher education;
- teaching;
- learning; and
- curriculum materials development

vi.   Harmonize activities, approaches and standards in the use of ICT within the Education System

vii.   Achieve administrative and management excellence in education through the establishment of ICT as the major business operations platform of the Ministry;

viii.   Encourage critical and creative thinking, lifelong learning and social responsibility;

ix.   Establish a regulatory framework for ICT issues in education;

x.   Ensure that quality ICT education provided by private institutions are aligned with the Ministry's standards for ICT;

xi.   Point to the establishment of an ICT organization at the highest level to continuously promote and foster ICT industry.

1.8   Target Audience

This policy affects:

    i.   MOE employees – teachers, civil servants and other public officers

    ii.   Students

    iii.   School administrators

    iv.   Parents

    v.   ICT personnel

    vi.   School boards

    vii.   NGOs

    viii.   FBOs

    ix.   MOE suppliers

    x.   MOE consultants

    xi.   Partners in education

    xii.   Other relevant government agencies

2.0   A FRAMEWORK FOR POLICY MANAGEMENT AND IMPLEMENTATION

2.1 ICT Executive Committee

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2.1.1. An ICT Executive Committee consisting of members appointed by the Minister of Education shall manage this policy.

2.1.2. The role of the ICT Executive Committee shall be to:

    i.   Approve or reject recommendations made by the ICT Task Force

ii. Publish performance measures and guidance documents to address levels of development of appropriate ICT for Education, distribution and delivery of ICT, maintenance and support of ICT, ICT literacy, and ICT integration;

iii. Set priorities using an ICT investment decision model;

iv. Publish performance measures to indicate:

   a) Levels of basic ICT Literacy for all students enrolled in MOE programmes

   b) Levels of confidence in using ICT amongst education staff

   c) Levels of access to ICT resources by students

   d) Levels of access to ICT resources by teachers (broken down by education level at which they teach)

   e) Usage of ICT to support teaching and learning (broken down by curriculum)

v. Ensure that each education site is regularly graded and assigned an ICT development level and has defined performance measures in place;

vi. Report annually on the Policy.

2.1.3. The ICT Executive Committee shall report to the Minister of Education.

2.2 ICT Task Force

A dedicated task force shall be established to coordinate the implementation of this Policy.

2.2.1. The Task Force shall have representation from the Ministry of Education Executive, the Education District Offices, Departments with central roles in teacher training, curriculum development, distance education, technology, school management and administration, and other ministries and departments with education related ICT capacities.

2.2.2. The role of the Task Force shall be to:

i. Establish an efficient framework for co-operation amongst line ministries, educational institutions, stakeholders and partners to ensure the successful implementation of ICT in Education in Trinidad and Tobago;

ii. Identify and recommend ICT investment decision models. Consideration will be given to factors such as inclusion, lifelong learning and seamlessness;

iii. Make recommendations to the Executive Committee with regard to mutually agreed standards of acceptance, cost and quality of operations, services, support and maintenance, teacher and staff training, institutional development, capacity building, research, and public awareness within the ICT Policy Framework;

iv. Coordinate the implementation of national, regional and international ICT in Education initiatives;

v. Identify and recommend open standards and maintain an approved list of these standards which shall make provision for platform neutrality, content diversity, vendor independence, functionality, and ICT competency value for the education community. All donors and private/civil partnerships serving the ICT development requirements of the education sector shall be expected to follow these standards.

vi. Identify and recommend ICT best practice guidelines for the Ministry of Education and maintain a database of such guidelines.

2.2.3. The ICT Task Force shall report to the ICT Executive Committee.

3.0 READYING THE ENVIRONMENT

3.1   Developmental Levels

3.1.1. In order to address the goals of this policy and measure progress in the implementation of ICT in education, a series of specific development levels are required. These levels are described below:

3.1.1.1 **Level 1**

a) The school is capable of accommodating up to sixteen (16) computers inclusive of that for use by the resource personnel. The site has audiovisual and broadcast facilities.

b) The technologies are used for teaching ICT skills such as basic computer use, learning how to use a word processor, introduction to the Internet and sourcing information.

c) The staff has the skills to retrieve information, prepare documents, use school management software, and engage in professional development activities.

d) At least one member of staff possesses a minimum basic ICT Literacy qualification.

e) Students spend at least one hour a month using computers and the audiovisual and broadcast facilities.

3.1.1.2 **Level 2**

a) All Level 1 attributes apply.

b) In addition, the school is connected to the Internet, and is equipped with a mobile computer and projector system and other technologies.

c) Students and teachers have access to audiovisual equipment in the classroom, library or the technology/media room, and use the Internet and e-mail.

d) Learning resources are downloaded for instruction and occasionally created by teaching staff.

e) Significant communication with the Ministry is done via e-mail and web services.

f) At least two of the site staff have professional ICT certification.

g) Students spend at least one hour every two weeks interacting with the computer and other ICT related technologies.

3.1.1.3 **Level 3**

a) ICT is significantly integrated into the teaching and learning process.

b) The school has two or more classrooms equipped with computer and projector systems and other audiovisual equipment and materials. The school has Internet connectivity with adequate bandwidth.

c) ICTs are available for classroom use by students and teachers. All students are able to use a computer, communicate by e-mail, find information using web-based systems, and create output using a word processor.

d) Learning materials are downloaded, created, and uploaded by teaching staff. Computer based training materials are being used to support teaching.

e) Over one third of communication with the Ministry is done via e-mail and web services.

f) Thirty percent (30%) of staff have professional ICT certification.

g) Students spend at least two hours each week interacting with the computer and other ICT related technologies.

3.1.1.4 **Level 4**

a) At this level ICT is fully integrated into the teaching and learning process.

b) The school has fifty percent (50%) of its classrooms equipped with computer and projector systems and other audiovisual equipment and materials.

c) The school has Internet connectivity with adequate bandwidth.

d) Computers are available for use by students at a ratio of one (1) to seven (7) and teachers at the ratio of one (1) to one (1).

e) All students are able to use a computer, communicate by e-mail, find information using web-based systems, create output using a word processor, spreadsheet and presentation software.

f) Learning materials are downloaded for instruction, created, and uploaded by teaching staff.

g) Computer based training materials are used to support teaching.

h) Software is available to allow student to experiment and investigate.

i)   Seventy five percent (75%) of staff have professional ICT certification.

j)   Students spend at least one hour each day interacting with the computer and other ICT related technologies.

3.1.1.5 **Level 5**

a)   This level applies to an educational facility with an ICT focus.

b)   The school has one hundred percent (100%) of its classrooms equipped with computer and projector systems and other audiovisual equipment and materials.

c)   The school has Internet connectivity with adequate bandwidth.

d)   Computers are available for use by students at a ratio of one (1) to five (5) and teachers at the ratio of one (1) to one (1).

e)   All students are able to use a computer, communicate by e-mail, find information using web-based systems, create output using a word processor, spreadsheet and presentation software.

f)   Students are trained in programming, database design and usage, system configuration.

g)   Learning materials are downloaded, created, and uploaded by teaching staff.

h)   Computer based training materials are used to support teaching using a blended learning approach.

i) Software is available to allow student to experiment, investigate and create software.

j) Students serve as apprentices in ICT related industries.

k) All teaching staff have professional ICT certification while at least fifty percent (50%) have ICT related work experience.

l) Students spend at least four (4) hours each day interacting with the computer and other ICT related technologies.

3.1.2. The Implementation Plan which accompanies this ICT Policy for Education articulates the activities which will lead to these desired levels. The Implementation Plan will address

i. the development of ICT in education;
ii. the deployment and delivery of ICT across the education sector;
iii. the required maintenance and support of ICT;
iv. ICT literacy; and
v. ICT integration.

3.2   Priorities

3.2.1. Progressive improvements in the business of education will take time, even with ample resources. As such, ICT initiatives are to be ordered to develop and maintain an efficient administration, high achieving students and effective schools.

3.2.2. Implementation of initiatives must show no district bias and will be based on the proportion of students per district.

3.2.3. An ICT investment decision model will guide the Ministry of Education and its partners in selecting priority areas. The model's operation will be developed,

evaluated, maintained and used. The model's operation will be transparent and open to public scrutiny and review.

3.3   Performance Measures and ICT Literacy Qualification

Measurement of performance is a prerequisite for the efficient and effective management of outcomes, delivery methods, and relevance of implementation of this policy. It also increases the confidence of many external partners so facilitating the building of such partnerships and improving access to resources beyond that of the government of Trinidad and Tobago.

3.3.1.   Performance measures shall be published by the ICT Executive Committee.

3.3.2.   The Ministry of Education and its partners shall maintain an ICT Literacy curriculum and standards which may be freely applied in Trinidad and Tobago. The aim of this qualification is to provide an ICT competency benchmark for all students and the national workforce to achieve and exceed.

3.3.3.   Although the objective of ICT in the classroom is improved teaching and learning, acquiring ICT competency levels shall be encouraged as part of the process. This applies to both teachers and students, although from different perspectives. For teachers this shall relate more to the use of ICT as a resource, and integration of ICT across the curriculum.

3.3.4.   For students, basic ICT competencies shall be acquired, and assessed, as a by-product of classroom / subject use. This point will need to be embraced at each level of teacher development, with the importance and value of ICTs in education supported at all levels.

3.4   Standards

At the core of the MOE's thrust in ICT should be the question of cost effectiveness and the ability to employ best practices.

3.4.1. There is a need for standards for ICT used to deliver the policy. An approved list of open standards shall also be identified and maintained.

3.4.2. These standards shall make provision for platform neutrality, content diversity, vendor independence, functionality, and ICT competency value for the education community.

3.4.3. It shall encourage cost-effective ICT implementation.

3.4.4. ICT adopted by the MOE shall conform to both industry and/or open standards.

3.4.5. Ownership and development of ICT must be encouraged, and such locally developed ICT should ideally, but not exclusively, be licensed under regimes that include Creative Commons or similar licensing arrangements.

3.4.6. All donors and private/civil partnerships serving the ICT development requirements of the education sector shall be expected to follow these standards.

3.5   Financing and Sustainability

3.5.1. Budgets for the financing of hardware and software shall be computed for the total cost of ownership (TCO) in present value dollars. Elements contributing to TCO include:

    i.   Acquisition of hardware and software;

    ii.   Installation and configuration;

    iii.   Connectivity;

    iv.   Maintenance and other operational costs;

    v.   Support and training;

    vi.   Retrofitting of physical facilities; and

    vii.   Replacement costs (in three year depreciation cycles).

3.5.2. The overall aim of funding shall be to allocate the necessary funds to enable this initiative to succeed.

4.0 ICT IN SCHOOLS

The primary goal of ICT in education in Trinidad and Tobago is to create an educational system in which students leave schools as confident, creative and productive users of new technologies, including information and communication technologies, and understand the impact of those technologies on society.

The Ministry shall implement mechanisms so that learners are able to develop skills in using ICT as early as feasible, so that they can continue to use technologies for lifelong learning.

4.1. Planning for ICT

Recognising that many schools have integrated ICT in school administration systems, and have taken steps toward building capacities for ICT competency, literacy and curriculum content, this policy encourages;

i.   the planning for ICT by all schools in Trinidad and Tobago, within the framework of MOE's strategic plans and related guiding documents.

4.2. Management Systems

4.2.1. ICT can be powerful in driving and managing new approaches to learning that involve more student interaction, more connections among schools, more collaboration among teachers and students, and more involvement by teachers as facilitators, thus facilitating self-study, distance education and e-learning. Education management and information systems must be:

i)   compliant with established information management principles, and enable migration and long-term preservation of the information and data.

ii)   compatible with international standards and data export interfaces.

4.2.2   An open management standard shall be identified and used by all institutions.

4.2.3   Institutions shall use open management systems to facilitate ease of access to data and efficient training. The following areas are required:

a.   ***Communication*** - The communication system shall make provision for greater collaboration and sharing of knowledge.

b)   ***Finance and Human Resources*** - It is recognized that managers will require summaries of expenditures and need to make decisions on such information. An integrated finance and HR system that allows all stakeholders to see and manipulate their data must be established and maintained. This would allow greater control and oversight for audit, efficiency and best practices purposes.

c)   ***Records Management*** - Archiving of information and continued availability of institutional records is a key factor in keeping MOE operational. ISO-compliant electronic management systems can substantially improve performance, effectiveness and efficiency to ensure that information is preserved for the long-term, and to prevent serious data losses.

4.3   Staff Training

4.3.1. Staff shall be appropriately trained to function at their required ICT competency level.

4.3.2. Staff training shall include pre-service and in-service training as well as post training support.

4.3.3. Staff shall be encouraged and supported in applying knowledge and skills gained in ICT to the learning environment.

4.3.4. The development and innovative use of ICT in schools shall be recognised and rewarded.

4.4 Curriculum Content and Learning Resources

4.4.1. Curriculum and content must increasingly maximize the use of ICT.

4.4.2. ICT must be integrated into the development and delivery of the curriculum.

4.4.3. The ICT curriculum needs to be reviewed frequently in order to maintain its relevance.

4.4.4. ICT integration and ICT competency measures across the curriculum shall be driven through the development and delivery of an ICT-infused curriculum.

4.5 Producing and Managing Digital Content

Digital content creation within the Ministry focuses on the provision of digital resources that are relevant to students and teachers following the Trinidad and Tobago curriculum. This includes the evaluation of products and extends to collaborations with partners to produce resources for key areas of the curriculum.

The Ministry of Education recognizes the importance of locally produced ICT curriculum resources to support education reform in this digital era. As such, digital resources shall play a central role in integrating ICT into the curriculum, developing innovative practices and transforming the way students learn.

4.5.1. To promote more effective use of ICT in the classroom, the MOE shall develop and supply quality digital education resources for teaching, learning and testing.

4.5.2. All digital content shall be relevant to the local curriculum and directed toward

curriculum outcomes;

4.5.2. The MOE shall provide guidelines for the conversion of non-digital content to digital and other multimodal forms.

4.5.3. The MOE shall establish mechanisms for evaluating digital content.

4.5.4. The MOE shall invest in research and development regarding digital content creation.

4.5.5. The MOE shall develop mechanisms for protecting intellectual property rights.

4.5.6. Digital content shall conform to internationally accepted standards.

5. ICT IN THE MINISTRY OF EDUCATION

The pervasive use of ICT in the core business of the MOE has the potential to optimize the operations and the management of the Ministry in providing the highest quality of service.

5.1. Planning for ICT

The Ministry shall:

5.1.1. Create a technology-assisted working environment in which all MOE staff can function with ease.

5.1.2. Foster a work culture whereby MOE staff develop personal expertise by actively pursuing new knowledge and abilities in the area of ICT, applying technology to their work and freely exchanging this knowledge and skills with others.

5.1.3. Establish an efficient ICT infrastructure that provides open access to international and national networks.

5.1.4. Provide specialized support and enhanced infrastructure for advanced planning, administration, research and scholarship.

5.1.5. Enhance the IT environment to enable greater user self-sufficiency at Central, District and school levels.

5.2. Management Systems

Educational administration is aimed at increasing efficiency, which allows for prompt decision-making. Effective and efficient management systems must therefore be implemented.

5.2.1 The MOE shall implement an administrative strategy whereby e-mail is used as the primary form of communication among schools, districts and the MOE.

5.2.2. An Intranet system shall be implemented so as to strengthen the MOE's education management abilities.

5.2.3. An integrated online Educational Management Information System (EMIS) shall be established to expedite access to information resources, to strengthen education management capabilities and facilitate effective decision making within Central Administration

5.2.3. A central helpdesk shall be created to deal with technical difficulties and employee queries.

5.3. Staff Training

5.3.1. All MOE staff shall be afforded basic computer literacy and where possible appropriate training consistent with job requirements.

6.   ICT IN THE WIDER COMMUNITY

6.1 .Lifelong Learning

6.1.1   The Ministry of Education shall develop and implement strategies to ensure the use and integration of ODL in the development and delivery of its lifelong learning programmes. Open and Distance Learning (ODL) refers to more flexible approaches to providing education and training, involving a combination of conventional face-to-face contact and independent study methods, using a variety of media and technology.

6.1.2.   The MOE shall be supportive of public, private, civil society partnerships and make collective use of Ministry ICT and ODL resources.

6.1.3.   ICT and distance education services shall be available to the wider education community.

6.1.4.   All MOE courses and programmes shall be available to nationals in a multimodal format.

6.2. Parents

Parents play a vital role in supporting their children's education. An ICT strategy for education must ensure that parents have some understanding and experience of ICT.

6.2.1.   Special programmes for parents shall be developed and delivered using multimodal formats.

6.3. Special Groups

6.3.1.   Special groups such as the incarcerated, shall have access to all MOE ICT enabled programmes and services.

7. ICT SERVICES AND SUPPORT

The following key areas shall be addressed effectively:

i.   Maintenance and Support of ICT,

ii.   ICT Literacy, and

iii.   ICT Integration.

7.1. ICT Maintenance and Support

7.1.1. A maintenance and support regime must be in place to ensure that all ICT facilities and other resources are available, functional, and secure.

7.1.2. Timely and effective maintenance and support services must be in place to ensure efficient and cost-effective use of ICT.

7.1.3. Support services inclusive of initial and continuous training must be provided for MOE personnel.

7.2. Networking

Networking provides for local area network (LAN) and wide area network (WAN) services, which ensures communication between clients, servers and ultimately between people.

7.2.1. The network shall use technologies that are secure from unsolicited intrusion.

7.2.2. Appropriate security measures for the MOE network system must be in place.

7.2.3. All educational sites shall be connected with the aim of increasing communication, improving efficiency, and widening the sphere of influence and knowledge of the site.

7.2.4   Standards are to be developed and maintained to ensure network availability and security.

7.3. Digital Library

A Digital Library provides materials to support the curriculum, the MOE administration, and the wider education community.

In its quest to develop a knowledge based society, the MOE shall:

7.3.1. institutionalize international best practices regarding knowledge management systems.

7.3.2. establish and maintain a digital library for education consumer to retrieve information.

7.4. **Internet Access**

Internet Access will provide for further content beyond that provided by the digital library. It makes available the vast knowledge and materials on the World Wide Web. Unlike the Digital Library, the quality and relevance of such web content will vary and require careful selection by the user.

7.4.1. The MOE shall provide Ministry wide access to the Internet.

7.4.2. Relevant guidelines, accessibility rights and acceptable use policies shall be established.

7.4.3. Where possible and necessary, the MOE shall provide high speed Internet access to all its institutions.

7.5. **Security and Access**

Digital security must protect educational users, data and information, the ICT infrastructure and resources. Such protection is not just physical; it extends to the digital arena where protection from potentially harmful 'information' such as pornography is required.

7.5.1. The MOE shall provide security mechanisms to authenticate and authorize valid users.

7.5.2. Unauthorized access to MOE's personnel, mission critical (sensitive) and administrative data shall be prevented.

7.5.3. Policies for all ICT services shall be developed and maintained.

7.5.4. Access shall be denied to sites which are deemed harmful to the organization or personnel.

7.5.5. Access by unauthorized external intrusion shall also be denied. Procedures, guidelines and standards shall be developed and maintained to address security breaches. For enforcement these should be linked to teaching and public service regulations, national and international laws.

7.6.6. Systems shall be established to prevent unauthorized data collection

8. ICT OPPORTUNITIES AND IMPACTS

ICT would open new windows of opportunity to all MOE clients.

8.1. Promotion of Healthy Lifestyles

ICT in the classroom offers an opportunity to underpin the national effort to promote healthy lifestyles including the fight against HIV and AIDS. Education has been identified as the most significant vehicle to create an understanding of healthy lifestyles and to mitigate the effects of pandemics such as HIV / AIDS.

8.1.1. The MOE shall provide access to relevant and up-to-date information and services regarding healthy lifestyles including the avoidance of HIV and AIDS.

8.1.2. The MOE shall collaborate with other relevant agencies in providing healthy lifestyles information to its clients.

8.2. Inclusive Education

ICT represents a major opportunity for providing learners an opportunity to develop to their full potential.

8.2.1. ICT shall be used to promote individualized learning in order to reduce disparities in educational development and performance.

8.2.2. The MOE shall institute mechanisms to promote gender-equity through the use of ICT in education

8.2.3. The MOE shall use assistive technologies to support those who are physically and mentally challenged.

8.2.4. ICT shall be used as a mechanism for educating our stakeholders about special education issues.

8.2.5. ICT shall be used in researching, developing, delivering and administering special education programmes and services within the MOE.

8.2.6. ICT shall be used in promoting and providing teacher training in special education.

8.3. Environment

This policy recognises the importance of environmentally appropriate methods of disposal of end-of-life ICT.

8.3.1 The MOE shall adhere to international health and safety standards in all its operations.

8.3.2   The MOE shall adhere to internationally accepted standards for the use and disposal of ICT.

9 RESEARCH, MONITORING AND EVALUATION OF ICT IN ECUATION

9.1. Research, Monitoring and Evaluation Plan

A detailed Research, Monitoring and Evaluation Programme shall be developed, implemented and maintained to measure, evaluate, and research the relevance and impact of this policy.

9.2. Existing and Emerging Technologies

9.2.1. Research in and development of existing and emerging technologies shall be institutionalized within the MOE.

10. PUBLIC, PRIVATE AND CIVIL SOCIETY PARTNERSHIPS

ICT with its networks and multiple partner value chains can never survive in isolation. Indeed, for it to work it must have linkages and partnerships.

The MOE shall forge linkages and partnerships beyond government, to civil society, NGO's, commercial interests and the international community to develop the ICT economy of Trinidad and Tobago.

ACRONYMS

EFA – Education For All
EMIS – Education Management Information System
FBOs- Faith Based Organisations
HR – Human Resources
IT - Information Technology
ICT - Information and Communication Technology
ISO – International Standards Organization
ISP – Internet Service Provider
LAN – Local Area Network
MS - Microsoft Systems
MOE- Ministry of Education
NGOs - Non-Governmental Organizations
NPOs - Non-Profit Organizations
ODL – Open and Distance Learning
PC - Personal Computer
TCO - Total Cost of Ownership
UN – United Nations
VCR – Video Cassette Recorder
WAN – Wide Area Network

GLOSSARY

Assistive technologies - commonly refers to products, devices or equipment, whether acquired commercially, modified or customized, that are used to maintain, increase or improve the functional capabilities of individuals with disabilities.

Audio visual equipment – any equipment which allows for audio and visual presentations

Bandwidth – the capacity of a communication channel. In a digital communication system, it is the rate at which bits or bytes may be transmitted through the system per second.

Blended learning - An increasingly popular combination of online and in-person, classroom learning activities.

Broadcast facilities - Facilities that transmit messages or video to a large number of receiving locations simultaneously.

Civil Society - Non-governmental, non-public, non-profit making organisations, networks and voluntary associations. It includes most NGOs.

Computer Based Training - Course or educational material presented on a computer, primarily via CD-ROM or floppy disk. Unlike Web based training, computer based training typically does not require that the computer be connected to a network and typically does not provide links to learning resources outside of the course.

Connectivity: The ability to connect computer or communications systems to exchange data or share resources; the ability to access the Internet and utilize online resources.

Compact disks: Also known as CDs. A non-magnetic, polished, optical disk used to store large amounts of digital information.

Creative Commons: An organization that has defined an alternative to copyrights by filling in the gap between full copyright, in which no use is permitted without permission, and public domain, where permission is not required at all. Creative Commons' licenses let people copy and distribute the work under specific conditions, and general descriptions, legal clauses and HTML tags for search engines are provided for several license options.

Database - A database is a collection of data, typically organized to make common retrievals easy and efficient. Some common database programs include Oracle, Sybase, Postgres, Informix, Filemaker, Adabas, etc.

Digital library: A digital library is a collection of documents in organized electronic form, available on the Internet or on CD-ROM (compact-disk read-only memory) disks. Depending on the specific library, a user may be able to access magazine articles, books, papers, images, sound files, and videos. On the Internet, the use of a digital library is enhanced by a broadband connection such as cable modem or DSL.

Distance Education - A formal learning activity which occurs when students and instructor are separated by geographic distance or by time, often supported by communications technology such as television, videotape, computers, email, mail, or interactive videoconferencing.

Download The transfer a file or files from a remote computer to the user's computer

E-Learning - learning facilitated and supported through the use of information and communications technology.   E-learning can cover a spectrum of activities from supported learning, to blended learning (the combination of traditional and e-learning practices), to learning that is entirely online. Often referred to as Education using electronic delivery methods such as CD-ROMs, video conferencing, websites and e-mail. Often used in distance-learning programmes.

E-mail: E-mail is short for electronic mail. It allows for the transfer of information from one computer to another, provided that they are hooked up via some sort of network (often the Internet. E-mail works similarly to FAXing, but its contents typically get printed out on the other end only on demand, not immediately and automatically as with FAX.

EMIS Education Management Information System

Global Economy - a term for the fact that the economies of most of the world's nations have become increasingly interconnected; the expansion of economies beyond national borders, in particular, the expansion of production by transnational corporations to many countries around the world. The global economy includes the globalization of production, markets, finance, communications, and the labor force.

Industry standards - are proprietary standards which are widely accepted due to market acceptance. For example, Microsoft Windows. Industry standards provide a compromise between open and proprietary standards, with its integration and faster product development. Nonetheless, they are still proprietary, and organizations using them could still depend on vendor. It is also considered as a uniform identification that

is agreed on, uniform identifications for definite characteristics of quality, design, performance, quantity, service, etc

Information and Communication Technology (ICT): These technologies include computers, audio visual systems, broadcast receiving and telecommunication systems, compact discs and videodiscs, microcomputer-based laboratories, the Internet, virtual learning centres, local and wide area networks (wired and wireless), instructional

software, print media, educational television, voice mail, e-mail, satellite communication, VCRs, cable television, conventional and interactive radio. It represents the convergence of information technology (IT) and communication technology (CT). ICTs are the combination of networks, hardware and software as well as the means of communication, collaboration and engagement that enable the processing, management and exchange of data, information and knowledge.

Interactive radio – radio programmes in which interactivity is characterized by a conversation between the radio teacher and the students. This conversation includeds a simulated dialogue between the radio teacher and students in which students respond, in chorus , to questions posed by the teacher. Today interactive radio instruction has expanded and adapted to include a broader definition of interactivity, one that not only engages students in conversation but promotes more active learning.

Internet - The Internet is the world-wide network of computers. There is only one Internet, and thus it is typically capitalized (although it is sometimes referred to as "the 'net"). It is different from an intranet.

Knowledge Based Society

Lifelong Learning - A continuum of the learning process that takes place at all levels - formal, non-formal and informal - utilizing various modalities such as distance learning and conventional learning. It refers to learning that occurs throughout one's lifetime.

Local Area Network (LAN) - Communications network connecting computers by wire, cable, fiber optics link or wireless. Usually serves parts of an organization located close to one another, generally in the same building or within 2 miles of one another. Allows users to share software, hardware and data.

Network - A computer network is a group of computers that are linked so that information can travel between the computers. The computers could be in the same room and linked via copper cables, or located in different countries, linked by satellites, phone lines or fibre optic cables. The Internet is one of the world's largest networks. Wireless networks transmit information over public airwaves (the same used by television, radio, and cell phones).

Open and Distance Learning- flexible approaches to providing education and training, involving a combination of conventional face-to-face contact and independent study methods, using a variety of media and technology.

Open Standards - Standards with publicly available specifications, which can be implemented by any developer. Open standards are typically developed and maintained by a review process in which all interested parties may participate, in contrast to proprietary standards, which are developed and maintained by a single company.

Pedagogy The strategies, techniques, and approaches that teachers can use to facilitate learning.

Platform neutrality A platform would typically be defined as a hardware and operating system combination. Platform neutrality refers to programmes that can run on various operating systems without modification.

Programming The creation of a set of instructions that tells a computer what to do.

Projection system Display that projects image onto a screen

Satellite communication Data communications via satellite

Software Written coded commands that tell a computer what tasks to perform

Spreadsheet: A program used to perform various calculations. A common spreadsheet is Microsoft Excel

Server A computer that delivers information and software to other computers linked by a network.

Telecommunication system communication system for communicating at a distance

Total Cost of Ownership - The life cycle cost view of an asset, which includes acquisition, setup, support, ongoing maintenance, service and all operating expenses. It focuses attention on the sum of all costs of owning an asset, as opposed to the initial or vendor cost, and is useful in outsourcing decisions.

Upload To transfer a file from a desktop computer onto a web server or another computer

Video discs A double-sided optical disc that has the same overall dimensions of a CD, but has significantly higher capacities. Also known as digital video discs (DVD)

Virtual learning Centres An electronic learning community that facilitates communication, information sharing and learning opportunities through the use of electronic tools such as videoconferencing, the Internet, chat rooms, etc.

Voice mail A computerized telephone answering system that digitizes incoming voice messages and stores them on disk or flash memory.

Wide Area Network WANs are networks that span the distance between buildings, cities and even countries. WANs are LANs connected together using wide area network services from telecommunications carriers and typically use technologies such as standard phone lines (called POTS (Plain Old Telephone Service) or PSTN (Public Switched Telephone Network)), ISDN (Integrated Services Digital Network), Frame Relay, ATM (Asynchronous Transfer Mode) or other high speed services.

Wireless networks A network protocol that enables online content to be viewed via wireless devices, such as cell phones, laptop computers, and handhelds.

Word Processor: a computer application used for the production of any sort of viewable or printed material.

World Wide Web: The **W**orld-**W**ide-**W**eb refers to all the publicly accessible documents on the Internet. It is also sometimes just referred to as "the web".

APPENDIX A: List of Contributors

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