The State of Eritrea

Ministry of Education

National Policy

for

ICT in Education in Eritrea

July 2005

In telecommunications, the extension of mobile telephone services is growing rapidly. Its importance and utility is illustrated by growing demand. Expansion of fixed and mobile telephone services coupled with narrow and broadband Internet access through satellite linkup, which is principally aimed at enhancing information services for education and students, are additional communications projects the government is pursuing vigorously.

Remarks by H.E. Isaias Afewerki, President of the State of Eritrea, on the occasion of the 14th Independence Day Anniversary, May 24, 2005

List of Acronyms

AME – Department of Adult and Media Education
AUP – Acceptable Use Policy
DGE – Department of General Education
DVD – Digital Video Disks
EMIS – Educational Management of Information Systems
ESDP – Education Sector Development Project
FM – Frequency Modulation
FOSS – Free Open Source Software
HIV/AIDS – Human Immunodeficiency Virus / Acquired Immunodeficiency
     Syndrome
ICT – Information and Communication Technology
ISP – Internet Service Provider
LAN – Local Area Network
M&E – Monitoring and Evaluation
MoE – Ministry of Education
NUP – Network Use Policy
PMU – Project Management Unit
POP – Point of Presence
R&D – Research and Development
RHRD – Department of Research and Human Resource Development
SIE – Society of Innovative Educators
TEVT – Department of Technical Education and Vocational Training
UNESCO – United Nations Educational, Scientific, and Cultural Organization
VSAT – Very Small Aperture Terminals
WAN – Wide Area Network

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1 Introduction

1.1 Background

The Government of Eritrea recognizes that globalization is a reality, and that Eritrea must develop the capacity to compete in a global market if she is to realize economic, social, and cultural prosperity. Two essential elements for realizing this vision are creating the human capacity and the technological infrastructure to meet the needs of a global market.

Information and communication technologies (ICT) are tools that have overarching implications on all aspects of government and society. ICT tools include television, analog and cellular telephone, radio, audio/video cassette recorders, DVD players, computers, networks, email, the Internet, productivity software, video camera microscopes, and other media and technical innovations. ICT tools help to access, organize, process, and present information clearly and efficiently. ICT has the potential to enhance and transform how government and the entire economic sectors are run. ICT can make a significant impact on demand responsiveness for human and other capacity resources. With appropriate and thoughtful application of ICT tools, and parallel human resource development, the entire public and private sector can operate more efficiently and more cost effectively.

ICT has brought the world into a new knowledge and information age. The implications of ICT on the education sector are broad and complex. Educators must understand that ICT is a *catalyst* for transformation, and should not be approached as an end in itself, but as one *element* in the broader spectrum of education reform.

The Education Sector is universally recognized as the foundation of any country's human resource development. The Ministry of Education of Eritrea has embarked on an ambitious, sector-wide reform program in support of the Government vision. ICT is an essential element in education reform, and this National Policy for ICT in Education is the framework by which the Ministry will move forward to invest the necessary resources to meet the needs of the education sector and the country.

The development of the knowledge, skills, attitudes and actions facilitated by the infusion of ICT in the education sector will have long-lasting benefits for citizens and the economic sector in general. Team-work and process skills developed through this infusion will open doors of opportunities for the citizens of Eritrea. ICT provides a gateway to world of information that will provide new, affordable, life-long learning opportunities important in responding to a changing world.

The National Curriculum of Eritrea is currently being reformed to broaden student learning outcomes to include process and life-long learning skills. The MoE seeks to integrate student-centered activities that provide the opportunity for students to become more actively involved in their learning and develop the social and process skills essential for successful employment in the workplace. The pedagogical consideration for this new teaching paradigm substantially departs from traditional methodologies, and will require teachers to develop new teaching and management skills. The integration of ICT as a teaching and learning tool will help to create a

context for new teaching methodologies, helping to illuminate for teachers how the new pedagogy is supported by ICT.

The National Policy for ICT in Education reviews the context of education in Eritrea with a brief overview of the reform process. It provides a rationale and objective to the introduction of ICT in the education sector, and outlines the defining principles of education in Eritrea, and the visions of Government and the Ministry of Education.

The National Policy for ICT in Education covers Government and Education Sector considerations, giving brief rationales and objectives, followed by the policy statements. The Strategy for ICT in Education assumes a broad approach to "high-level" considerations that may apply to all sub-sectors of education. Included is a Strategy for Implementation which makes recommendations for The Office of the Minister, and each Department on how to move forward.

The Policy serves to direct the Ministry of Education in establishing a well-planned integration of ICT into its operations and schools. It seeks to raise awareness of the essential elements important in this process. The Policy is brief, and is shaped by the context of Eritrea, best practices of similar projects, and the vision and need of many stakeholders in education. The Policy intends to address all aspects of the education sector.

1.2 Vision for ICT in Eritrea

1.2.1 Global Commitment

- Eritrea will enter the global information age and be economically competitive.
- Eritrea is committed to a sector-wide capacity development that is vitally linked to appropriate and efficient applications of ICT, in order to narrow the "digital divide."

1.2.2 Millennium Development Goals

- Eritrea fully embraces the Goals of the Millennium affirmed by the United Nations and that ICT plays an integral part of the process in meeting these goals. The goals are: to 1) eradicate poverty and hunger, 2) universal primary education for all, 3) promote gender equality and empower women, 4) reduce child mortality, 5) combat HIV/AIDS, 6) ensure environmental sustainability, 7) develop a global partnership for development, and 8) improve maternal health.

1.2.3 Access & Basic ICT Literacy

- The Government of Eritrea envisions all citizens, regardless of their origin, language, gender, or geographic location, will have access to information and communication technology, and will attain at minimum a basic ICT literacy level within their lifetime.

1.2.4 ICT as an Economic Industry

- The development of a sustainable ICT industry that is capable of competing in the global market.

1.3 Vision for ICT in Education

1.3.1 ICT as a Teaching and Learning Tool

- ICT in education as a key contributor to improving the quality of education in Eritrea, and engendering life-long learning skills, such as information processing, critical thinking, and problem solving.
- ICT will be integrated both vertically and horizontally throughout the educational provision of Eritrea.
- Human capacity and infrastructure will be developed to support this institutional deployment to ensure all stakeholders in the education sector have basic ICT literacy skills, and are appropriately trained to respond to pedagogical and managerial needs.
- The Ministry of Education will actively develop multimedia materials and other media related tools for the purposes of teaching and learning
- The provision of ICT as a teaching and learning tool in the education sector will include radio, audio cassette recorders, video cassette recorders, DVD players and recorders, television, analog and cellular telephones, computers, satellite downlink and uplink technology, the Internet, and other digital technologies.

1.3.2 ICT for Management of Information

- ICT will be an essential and fundamental component for capacity development in all education sub-sectors.
- ICT infrastructure and interconnected network will be procured and installed throughout the entire administration sector of education, and utilized to its fullest extent for a more efficient management of information.
- A comprehensive network use policy and training program will be developed and deployed to ensure all employees in the sector use the network competently and safely.

1.3.3 ICT for Human Resource Development

- ICT will be utilized to support training and continued professional development of teachers, management and operations staff, and the public at large.

1.4 Policy Context

The National ICT in Education Policy for Eritrea is underpinned by a number of existing policy documents.

1.4.1 Macro-Policy – 1994

The Government of the State of Eritrea affirmed the vision of the Nation through its Macro-Policy published in November, 1994. The Macro-Policy establishes the foundational vision of development in Eritrea for all sectors of the country, public and private. All subsequent policy has emerged from the vision of the Macro-Policy, including the "Concept Paper for a Rapid Transformation of the Eritrean Educational System" published in July, 2002, and the National Education Policy (Draft), published February, 2003. Some aspects of the Macro-Policy that have provided a foundation for the National ICT in Education Policy are:

National Development Objectives:
- An upgraded and technologically improved informal sector.
- Broad-based education incorporating widespread dissemination of skills and languages and extensive human capital formation

Manufacturing:
- Develop light manufacture based on agro-industry as a start and promote high-tech industries.

Telecommunications:
- Develop high-tech telecommunication facilities for international and domestic services.

Expenditure Policy:
- Supplying supplementary services to enhance the growth of directly productive sectors of the economy like: Dissemination of information on investment and market opportunities.

1.4.2 "Concept Paper" – 2002

The "Concept Paper for a Rapid Transformation of the Eritrean Educational System" is a corner-stone document influencing the current reform efforts in the education sector. ICT in education will support many transformational aspects envisioned by the paper:

Life-long Learning:
- "..[The] door for furthering one's education would always be open for those who seek it and maintain appropriate levels of standard. This will be enhanced by extensive use of ICT and all venues of distance education."

Sharing of Resources:
- "During the transition period [of school facilities and programs], the high schools with better facilities...will assist those with deficiencies…through the use of ICT…"

1.4.3 Eritrea: National Education Policy (Draft) – 2003

The National Education Policy Draft contains many points supported by the scope of the National ICT in Education Policy:

National Education Policy:
- The creation of a modern, technologically advanced and internationally competitive economy.

Policy Objectives – Curriculum:
- Science and Technology and ICT will be at the heart of the new curriculum at all levels in order to cope with the rapidly developing technology and swiftly changing society.

Priority Areas of Focus – Access and Equity:

- Mobilize resources for restructuring and reallocation of government finances towards strengthening the educational system.

Priority Areas of Focus – Quality and Relevance:
- Improving teacher education and training so that teachers could acquire appropriate teaching methodology that would enhance competence in a participatory approach, and the use of new technologies.

Strategies for the Education Sector – Curriculum Reform:
- Provide teachers with sufficient training on Modern Technology and ICT as instructional, managerial and research tool.
- Prepare adequate resource materials for the enrichment curriculum courses (including Science and Technology and ICT).

Institutional Capacity Development – Managerial Capacity:
- Develop the managerial capacity of the existing staff and make preparation for more professionally trained ones with structuring and reforming the capacity development policy dimension.

Science and Technology:
- Introduce ICT as instructional, management, and research tool in order to promote creativity, independent learning, and innovative thinking in the student population.

1.5 Education in Eritrea

1.5.1 Historical Context of Education in Eritrea

Eritrea has a rich education history with a consistent national priority for literacy and innovation. Dedication to learning, at any cost, helped carry the convictions which lead the Eritrean people to independence. The Zero School and Adult Literacy Campaign helped to unify Eritreans by building a community of learners focused on enhancing knowledge and skills to form a new nation. The "culture of innovation" nurtured during the independence movement is alive today as Eritrea moves forward in the new Millennium with efforts to provide opportunity for all Eritreans through accessible, equitable, and quality education.

1.5.2 Defining Principles of Education in Eritrea

Today, the climate of education in Eritrea is one of excitement and commitment towards empowering youth and adults to develop the necessary skills to expand their opportunities, and enhance the economic and social prosperity of the country. Educators in Eritrea, whether they are policy makers at the highest level of government, or teachers in remote areas of the country, demonstrate a unique conviction to real and demonstrable improvement in the education system for all. It is clear that dialog and discourse underpin the way forward, and this "conversation" has illuminated defining education principles that guide current reform efforts:

- Education is a basic and fundamental human right.
- Every citizen of Eritrea must have access to high quality education.

- Education must be equitable, providing equal opportunity of access to under served and disadvantaged citizens, such as women, minority groups, and the disabled.
- Education must be of the highest quality, providing up-to-date resources, and current and innovative instructional methodologies.
- Education must be relevant to the needs of Eritrea, and flexible to respond to the needs of all learners, and to the realities of a changing society.

1.6 Overview of Reform

1.6.1 Access – Basic Education

Increasing access to education opportunities is a top priority of the Ministry of Education. Currently, a significant proportion of all school aged children do not have access to basic education, particularly in rural communities. National policy mandates universal basic education, and has committed to expanding and improving early childhood education programs. New school construction in underserved communities, and expanding teacher training programs underpin the MoE strategy to increase access to meet policy goals. ICT will play a critical role through capacity enhancement and distance learning.

1.6.2 Modernization – Secondary Education

The Ministry of Education sees the provision of secondary education as a critical component in Eritrea development. Secondary education is an essential locus for academic preparation for students of Eritrea. However, current secondary programs are geared exclusively towards academic achievement, and provide little in terms of practical skills and employment readiness. Moreover, a significant portion of teachers are under-qualified. To better prepare students to meet the human capacity needs of the country, a comprehensive curriculum reform effort is underway, crosscutting all sectors of education. The new curriculum embraces a student-centered, outcome-based approach emphasizing critical thinking, problem solving, and real-life (authentic) applications of their learning. This new curriculum structure will help to ensure a climate of academic rigor, and at the same time provide a more flexible environment to develop a broad-base of skills more relevant to the workplace. Complimenting the new curriculum will be substantial school upgrades, construction of new schools, sector-wide staff development, installation of classroom computers with Internet access, and other resources are planned to support students and staff for the transformation of secondary education. In addition, an expansion of tertiary education is currently underway to help bolster human capacity needs in all sectors of society.

1.6.3 Equity – Sector Wide

Currently, a significant imbalance in educational opportunities for girls and other marginalized groups exists in Eritrea. The Ministry of Education sees this disparity as unacceptable and as a significant impediment to the growth of the country. The MoE has articulated its commitment to providing opportunities to reduce impediments for the underserved. Increasing access through new schools, coupled with specifically targeted programs to raise awareness of girls education are planned

1.6.4 Literacy – Adult Education

Literacy is a significant problem in Eritrea. A key aspect of reform efforts for Eritrea is to increase the overall literacy level of her population. The Ministry of Education plans to dramatically reduce this rate through access enhancements coupled with support of program augmentation and increase of continuing education opportunities.

2 Approach to the Policy

2.1 Sector-wide Approach

The integration of ICT in Education has significant implications for the entire education sector, particularly those concerning curriculum, professional development and training, and infrastructure support. A sector-wide approach to ICT in Education will help to:

- Create a "Culture of Innovation" among all education stakeholders;
- Bring to bear alertness to the consideration of ICT integration in every aspect of education;
- Ensure that Eritrea is well positioned to "do it right."

2.2 Priorities

The Ministry of Education has mandated urgency for the deployment of ICT infrastructure throughout the education sector. The Policy balances this urgency with a pragmatic approach to help ensure all capacity elements (human and technological) are in place with clear guidelines for planning and implementation of facilities and programs. However, the immediate and urgent concern is to narrow the "digital divide" between the "haves" and "have-nots." To this end, the Policy makes special dispensation for providing ICT access and training to remote areas of the country during the first phase of the implementation.

2.3 Inter-Ministerial Discourse

Integration of ICT in the education sector has implications on many aspects of society. It will be important for policy makers to engage in dialog across ministries to:

- Validate the overarching implications of ICT;
- Ensure parity in thinking, vision and policy;
- Be responsive to evolving government policy;
- To ensure harmonization within all levels of government.

2.4 Collaborative

The Policy development has been a collaborative process. Considerable effort has been taken to consult a variety of stakeholders in formulating the draft. A subsequent sector-wide review process helped to refine the Policy to ensure alignment with the vision and mandates of the MoE and Government sectors.

2.5 Best Practices

The Policy draws, in part, on important lessons-learned from interventions and programs in Sub-Sahara Africa, and from cases around the world. Many of these "best practices" provide key insight into:

- Planning and deployment of ICT infrastructure;
- Teacher professional development and training;
- Perspective on curriculum and ICT integration.
- Maximizing efficiency of planning and deployment;
- Minimize the chance of wastage.

As the Policy is implemented, every effort should be made to revisit related case studies and best practices to ensure actions are well planned and pragmatic. However, each school and community in Eritrea is unique, and local involvement in planning is essential for buy-in and success.

2.6 Emphasis on Teaching and Learning

The mandate of the Ministry of Education directs that ICT in education must be deployed for the purpose of teaching and learning. Though the Policy addresses all components of the education sector, each aspect of the Policy is underpinned by its implications on teaching and learning.

3 Priorities for ICT in Education for Eritrea

The following are priorities for the Education Sector as they relate to ICT.

3.1 ICT in Secondary and Technical Schools

Schools best positioned in Eritrea to begin ICT programs are the upper grade schools of secondary and technical education. Some of these schools currently have ICT programs, and the human capacity to integrate such programs is most easily implemented at these levels.

3.2 Training of Master Trainers

A cascade model of training in Eritrea will be cost effective and develop a community of educators committed to supporting ICT in education. A cohort of Master Trainers made up of motivated and talented teachers will be essential to train teachers and staff in their local areas, and troubleshoot and maintain computers labs and related technology in their schools. Master Trainers will be particularly crucial in local staff development of student-centered, outcome-based pedagogical strategies put forth by the new curriculum, and essential for effective integration of ICT as a teaching and learning tool. Master trainers will be given appropriate incentives and release time from regular classes to facilitate training.

3.3 Ministry of Education Local and Wide Area Network

The Ministry of Education network is out-of-date and extremely inefficient, and upgrading the local area network (LAN) will be an essential capacity enhancement measure to support ICT in education. Included in this same effort will be the connection of all zoba offices to the main MoE offices with fixed fiber optic wide area network (WAN) essential for developing capacity of the entire education sector across all zobas. Network use policy will be developed in parallel to installation of the new network.

3.4 ICT-related Staff Development at All Levels

Human capacity development will be essential to support the planned ICT infrastructure and the new pedagogical practices required for the new national curriculum. Furthermore, a more efficient EMIS system will be essential for increasing the capacity of the sector, and related training should be a top priority. The Ministry of Education will make staff development a top priority and will pursue this vigorously.

3.5 Establishment of a National ICT Steering Committee

The Minister of Education should immediately begin the process of establishing a National ICT Steering Committee to ratify and mobilize the National Policy for ICT in Education.

4 National Policy for ICT in Education

4.1 Policy Goals

- To articulate an informed national policy framework for ICT in education to provide direction in all ICT-related endeavors in education.
- To identify important components of effective ICT integration into education in order to build awareness among stakeholders, and designate points of departure for the policy.
- To coordinate and manage ICT in education and related issues to establish a coherent policy and implementation framework.
- To outline a cross-sector strategy for pragmatic implementation of ICT in education to maximize effective utilization of tools and minimize wastage.
- To narrow the "digital divide" by addressing key constraints through the use of ICT to ensure all citizens of Eritrea has equitable access to ICT.

4.2 Presidential Articulation of National ICT Vision & Goals

The Office of the President of Eritrea is the highest level of government in Eritrea. All policy directives emerge from the Office of the President, and a clear endorsement of all policy is essential for national credibility.

Policy Objectives:
- To articulate the ICT vision and goals of the Nation.
- To ensure the National Policy for ICT in Education has credibility.

Policy Challenge:
- Communicating a public awareness of the use of ICT and how it may potentially impact all citizens.

Policy Statements:
- The President of Eritrea will articulate the ICT goals of the nation.
- The President of Eritrea will endorse the National ICT in Education Policy.

4.3 Ministerial Articulation of ICT in Education Vision & Goals

The Minister of Education is the leader of the Sector of Education in Eritrea. All education policy directives must be endorsed by the Minster of Education, both in terms of the National vision and educational relevance.

Policy Objective:
- To ensure the National ICT in Education Policy is given credibility within the Ministry of Education and the education community at large.

Policy Challenge:
- Articulating the variety of applications of ICT to the education community that best makes the importance and benefits of ICT understood.

Policy Statements:

- The Minister of Education will affirm and support the President's endorsement of the National ICT in Education Policy.
- The Minister of Education will declare support of the National ICT in Education Policy to the education community in Eritrea.
- The Minister of Education will articulate the vision and goals for ICT in Education.

4.4 Designation of National ICT Steering Committee

ICT has implications relevant to all aspects of Government and society. A collaborative body focusing on ICT in Eritrea would help coordinate and implement national strategy, and bring to bear knowledge and issues, and new developments in the field.

Policy Objectives:
- To coordinate ICT strategy and efforts throughout the public and private sectors of Eritrea.
- To bring to bear important and current ICT knowledge and developments on a national level.

Policy Challenges:
- Ensuring that the steering committee understands the educational implications of policy, including pedagogical, financial, and administrative.
- Receiving relevant and timely information from all sectors to make informed decisions.

Policy Statements:
- The Government of Eritrea will form a National ICT Steering Committee.
- Each sector of Government will appoint an ICT Officer to oversee internal ICT-related issues and considerations.
- ICT officers from selected/relevant institutions (ministries) will be members of the National ICT Steering Committee.
- ICT officers and private sector stakeholders, such as Internet providers and other technology-related companies will be members of the National ICT Steering Committee.

4.5 Review of National Communications Proclamation

The current Communications Proclamation of the Government of Eritrea makes no provision for the Internet and related network technology. A national review of the Communications Proclamation, with the intent to re-define the proclamation for a more inclusive and flexible policy, will greatly contribute to the ICT capacity potential of all sectors of Eritrea.

Policy Objectives:
- To re-define the scope of the National Communications Proclamation to include provision for the Internet and related digital technology.
- To raise awareness among policy makers of the importance of a sound and flexible telecommunications regulatory policy.

Policy Challenges:
- Establishing the political will to review and amend the proclamation.

Policy Statements:
- The Minister of Education will convene the National ICT Steering Committee to review the National Communications Proclamation, and begin discussions and procedures on a national level to re-define the regulatory policy to include the Internet and related digital technologies.

4.6   Alignment with National ICT Policy

The National ICT in Education Policy must align with the (pending) National ICT Policy. Policy makers are encouraged to find innovative solutions to ICT-related issues, particularly those arising from current infrastructure-related challenges in regions of the country.

Policy Objectives:
- To facilitate a national vision for ICT.
- To ensure policy makers have parity in vision and strategy.
- To facilitate cross-ministry collaboration on policy and strategy.

Policy Challenges:
- Coordinating the vision of ICT across all sectors in Eritrea.
- Keeping pace with new developments in ICT, and communicating informed applications of new developments, and how they may affect current policy strategies.

Policy Statements:
- Policy makers within the Ministry of Education will establish open channels of dialog, particularly with the Ministry of Transport and Communication and the Ministry of National Development and related ICT agencies, on ICT policy issues as they relate to education and the country as a whole.

4.7   Establishment of an ICT Unit

The implications of ICT are universal. Every aspect of the education sector will be impacted by the introduction and utilization of ICT technology tools. A coordinated Ministry team tasked to all ICT-related considerations is essential.

Policy Objective:
- To provide the capacity for the Ministry of Education to move forward with ICT in Education.

Policy Challenges:
- Identifying and recruiting talented individuals for the unit.
- Developing a strategic plan for the unit that meets the needs of the MoE and the entire education sector.

Policy Statements:
- The Ministry of Education will establish an ICT Unit specifically tasked to support all ICT-related considerations including sector-wide planning,

departmental support, procurement, installation, sector-wide liaison, research and development, monitoring and evaluation.
- The human capacity of this unit will be ample, especially during the planning and implementation phases of this policy.
- The ICT Unit Head will report directly to the Minister of Education.

4.8   Public Awareness Program

The Policy has broad implications for all communities in Eritrea. However, some communities may not know the implications that ICT may have on them or how it can change their lives.

Policy Objectives:
- To provide a context for all citizens of Eritrea for ICT.
- To promote the positive aspects of ICT to the citizens.
- To raise awareness among all groups throughout Eritrea of ICT.
- To manage expectations concerning ICT related issues in the country.

Policy Challenges:
- Ensuring the broadest proportion of the population has access and receives awareness communications.
- Developing a vocabulary that is understood by all language groups.
- Eliminating social and cultural barriers in both the awareness program developers and recipients of information.
- Ensuring that misconceptions about ICT are minimized, and that relevant, real-world applications are understood by the public.

Policy Statements:
- The Ministry of Education will launch and maintain a Public Awareness Program of ICT related developments and programs in the sector of education.
- The Public Awareness Program will use a variety of media to disseminate information.
- The Ministry of Education Website (See Section 4.11.6) will be a primary component of the Public Awareness Program.

4.9   Development of Departmental ICT Terms of Reference

In order to facilitate the institutionalization of ICT, each department will need to identify its various roles and responsibilities as they related to ICT within the department, and relate the significance of these roles to the institution as a whole. Within the institution, each department's ICT needs will have similarities and differences with other departments. Moreover, the diffusion of ICT practices within a department will impact the diffusion of practices within the institution as a whole. If harmonization within the Ministry is to be achieved, all departments and units within the ministry will need clearly defined roles and responsibilities, and these roles and responsibilities will need to be understood in terms of their significance in the Ministry as a whole.

Policy Objectives:

- To facilitate the change in behavior of staff and personnel to accept ICT as an important and relevant practice that brings value to their work, and to the Ministry as a whole.
- To facilitate acceptance among staff of the importance, the need, and relevance ICT brings to their lives and to the institution.
- To develop a supportive climate among staff that will allow for a sustained practice of ICT use within the Ministry.
- To raise awareness and clarity among all Ministry employees of the Policy.
- To identify specific ICT departmental needs and task related action items.
- To designate an ICT Steering Committee Member. (See Section 4.10)

Policy Challenges:
- Motivating staff to integrate ICT into their daily work practice.
- Providing staff with the necessary ICT equipment and services to minimize frustration and maximize productivity.

Policy Statements:
- Each department will develop an ICT Roles and Responsibilities Terms of Reference for the department.
- The ICT Unit will support the Departments in developing ICT Roles and Responsibility Terms of Reference.

4.10 Establishment of a MoE ICT Steering Committee

To further harmonize and institutionalize ICT within the Ministry of Education, an inter-departmental ICT Steering Committee can significantly contribute to a positive transformation to an "e-Ministry."

Policy Objectives:
- To significantly support and strengthen ICT-related policies and programs at the MoE and the six zobas.
- To establish a visionary and dedicated advisory group concerned with ICT-related developments, issues, and strategies for the sector of education.

Policy Challenges:
- Ensuring a balance of education-oriented and policy/administrative-oriented members of the committee.
- Articulating committee findings and recommendations that are understood by policy makers.
- Harmonizing and prioritizing findings that will be viable within the current capacity environment.

Policy Statements:
- The Ministry of Education will designate an ICT Steering Committee.
- The ICT Steering Committee will be made up of educators appointed by each of the respective departments and units of the Ministry.
- The ICT Steering Committee will be a recommending body concerning all aspects and implications of ICT in education, particularly as they relate to teaching and learning.

- There will be a balance of IT and education specialists on the committee.
- The activities and schedules for the ICT Steering Committee will be coordinated by the ICT Unit.

4.11 Establishment of ICT Infrastructure for the Ministry

The ICT infrastructure of the Ministry of Education must work efficiently and reliably, and must be utilized for the benefit of the Ministry and its operations. The measures in this section are critical and should be implemented as soon as possible. The initial investment of dedicated technical staff will be returned through their attention to other matters concerning ICT in Education of Eritrea.

General Objectives:
- To ensure the Ministry of Education has an efficient ICT network.
- To reduce the "capacity gap" between top officials and junior staff.
- To significantly strengthen the information processing capacity of the MoE.

4.11.1 Establishment of a Ministry-wide Network

Policy Objectives:
- To more efficiently coordinate and manage Ministry functions, programs, and procedures.
- To significantly strengthen communication capacity between MoE Headquarters, the Regional Offices, Desks, Clusters, and schools.
- To provide a mechanism for efficient and secure document sharing storage, processing, and retrieval.

Policy Challenges:
- Installing a secure and stable network.
- Funding, maintenance, and sustainability of the network.

Policy Statements:
- The Ministry of Education will procure and install a Local Area Network (LAN).
- The Ministry of Education will procure and install a Wide Area Network (WAN), connecting all Ministry offices, Desks, and schools in Eritrea.

4.11.2 Security and Virus Protection

The current situation at the Ministry in terms of desktop computer viruses and other electronic nuisances is unacceptable, and wastes time.

Policy Objectives:
- To ensure all ICT-related data at the MoE, Regions, and schools are electronically secure, and risk free from Internet-related threats.

Policy Challenges:
- Developing best practices among staff to minimize virus threats.

Policy Statements:

- The MoE will purchase, install, and maintain up-to-date security software, and any necessary hardware to eliminate the virus problem and the potential for outside "hacking" into the MoE computer network.
- Security measures will be taken to minimize misuse by employees.

4.11.3 Establishment of a Software Policy

Policy Objectives:
- To maximize computer operations efficiency for the MoE.
- To streamline technical support for maximum efficiency.
- To provide a mechanism to review current and future software needs.

Policy Challenges:
- Educating policy makers on the benefits of free and open source software (FOSS).

Policy Statements:
- The MoE will review and identify employee software needs, and designate a standard software configuration for all computers at headquarters.
- A policy and guidelines for software identification, installation, usage and review will be developed.
- The ICT Unit will play a leadership role in creating the Software Policy.
- The Software Policy will specifically accommodate free and open source software (FOSS).
- The Software Policy will make provision for proprietary software.
- The Software Policy will be flexible to accommodate the diverse needs of Eritrea.
- The Software Policy will include "need to have" stipulations for unique needs for departments/divisions, such as EMIS, ICT Unit, and Administration and Finance.
- The Software Policy will be formally reviewed annually to ensure the policy remains aligned with the needs of the sector.

4.11.4 Employee Email

Policy Objectives:
- To standardize all employee electronic communication.
- To strengthen capacity for internal and external communication.

Policy Challenges:
- Mitigating email-based security threats.
- Engendering a regular institutional practice of email correspondence.
- Developing best practice use of email correspondence.

Policy Statements:
- All employees of the Ministry of Education will have a designated email account for work-related use.

- All employees of the Ministry of Education will integrate email use into their daily professional practice.

4.11.5 Establishment of a Network Use Policy (NUP)

In parallel to the network installation a Network Use Policy (NUP) will be developed.

Policy Objectives:
- To standardize rules and regulations for MoE network use and operations.
- To ensure all employees understand the rules and regulation of network use including email, file server, and the Internet.
- To create a climate of professional, accountable, and responsible use of the network.
- To provide regulations and procedures for electronic documents within the MoE.

Policy Challenges:
- Establishing a legitimacy of the policy among employees.
- Facilitating regular use of the network by all employees.
- Monitoring network use and organization of files and data.

Policy Statements:
- The MoE will develop a Network Use Policy (NUP) designating policy, guidelines and procedures as they relate to the use of the MoE network and email.
- The NUP development will be an inter-departmental collaborative process lead by the ICT Unit, and will consider best practices from the region and world.
- The ICT Unit will lead the development of the Network Use Policy.
- All employees will be trained on the NUP.
- All employees will sign the NUP in duplicate: one copy for the employee, and one copy to be kept in the employee record file.

4.11.6 Establishment of an MoE Website

Policy Objectives:
- To establish a global presence for the MoE.
- To facilitate public awareness of the policies and programs of the MoE.
- To provide a resource for researchers including downloading of public documents.
- To provide a forum for human resource development.

Policy Challenges:
- Hiring a webmaster familiar with related educational issues and practices.
- Developing a process for content identification and development.

Policy Statements:
- The MoE will procure the necessary hardware, software, domain and host to establish a state-of-the-art and robust website.

- The MoE will establish the website.
- The MoE will hire a webmaster and website team for design and maintenance.
- The ICT Unit will lead the website initiative.
- The ICT Steering Committee will coordinate Ministry-wide website content.

4.11.7　　　Ministry ICT Training Facilities

With the implementation of the Policy, the Ministry of Education will engage in significant training of its employees.

Policy Objectives:
- To establish a reliable and convenient ICT training facility for on-going training activities for Ministry employees.
- To minimize out-sourcing costs for training.

Policy Challenges:
- Staffing and maintenance of the facility.

Policy Statements:
- The MoE will procure and install a state-of-the-art training facility within the confines of the MoE headquarters.
- The ICT Unit will coordinate the development and maintenance of the facility.
- If necessary, a convenient and adequate external ICT training facility will be designated by the Ministry for the purpose of employee training.

4.12 Multimedia Development Center

The Ministry of Education sees multimedia as a critical element in the overall ICT program for education. To that end, the MoE wishes to establish a multimedia center for research, development, and distribution of multimedia materials.

Policy Objective:
- To establish a state-of-the-art multimedia center to develop multimedia educational materials for formal and non-formal education.
- To develop multimedia educational resources relevant to the context of Eritrea.

Policy Challenges:
- Funding for the multimedia center.
- Staffing the center with trained human resources.

Policy Statements:
- The Ministry of Education will establish a multimedia research and development center to design and produce multimedia materials for educational purposes including: CD-ROM, video cassettes, television programs, audio cassettes, mother tongue materials, radio programs, computer programs, virtual laboratories, etc.
- The ICT Unit will coordinate the development and administration of the center.

- All MoE Departments will actively participate in the development of multimedia materials for their respective programs.

4.13 Human Capacity Development

Human capacity development is the cornerstone for a sector-wide approach to ICT in Education. Human resources are the organs of any institutions, and their professional development and training is essential for a functional, responsive, and flexible institution. The Ministry of Education is the organizational and administrative body for the Education sector in Eritrea. The scope of the Ministry of Education includes formal and non-formal education in their entirety. The MoE has administrative authority over tertiary education institutions and universities, and works closely with non-governmental institutions to ensure parity of curricula and equitable distribution of students. Human capacity considerations at the MoE affect the entire education sector through the transference of students and staff throughout the sector.

General Objective:
- To facilitate a responsive, efficient institutional capacity through continued human resource development and recruitment.

Policy Challenges:
- Targeting and prioritizing staff development.
- Aligning training outcomes with respective needs of all staff.
- Engendering a social transformation to acceptance and daily practice of ICT tools.

Policy Statements:
- Ministry of Education will make human capacity development in ICT a top priority.
- The Department of Research and Human Resource Development (RHRD), in close collaboration with the ICT Unit, will oversee all ICT-related human capacity development.
- Human capacity development will include traditional, distance, and e-learning modes of delivery.

4.13.1 Regulation and Financing

Policy Objective:
- To clearly define the role of the Ministry of Education as the regulator and financier of ICT-related human resource development within the education sector.

Policy Challenges:
- Securing funds for human capacity development.

Policy Statements:
- The Ministry of Education will be the primary regulator and financier of human resource development within the education sector.
- The scope of the Ministry of Education human resource development will be including: Ministry staff, teacher in-service training.

4.13.2 Ministry of Education Staff

Ministry of Education staff includes all staff employed by the MoE, including teachers, administrators, support staff, headquarters and zoba office staff, pedagogical support staff, etc.

Policy Objectives:
- To create an ICT-literate MoE staff.
- To establish a standard of ICT literacy for the MoE.
- To facilitate a climate of transformation to a less paper-reliant administrative bureaucracy.
- To train staff on appropriate use of the MoE network and email.
- To establish an accountable understanding of the policies and practices of document classification, sharing, and security for all staff.
- To establish a provision to train designated MoE staff for specialized software requirements.
- To establish a provision for decentralized human resource development.

Policy Challenges:
- Financing and prioritizing staff training.
- Inculcating a behavioral change for ICT use among staff.

Policy Statements:
- All Ministry employees, including MoE staff, directors, and teachers will receive basic ICT training.
- A basic ICT literacy level will be required by all staff.
- All staff will be trained on both proprietary and open source software.
- The ICT Unit, in collaboration with all Ministry departments, will develop a basic ICT literacy curriculum and program, and develop a sector-wide training plan.
- The ICT literacy training will be flexible to accommodate alternative technologies, such as satellite downlink, solar panel powered ICT, VSAT, and simulated Internet environment, to be used in remote areas of the country.
- All MoE staff will be trained in network use and email.
- All MoE staff will sign the Network Use Policy (NUP) *before* being assigned their account user information and allowing them to use the network.
- Appropriate staff will be trained on specialized software, depending on the needs of the specific departments and divisions of the MoE.
- Staff-specific specialized training will be coordinated with RHRD and the ICT Unit.
- The Ministry of Education will integrate a distance education program for human resource development, particularly for the training and upgrading of teachers.
- The Ministry of Education will seek relationships with current distance learning institutions, such as the African Virtual University, to help leverage an Eritrean distance education program.
- The Ministry of Education will utilize ICT innovations to enhance distance learning through a parallel e-learning program.

- The human capacity development provision of the Ministry of Education will include the option of out-sourcing of staff-related training to the private sector.

4.13.3 Teacher Training

Teachers will be the primary focus of human capacity development for ICT in education. As the new National Curriculum focuses on student-centered, outcome-based instruction, ICT technology will play a significant role in this transformation. Eritrea has a shortage of qualified teachers, and an increase in need will soon result from building new schools, and the phasing out of expatriate teachers. As the new curriculum brings technology integration to bear on all aspects of education, pre-service and in-service teachers must be prepared for these new developments in pedagogy and practice.

Policy Objectives:
- To inculcate a tradition of ICT literacy in education.
- To engender new standards of the teaching profession.
- To provide a supportive and iterative environment for developing best practices for curriculum and technology integration.
- To ensure all teachers have a basic ICT literacy.
- To support teachers in the pedagogical and technological transformation in Eritrea.
- To establish a "culture of innovation" among educators through practice.
- To engender the spirit of collaboration among educators.

Policy Challenges:
- Facilitating the pedagogical transformation of all teachers.
- Accommodating for the disparity in levels and abilities within the teaching population.
- Inculcating ICT integration in teaching practices.

Policy Statements:
- The DRHRD, the DGE, and other departments will work closely with all tertiary teacher training programs to plan and implement basic ICT literacy and pedagogical training for integration of ICT in teaching and learning for all pre-service teachers.
- All in-service teachers will achieve a basic level of ICT literacy through Ministry-provided training.
- Teachers will be provided specialized pedagogical training concerning theory and practice of technology integration in teaching and learning.
- The establishment of a Society of Innovative Educators will be one component of in-service professional development (see below).
- The MoE ICT Unit and the ICT Panel at the DGE will work closely with all departments in advising on ICT applications for teaching and learning, developing the national training plan and curricula. This process is time consuming and should begin immediately.

4.13.4   Staff Performance Appraisal and Advancement

It is intended that Ministry of Education staff performance appraisal will be modified to include measurement and evaluation of ICT-related considerations, and including those that apply to teachers and their practice.

Policy Objectives:
- To ensure that the standard of performance among all staff remains high.
- To establish incentives for adjustment of professional practice.
- To specifically provide a framework for expectations for teachers in terms of the new National Curriculum and ICT integration.

Policy Challenges:
- Developing fair and equitable phase-in procedures for ICT-related performance appraisal and salary advancement mechanism.

Policy Statements:
- An appropriate incentive scheme for staff performance appraisal and/or advancement will be developed for all staff that includes demonstration of ability to integrate technology in their daily work.
- RHRD and the Department of General Education (DGE) will collaborate with the Technical Education and Vocational Training (TEVT) and Adult and Media Education (AME) on the development of new performance appraisal instruments and an implementation plan.
- Augmentation of skills will contribute to salary advancement.

4.13.5   Formal Education

The provision of formal education includes all levels of school from kindergarten to post-graduate studies (K-20) including regular and technical education. The policy must be clear on how the MoE will approach ICT in formal education.

Policy Objectives:
- To establish a standard of provision for all students in formal education in terms of ICT-related human capacity development.
- To set expectations among the education sector on the scope of ICT in education.

Policy Challenges:
- Providing the necessary infrastructure for equitable access to ICT for all formal education students

Policy Statements:
- The MoE will provide equitable opportunities for students of formal education, including kindergarten, primary, secondary, technical, and tertiary students, to access and utilize ICT tools as stand-alone courses and as a teaching and learning tool.

4.13.6　Non-formal Education

A provision of non-formal education includes adult and continuing education, out-of-school youth education, special needs, marginalized groups, and other students not served by formal education.

Policy Objectives:
- To establish a standard of provision for all students and participants in non-formal education in terms of ICT-related human capacity development.
- To set expectations among the education sector on the scope of ICT in education.

Policy Challenges:
- Identification of appropriate technologies for non-formal education.
- Awareness raising across the education sector of non-formal education issues, especially as they relate to ICT as a teaching and learning tool.

Policy Statements:
- The MoE will provide equitable opportunities for students of non-formal education, including adult and continuing education, out-of-school youth, special needs, marginalized groups, and other students not served by formal education, to access and utilize ICT tools as stand-alone courses and as a teaching and learning tool, and any appropriate applications to advance their learning needs.

4.14 Regional and Sub-regional Offices

4.14.1　Network Infrastructure

Policy Objectives:
- To close the capacity gap between Headquarters and the Regional offices of the Ministry of Education.

Policy Challenges:
- Cost and lengthy procurement periods.
- Sustainability and maintenance of the network

Policy Statements:
- All regional and sub-regional offices of the Ministry of Education will have a computer network linked to the Ministry headquarters.
- This network will be used for data transfer, file sharing and email.

4.14.2　Establishment of Regional ICT Unit

Policy Objectives:
- To facilitate management and assessment of ICT-related issues and programs in the Regional Offices, Clusters, and schools.

Policy Challenges:

- Finding skilled and knowledgeable staff that can support technical issues as well as pedagogical issues associated with ICT as a teaching and learning tool.

Policy Statements:
- The Ministry of Education will phase in Regional ICT Units in all regional offices of the MoE.
- Trained teachers (master trainers) will be the primary source of staff for the regional ICT units.
- The MoE will appoint a Regional ICT Unit Head that will report to the MoE ICT Unit Head at headquarters in Asmara.
- The MoE ICT Unit will help to identify and staff the Regional ICT Units.
- The Regional ICT Unit will be in close contact with the Clusters, Desks, schools and the headquarters ICT Unit on ICT-related issues and programs.
- The Regional ICT Unit will remain separate from the EMIS-related activities, unless called upon for ICT-EMIS synergies.

4.14.3 Regional MoE Staff Development

Staff of the Regional Offices, Pedagogical Resource Centers, Adult Literacy Centers, Clusters, and Desks will require a variety of special training concerning ICT related plans and developments. Among these will be: new systems of data collection and transmission to headquarters, receiving and distributing curriculum pilot materials, providing local training on a variety of initiatives.

Objective:
- To facilitate the deployment, retrieval, and organization of new EMIS data collection procedures.
- To facilitate the national curriculum pilots in their region.
- To support local pedagogical and technical training.
- To create a more supportive and efficient zoba staff to enhance capacity for a variety of education sector activities.

Policy Challenges:
- Rapid deployment of EMIS tools, curriculum, and other resource materials to remote schools.
- Efficient communication between zoba offices and local offices, pedagogical centers, and schools.

Policy Statements:
- Staff from Regional Offices, Pedagogical Resource Centers, Adult Literacy Centers, Clusters, and Desks will receive specialized training on new EMIS systems for data collation and transmission.
- Staff from Regional Offices, Pedagogical Resource Centers, Adult Literacy Centers, Clusters, and Desks will receive training to support national curriculum piloting efforts, distance learning, and other zoba-related activities.

4.15 Curriculum and National Examination

4.15.1   Establishment of an ICT Panel at the DGE

ICT in Education will have a significant impact on all aspects of curriculum and pedagogy. It will be very important that a coordinated ICT Panel is established at the Department of General Education.

Policy Objectives:
- To coordinate all curriculum and pedagogical considerations as they relate to ICT for teaching and learning.
- To designate a team to develop curricula, teacher guides, teacher training programs, ICT in Education website, and other ICT-related resources for the MoE.

Policy Challenges:
- Adequately staffing the ICT Panel without compromising programs in schools through staff transfers.
- Developing a new national exam that integrates measurement of student outcomes and competency skills.

Policy Statements:
- The Director General of the Department of General Education will immediately establish and staff an ICT Panel for the purpose of developing ICT-related curriculum as stand alone courses, and using ICT as a teaching and learning tool.
- The ICT Panel head will develop a strategic plan for the new ICT Panel, with the help of the ICT Unit and third party consultants if needed.
- The ICT panel will be made up of experienced teachers in the field that have developed ICT related activities and curricula.
- The ICT Panel's responsibilities will include the development, testing and production of all ICT-related curricula, teacher guides, teacher training programs, the ICT for teaching and learning aspect of the MoE website, and any other ICT-related considerations for pedagogy, and teaching and learning.

4.15.2   National Curriculum Reform

Information and knowledge have become the fundamental tools for economic prosperity for the 21st Century. Curriculum is the framework for responding to evolving needs in society and civilization. Therefore, all departments of the MoE will reform their respective curricula to respond to the needs of a flexible economic outlook for Eritrea.

Policy Objectives:
- To establish an education sector response to the information society.
- To provide students with content and process skills important in the work-place and for career flexibility.
- To facilitate the vision for global economic competitiveness for Eritrea.
- To facilitate a life-long learning practice among citizens of Eritrea.

Policy Challenges:

- Efficiently piloting the new curriculum, such as timely dissemination of materials to local schools.
- Preparing teachers for the new pedagogical paradigm of the new national curriculum.
- Choosing and supporting motivated teachers to conduct the pilot with enthusiasm, and able to convey this enthusiasm to other teachers, administrators, and students for diffusion of innovations.

Policy Statements:
- The national curriculum will be reformed to facilitate the development of the knowledge, skills, attitudes and actions important for an information literate society.
- The new curriculum will be revised to accommodate a more student-centered, outcome based approach.
- All aspects of the new curriculum will include the provision of ICT as a teaching and learning tool.
- The new curriculum will accommodate for alternative assessment strategies, specifically portfolio assessment, project-based learning, and authentic activities that have real-world applications.
- All curriculum development departments, including the AME, DGE, and TVET, will have regular inter-departmental meetings to discuss ideas, strategies, and issues related to curriculum, particularly as it relates to ICT as a teaching and learning tool.

4.15.3 Basic ICT Literacy Curriculum

Policy Objectives:
- To establish a standardized curriculum for basic ICT literacy.

Policy Challenges:
- Ensuring no duplication of efforts.
- Ensuring equity of access for all students.
- Adapting the curriculum to be suitable for all levels of education (K-12).

Policy Statements:
- The DGE, TVET, and AME, facilitated by the ICT Unit and the DGE ICT Panel, will develop curriculum for basic ICT literacy. This provision will intervene at all levels of education: kindergarten, primary, middle, and secondary schools.

4.15.4 ICT as a Teaching and Learning Tool

Policy Objectives:
- To inculcate the practice of utilizing ICT as a teaching and learning tool.
- To utilize ICT tools in student-centered teaching environments.
- To provide a means for demonstration of outcome-based learning.

Policy Challenges:
- Pedagogical transformation of teachers.
- Procurement and installation of ICT tools in schools and other learning environments.

Policy Statements:
- ICT will be integrated across the curriculum as a teaching and learning tool.
- Curriculum design will include provisions for ICT integration in every topic of instruction, and at every level of education from kindergarten through Grade 12, including adult and technical education.
- The DGE, TVET, and AME will work with the ICT Unit and curriculum experts to develop a phased implementation approach that is congruent with local human and infrastructure capacity.

4.15.5 Revision of Assessment Procedures & Examinations

The education reform strategy in Eritrea has sector-wide implications on student learning outcomes. Until now, assessment of students has focused mainly on a "content banking" approach, where students recall memorized information as the measure of learning. The transformation to include a student-centered, outcome-based approach to learning will require that the National Examination for academic advancement be reformed to reflect these new learning skills and practices.

Policy Objectives:
- To ensure parity with learning outcomes and assessment.
- To provide a mechanism to measure the effectiveness of curriculum reform.

Policy Challenges:
- Informing and engendering the development of alternative assessment tools among MoE staff.
- Training teachers in practicing alternative assessments.
- Designing examinations that accurately measure process skills without burdening the system through extended marking time.

Policy Statements:
- In order to measure the knowledge, skills and behaviors developed by the new outcome-based, student-centered curriculum approach, the national examinations will be revised to accommodate this new approach.
- In addition to a cognitive measure, a performance-based assessment will be implemented that includes student portfolios, project-based learning, and authentic learning that is relevant to real-world work.
- Ability to utilize ICT as a tool for learning will be an important measurable component of this examination.
- The DGE, DRHRD, the ICT Unit, and experts in developing assessments for ICT integration will collaborate to revise the national examinations.

4.16 ICT in Schools

4.16.1 School Vision and Plan

The school is a part of the community. Installing ICT technology to schools, and utilizing it for teaching and learning, will illicit a variety of responses and reactions from members of the school community. The community will play a key role in shaping the vision of ICT for the school.

Policy Objectives:
- To establish a forum for community dialog and discourse on ICT in the school.
- To provide awareness in the school community of the benefits and applications of ICT as a teaching and learning tool.
- To ensure computers and facilities are secured to minimize theft.

Policy Challenges:
- Ensuring the plan is equitable and has realistic goals and objectives.
- Developing a sense of community commitment important for success of the plan.

Policy Statements:
- In order to promote a more effective use of ICT, and be sensitive to equity and the community's socio-cultural needs, each school community will develop a clear, shared vision and plan of ICT integration in their school.
- The vision and plan will be a collaborative effort to include school staff, teachers, students, parents, and the community at large. An ICT master plan will be developed as a result of this vision.
- The Ministry of Education, facilitated by the ICT Unit will provide guidelines for the development of the school plan, including security.

4.16.2   ICT Coordinator

Policy Objectives:
- To provide leadership for ICT-related issues and considerations in schools.
- To provide ICT-related administrative and pedagogical support for schools.

Policy Challenges:
- Heavy burden of work put on the coordinator.
- Developing strategies, such as student support technician programs, to ease the burden on the coordinators.
- Developing interest and enthusiasm among other staff to support the coordinator in ICT related efforts in the school.

Policy Statements:
- Every school will appoint ICT Coordinator, or head of ICT department, who help ensure administrative and pedagogical support for teachers.

4.16.3   School Technology Committee

Policy Objectives:
- To provide an ongoing forum for dialog and discourse related to ICT issues and considerations in the school.

Policy Challenges:
- Buy-in by all school staff.
- The integration of ICT into the routine work practices of staff.
- Translating plans into actions.

- Establishing an effective monitoring and evaluation mechanism for school plans.

Policy Statements:
- Each school will establish a Technology Committee, headed by the ICT Coordinator, to focus on issues related to ICT as a teaching and learning tool.
- The committee will include a school administrator, teachers, and other stakeholders in education.
- The technology committee will include at least two students, one school administrator, and one member of the community.

4.16.4   Community Engagement

Every region and school is different, and will have some unique needs. A policy of community engagement will help to ensure these needs are met.

Policy Objectives:
- To ensure public awareness of programs, plans and events related to ICT.
- To provide open dialog between school and community concerning ICT.

Policy Challenges:
- Developing understanding within the community of the intent of the new curriculum and the role of ICT in education.

Policy Statements:
- The school will make every effort to engage and include the community in dialog and discourse around issues important for the new curriculum and ICT in education.

4.16.5   School Acceptable Use Policy (AUP)

An acceptable use policy (AUP) relating to ICT in schools is an important instrument in school to establish expectations in the school around ICT. The policy includes appropriate use behavior when students are using computers and the Internet, and designates specific behaviors, such as tampering, maliciousness, accessing inappropriate Internet content, as "misuse", and specifies consequences to be levied if misuse occurs.

Policy Objectives:
- To designate acceptable and unacceptable use of ICT tools.
- To affirm responsibility and accountability for appropriate use of ICT tools.
- To designate consequences of misuse.

Policy Challenges:
- Establishing a high credibility of the AUP.
- Developing an understanding among parents and students of the reasons behind the policy and the necessity for consequences of inappropriate behavior.

Policy Statements:

- The Ministry of Education ICT Unit will provide each school with guidelines on acceptable use of computers and the Internet.
- Each school will develop and implement its own acceptable use policy in order to meet their contextual needs.
- The AUP will be translated into the local language to ensure understanding.
- Each student and parent will sign the AUP in understanding and agreement.

4.16.6 Technology in Educational Facilities

Policy Objectives:
- To ensure learners in formal and non-formal institutions of Eritrea have access to ICT.
- To ensure learners in formal and non-formal institutions of Eritrea are provided the opportunity to harness the benefits of ICT for economic, social and cultural advancement.

Policy Challenges:
- Facilitating the procurement and installation of ICT in remote areas.

Policy Statements:
- All schools, pedagogical resource centers, and adult literacy centers will receive appropriate ICT technology to fulfill the requirements of the new curriculum and programs in the education sector. This may include audio cassette, video and DVD, television, computer lab, Internet access, and related peripherals, software, and support technology.
- All schools will provide the ways and means for the local community to utilize ICT facilities.
- Providing ICT in remote and isolated communities will be a top priority.
- Alternative solutions will be implemented, including solar panels, diesel generators, and satellite downlink technology in remote areas.

4.17 Environmentally Safe Goods and Procedures

All directives initiated from the National Policy for ICT in Education will be environmentally safe, including the types of goods purchased and the activities conducted.

Policy Objectives:
- To ensure that ICT use in schools and communities are free from hazard to the users and the environment.

Policy Challenges:
- Developing and implanting a national policy for environmentally safe goods and procedures for ICT.

Policy Statements:
- All goods and procedures as they relate to ICT in Education will be environmentally safe.

- The Ministry of Education will facilitate a national discussion on environmentally safe goods and procedures, including make these practices law.

5 Strategy for ICT in Education

The strategy outlined in this section of the policy aim to provide a framework for ICT integration across the education sector to maximize the capacity for their utilization for teaching and learning.

5.1 Budgeting

Budgeting should be inclusive of educators who are in a position to understand the relative value of certain ICT-related tools in terms of institutional administration and teaching and learning.

- Team approach to identifying cost components.
- The team should include members from Planning and Budgeting, the ICT Unit, and the MoE ICT Steering Committee.
- Clear rationale for all cost components
- Develop a provision in the budgeting process to include options for "best fit." For example: ICT procurement and implementation plan for a secondary school in Asmara, where infrastructure is reliable, should be different than an ICT procurement and implementation plan in a rural area of Anseba.
- Utilize ICT tools and software for budgeting.

5.2 Recurrent Costs

Technology, by nature, has a finite lifetime before obsolescence. Recurrent costs of maintenance and upgrade can be defrayed by a thoughtful roll-out of the initial technology investment in the sector.

5.2.1 Free and Open Source Software (FOSS)

Proprietary software has prevalence in ICT. However, a significant and compelling alternative exists that provides Free and Open Source Software (FOSS) solutions for users. Although there is a trend for proprietary software companies to offer governments and Ministries free software to support their ICT role-out, the "down-the-road" costs in licensing and hardware upgrades can be debilitating in a lean budget environment. Furthermore, once countries are "locked-in" to a proprietary solution, it is very difficult to "refit" from proprietary to open source. Many countries in Africa have implemented FOSS programs for the education sector. Some strategies include:

- Engage in high-level discussion regarding proprietary vs. open source software.
- A decision should be made early regarding the designation of proprietary vs. FOSS.
- Draw on other African experiences with software deployment before making the decision.
- Allow innovation among educators who would like to try alternative approaches.
- Develop a budget projection, with two options, one with proprietary solutions and one with a FOSS solution.

- Draw on local expertise in the ICT community in Eritrea in making the software decisions. Many experts in the field can provide the Ministry valuable perspective on proprietary vs. FOSS.

5.2.2 Student Support Technicians

Technical support for teachers and schools, especially during ICT for teaching and learning classroom instruction, will be crucial, especially in the short and medium range phases of ICT rollout. Every school will need to have a hired technical staff to facilitate all the school technology needs. However, a Student Support Technician (SST) program in schools will help to ensure the development of a cohort of students that are authorized to support teachers and administer systems. This will not only support teaching and learning needs, but will provide a valuable training program for students.

- The MoE should establish guidelines for a Student Support Technician (SST) program for schools.
- African and world case studies should be consulted in developing the SST program.
- The MoE should use its public awareness campaign to advertise the program.
- The SST program should be accredited by the MoE as a regular course that will apply to successful completion of secondary school.

5.2.3 Community Linkage

Support from the community, in terms of human and financial resource should be discussed at the national, zoba, sub-zoba, and school level.

- The MoE should provide schools with guidelines on engaging the community to support ICT related school activities.
- Strategies should include potential ways to raise funds for recurrent costs.

5.2.4 Public/Private Partnerships

Public/Private partnerships will be very important in sustaining the ICT in education. Some strategies include:

- Creating a mentorship program for school-to-work.
- Establishing a mechanism to respond to human resource supply needs.
- Engage the private sector in telecommunications and related strategic planning.
- Use the MoE website to inform the public and private sector of respective programs and activities related to ICT.
- Provide resources and training for grant writing and fund raising.
- Negotiate a reduced ISP fee for schools.
- Using National Service in ICT-related endeavors.
- Tap-in to existing ICT related program, such as those provided by the National Union of Eritrean Women, and the National Union of Eritrean Youth & Students.

5.2.5 School-based Telecentres

Converting the school Internet lab into a revenue generating "Internet Café" is one of the best models for recovering recurrent costs associated with ICT. Some strategies include:

- Creating a nominal fee structure for student use of the Internet after school hours.
- Developing an open community Internet Café, including business facilities such as photocopy, fax, and printing.
- Provide organized classes community participation such as basic ICT skills, Internet research, and advanced applications.
- Develop an advertisement campaign for telecentres.

5.2.6 School Fees

Schools should consider levying additional annual fee for all enrolling students to off-set costs of the ICT facilities.

5.3   Planning

As ICT becomes more relevant and important in programs, planners will need to have a good grasp of the implication of ICT, plus have the flexibility and will to seek a variety of stakeholders during the planning process.

5.3.1 Strategic Planning

It will be essential that all departments of the Ministry of Education conduct a departmental strategic plan that includes the roles, terms, and expectations as they relate to ICT in education.

5.3.2 Collaboration

Collaboration is a key component to making sound planning decisions, particularly in planning for ICT for teaching and learning.

- Include all relevant and impacted departments in the planning process.
- Provide for an inter-ministerial planning mechanism, particularly with ICT-related ministries.
- It will be crucial to include both public and private sector in the planning process for ICT in education. The roll-out of ICT in schools will have significant implications for all sectors. Consider including, local private ISP providers, local manufacturers, the University of Asmara and other tertiary institutions.
- Collaboration will minimize wastage, especially in purchasing unnecessary equipment.

5.3.3 Case Studies

Case studies and best practices will be essential information in planning. Some suggestions include:

- Seeking out program planning strategies and best practices developed by Sub-Saharan African countries and other similar contexts around the world.

- Review and discuss relevant publications from organizations such as the World Bank, UNESCO and the Commonwealth of Learning.
- Fund study visits to countries conducting similar programs.

5.3.4 Crosscutting Topics and Issues

ICT has implication in all sectors of government and society. The planning process must have a mechanism to consider crosscutting implications or themes.

- Revise planning templates to include crosscutting considerations, such as sustainability and security.
- Include experts from various stakeholder groups, such as IT teachers, school directors, and the private sector.

5.3.5 Planning Transparency

The planning process should be transparent in order to be inclusive and prudent in terms of resources, both financial and human.

- Hold regular review session of plans.
- Provide a venue for public review and feedback on high-stakes planning (MoE website).

5.4 Program Interventions

An important mechanism for exploring contextual aspects is the program intervention, or pilot. Though the planning process will be thorough, not all variables influencing a program idea will be identified without testing the idea in the field. Since ICT programs and training by nature require a significant investment of capital and human resource, it will be prudent to pilot ideas, especially those in rural and remote areas of the country. Suggested pilots include:

- Solar technology for power generation.
- Low-power ICT network solutions, such as thin-client technology.
- Satellite provider of information and Internet, such as VSAT or World Space.
- Short range FM radio transmission for adult literacy.
- Hand-held computer devices for data collection and organization.

5.5 Research and Development

Research and Development (R&D) will be a critical aspect of ICT in Education.

- An R&D team must have an educator on staff that has experience with ICT in education for teaching and learning.
- Finding new, cost-cutting solutions, particularly with FOSS and durable technologies important in low infrastructure and rural environments.
- Action Research will be a critical component for collecting formative data from the field. The MoE website can serve as a repository of action research data to share with the education community. Action research will be an important component of the Society of Innovative Educators.

5.6   Monitoring and Evaluation

Monitoring and evaluation (M&E) will be an essential strategy for ICT in Education.

- An M&E team will be essential for effective program implementation.
- All planning efforts should include a M&E plan, including identifying impact or outcome indicators, developing benchmark assessments, and develop data gathering strategies for program evaluation.
- The M&E team should pursue innovated data collection strategies that employ ICT tools in the field.
- Every effort should be made to include both formative and summative evaluations for programs. The MoE should consider implementing tracer mechanisms for high stakes programs.
- Results of programs could be an important highlight to include in the MoE website.

5.7   Challenges of Sustainability

The initial capital investment for ICT in education is considerable, and planners should consider the prospects of sustainability in all initiatives.

- All planning must include a sustainability plan.
- The MoE must create a "human capacity buffer" to ensure that current programs can be staffed appropriately after attrition. Program policies, guidelines and job descriptions will be key elements in helping to sustain programs.

5.8   Pedagogical Considerations

5.8.1 Establishing a Need

Technology is not an end in itself; it is a tool to be used appropriately. As ICT is integrated in teaching and learning, educators must establish a need, or rationale, for using the technology in that specific situation or in the chosen instructional capacity. In other words, what is the *benefit* that technology brings to this lesson? All curriculum developers within the sector should engage in dialog and discussion on this matter, and develop strategies that clearly show need to teachers and students.

5.8.2 Classroom Configuration

The most appropriate ergonomic configuration for classroom computers is in a horseshoe-shaped arrangement, with the computers placed around the perimeter of the room, with the monitors facing inwards. This is true for instruction and physical wiring of the network. Ideally, a work table will be placed in the center of the room to be used when students will need a place to do small group work, or the teacher conduct full group instruction away from the computer. A computer island can be installed in the center of the horseshoe for economy of space if needed.

5.8.3 Formal and Non-formal Education

Pedagogical transformation must occur throughout all education sub-sectors. Regular discussions on this matter through discussions between all curriculum developers and

human capacity development staff will ensure pedagogical transformation occurs throughout all sub-sectors, and that overlap and wastage are minimized.

5.8.4 Community of Learners

An important pedagogical element for ICT in Education will be to establish an online community of learners for classroom instruction. The DGE ICT panel should develop the framework and guidelines for such a community, and include related training in its professional development plan.

5.8.5 Variety of ICT Tools

ICT is not just computers, and many technology tools should be considered that best fit the situation in Eritrea. Tools to consider are television, audio cassettes, video cassettes, radio, telephone, video microscopes, software games, multimedia, virtual laboratories, solar panel powered ICT, and other related innovations. As planners are developing curriculum and teacher training, a variety of tools and pedagogical applications should be considered, especially for regular and technical schools, pedagogical resource centers, and adult centers to best fit the context of Eritrea.

5.9 Curriculum Considerations

5.9.1 Current Reform Effort

The current curriculum reform effort in Eritrea emphasizes a student-centered, outcome-based approach. ICT fits well within this framework as tool for teaching and learning. The newly designated ICT Panel will be essential in facilitating ICT-related pedagogy and curricula. Harmonizing both the curriculum and technology within the classroom will be a key challenge of the reform effort, especially in terms of pedagogical and infrastructure readiness.

5.9.2 From the Outside In

Outcome-based curriculum is intended to be flexible to the needs of society. Curriculum reformers should work closely with all sectors of Eritrea to establish an effective demand-response mechanism to identify skill-gaps and human resource needs. Curriculum should be adaptable and have provision for new activities that develop skills that respond to evolving workforce need in Eritrea.

5.9.3 Alternative Options for Reaching Same Outcomes

A caveat to curriculum reform is the timing of implementation of the curriculum vs. the readiness of the ICT infrastructure. As curriculum writers re-shape the national curriculum to integration of ICT across the curriculum, it will be essential that teachers have choice of instructional approaches to facilitate the same learning outcome for students. In other words the course syllabus should include: 1) a direct instruction option; 2) a student-centered instruction option; and 3) an ICT integration option. Providing the flexibility of choice during the pedagogical transformation period will help teachers develop good practices defined by the goals of reform.

5.9.4 Evergreen Model

Curricula should remain "evergreen." In other words, curricula should be flexible, and be able to respond to the changing market needs, student needs, and technology innovations. Reformers and curriculum writers should consider strategies for making

the curriculum flexible without the need for a national revision effort. Best practices of curriculum reform regionally and globally will help provide strategies for keeping the curriculum "evergreen."

5.9.5 Provide More Autonomy Regionally and Locally for Equity

Eritrea has nine ethnic groups, with widespread variety socially, culturally and geographically. Though a national curriculum is intended to, in part, act as a unifying element of the nations. However, the curriculum should be flexible to meet the needs of local communities in order to provide an optimal environment for equitable learning.

5.9.6 Authentic Learning

Authentic Learning provides opportunities for students to explore real-life issues and solve real-life problems. Authentic Learning is a student-centered learning structure that allows students to choose their topic of learning from the context of their local community and environment. (An example would be to investigate strategies for improved crop yield for the local farmers.) Curriculum reformers are encouraged to provide a framework for students to engage in Authentic Learning projects. These projects are very compelling for students, as they see them as being directly relevant to their families and communities. Authentic Learning projects are student-centered, outcome-based, and are supported by ICT in education.

5.9.7 Alternative Assessment

The new National Curriculum stresses a student-centered, outcome-based approach to learning. The added value to this pedagogical framework is the opportunity for students to develop and practice process-related skills: problem solving, critical thinking, research, collaboration, presentation, etc. Some of these outcomes can be assessed with traditional objective testing. However, many of the process skills will require alternative assessment strategies, such as presentations, peer critiques, and a portfolio of work. A portfolio gives evidence of the learner's abilities to produce work, a key skill in the workplace. ICT plays a central role in this portfolio assessment. Electronic portfolios are common in outcome-based learning environments. Curriculum developers are encouraged to provide a framework for introducing the practice and assessment strategies for alternative assessments.

5.9.8 Mentorship Programs and ICT Clubs

Mentorship programs and ICT clubs in schools provide frameworks for building school awareness and practice for ICT, and developing a sense of connection through school-to-work for students. Mentorship programs are an excellent strategy for:

- Establishing a venue for ICT momentum in schools.
- Engaging in activities that link schools with community
- Providing positive role models for children
- Engaging the private sector in education.
- Providing a mechanism for market appraisal.
- Develop workplace skills in students.

Mentorship programs can work both ways. Often, students with basic and advanced ICT skills can help facilitate small business to develop ICT capacity.

5.9.9 Community Engagement

Learning takes place in communities, and communities have a high stake in education. Providing an avenue of collaboration between the school and the community is very important, especially in terms of ICT and workplace skill development. Curriculum reformers should provide a mechanism for educators to engage the communities in various learning capacities. Community-based projects (authentic learning) are an excellent way to engage the community in a beneficial education process.

5.9.10   Assessment & Examination Reform

As mentioned earlier, assessment and examination reform will be important to accommodate and assess the objectives of the new curriculum. The new curriculum requires teachers to develop and practice alternative teaching practice, and student assessment and examination must make provision for these new practices. Included will be assessment tools such as student portfolios, project-based learning, and authentic learning activities that are directly relevant to real-world issues.

5.10 Technical Considerations

5.10.1   Security

All schools must provide adequate security for ICT equipment and infrastructure. A full assessment of facilities regarding security should be carried out at every school. Security appraisers will be provided guidelines for secure labs from the Ministry of Education. It's important to note that security threats are both hardware and software, and include nature (mice chewing wires).

5.10.2   Licensing

As mentioned earlier, ICT software licensing is a consideration on both micro- and macro-level, and implementation strategies should consider software licensing in terms of sustainability and future upgrades.

5.10.3   Classroom Configuration

As mentioned in the Pedagogical Considerations above, there are technical considerations for network installation in classrooms. Again, the "horseshoe" shaped configuration will provide ease of installation of wiring and movement around the room.

5.10.4   Pedagogical Rationale of Equipment Purchases

Though it seems that installing computer labs is the MoE strategy for ICT in all schools, and this may be appropriate for most schools, planners should always consider local context before purchasing hardware. Much waste has happened in this arena in other similar contexts as Eritrea. To minimize the problem of purchasing the wrong equipment for a particular school, educators (knowledgeable ICT teachers) should always review local purchasing plans to ensure that all pedagogical, infrastructure, and technical aspects have been considered.

5.10.5   Alternative Models

Technical planners have a variety of infrastructure and institutional challenges for effective integration of ICT in schools. If teachers are to be asked to integrate ICT

across the curriculum, then class access to the technology will be required. Fixed computers labs will require the teacher and the class to move to the lab for lessons. Thus, lab scheduling and demand will be a concern for directors and school staff. Some schools have experimented with a mobile computer lab to "bring the lab to the students."

5.10.6 Student Support Technicians

All schools will need technical support for troubleshooting and maintenance. As mentioned earlier, an organized Student Support Technician program is recommended strategy for supporting ICT in schools.

5.11 Installation of ICT in Schools

5.11.1 Coordination

The coordination of the installation of ICT in schools will be the responsibility of the ICT Unit.

5.11.2 Feasibility

The ICT Unit will develop a National feasibility plan. Included in this plan will be a country-wide installation strategy. It is suggested that the plan include three options for implementation: 1) a reliable and present electrical and telecommunications infrastructure; 2) an "imminent" infrastructure situation, where power and telecommunications capacity will be established within the term of Phase I; and 3) an indefinite infrastructure, where power and telecommunications are not planned during Phase I or in the near future.

5.11.3 Assessment

On-the-ground assessment must take place that will impact ICT configuration and installation. For example, some computer labs may need air conditioners or special security hardware. The ICT Unit will work closely with planners, the zobas, and schools to assess parameters influencing procurement and installation.

5.11.4 Procurement and Transport

The ICT Unit will work closely with the ESDP Project Management Unit (PMU) to follow all established procedures for ICT procurement and transport.

5.11.5 Installation

The ICT Unit will develop physical installation guidelines. Of particular importance will be the installation and testing of the LAN, and facilitating a local support strategy.

5.12 Long Term Sustainability

Long term sustainability of ICT programs will be a challenge. Measures taken today can greatly help to sustain the viability of ICT programs in the future. Institutionalization of ICT is a key factor in sustainability, and the following measures will help in this process.

5.12.1 Staff Technical Training

Training staff will be critical for long term sustainability. Developing staff ICT skills will help to institutionalize expectation of ICT and create a culture of ICT use, grounding the expectation of using ICT tools for standard operating procedures.

5.12.2 Network Use Policy

The MoE Network Use Policy will standardize ICT operations and use for all staff, raising awareness and institutionalizing expectations for ICT use throughout the sector. The Network Use Policy will provide the structure for all document classification and use in the Ministry, and help to streamline all processes.

5.12.3 Strategic Planning

Strategic planning will be essential for sustainability. Strategic planning provides a focus of discussion for ICT related policy and issues, and creates a mechanism that will guide staff towards defined goals, and assess the progress of activities aimed at these goals. The structure of a strategic plan provides a responsive framework for adjust of tasks and procedures important for maximizing success with minimal wastage.

5.12.4 Reliable Data Sources

Access to reliable electronic data will be essential for sustainability of ICT within the sector. Ministry databases must be robust, easy to access, and have reliable back-up systems. Furthermore, streamlined distribution of local surveys and collection of data will help planners respond to needs within the sector that are credible and relevant, minimizing the chance of embarking on stop-gap measures based on unreliable information. A ministry-wide WAN will help to facilitate accurate and reliable data sources. Other types of communication and transmission of data, such as satellite downlink and uplink, will be important as well.

5.12.5 Resources for Long-term Technical Support

Earmarking resources early to support long-term technical training for teachers and staff will be important for institutionalization of ICT. Increasing the capacity of the sector to respond to technical issues will help keep systems operational. Furthermore, expert consultations at critical junctures, such as when new systems are being planned and coming online or new procedures are being deployed will help to minimize wastage. A train-the-trainer model for technical support will help to increase overall capacity of ICT-related activities in the sector.

5.12.6 Integrate Processes

Whenever possible, the MoE should seek to integrate processes to minimize wastage. ICT-related curriculum development, staff training development, and pre-service teacher training are critical areas where collaboration among all stakeholders will be important. For instance, integrated databases such as staff and payroll data will help to ease burden on school staffing, and streamline payroll processes throughout the sector.

5.12.7 Local Involvement

Local involvement in school related ICT activities will be important to develop and maintain a social climate dedicated to sustaining ICT in schools. Local school strategic planning can facilitate community development around ICT issues, and the MoE should support planning in local communities, particularly for developing and implementing innovative practices for recurrent cost recovery and additional revenue for programs and equipment.

6 Strategy for Implementation

6.1 Strategic Planning

All sectors of education should develop a strategic plan. Department planners should consider how ICT might enhance the goals and objectives of the plan. The ICT Unit will assist by providing advice and suggestions.

6.2 Office of the Minister

All units within the office of the Minister of Education will be impacted by the rollout of ICT in the education sector. Each unit should begin planning sessions to review the current needs and constraints of operation, and how ICT could streamline tasks. ICT roles and responsibilities and terms of reference should be drawn up as required by policy. The Office should develop strategies for utilizing the MoE website to enhance goals of the department. The ICT Unit will provide guidelines for the planning strategy.

6.3 ICT Unit

6.3.1 ICT Infrastructure

The ICT Unit is the MoE body responsible for:
- Procurement of all ICT hardware and software for the entire MoE.
- Assigning technical specifications for procurement.
- Initiating pilot interventions to test new or alternative technologies.

6.3.2 Immediate Priorities

The ICT Unit will make a top and immediate priority of the following key capacity and sustainability components:
- Security and integrity of all MoE computers;
- Installation of a Ministry-wide LAN;
- Guidelines for ICT capacity planning for the MoE
- Establish a web-presence of the MoE.
- Develop a work plan for these activities, including staffing needs.

6.3.3 Second Priority

The ICT Unit will make a second priority of:
- Developing and implementing an appropriate training program for all MoE employees for network operations and integrity (security).
- Developing a Network Use Policy (NUP).

6.3.4 School ICT Feasibility and Facilities Installation
- The ICT Unit will lead the development of a national feasibility plan, including a budget, the specifications for the MoE WAN, and for the installation of ICT in schools.
- The ICT Unit will add (sub-contract), designate, and train a new Facilities Installation Team to configure and install ICT in schools.

6.3.5 ICT Unit Strategic Plan
- The ICT Unit will develop a strategic plan for the ICT Unit.
- The strategic plan will include the implementation plan for ICT in Education.
- Develop strategies for utilizing the MoE website to enhance goals of the unit.

6.3.6 Establish the MoE ICT Steering Committee
- The ICT Unit will establish and convene the MoE ICT Steering Committee as required by the National ICT in Education Policy.
- The Unit Head of the ICT Unit will lead the development of the MoE ICT Steering Committee Mission and Charter framework for discussion and ratification during the first session of the meeting.

6.3.7 ICT Research and Development Team
The research and development team will assist all departments in identifying and implementing ICT innovations to increase capacity and productivity in the MoE.
- The ICT Unit will develop the terms of reference for an ICT Research and Development Team.
- The ICT Steering Committee will review, discuss and ratify the R&D terms of reference.
- The ICT Unit will detail appropriate staffing of the R&D team and develop a work plan.

6.4 Department of General Education

6.4.1 Strategic Planning
The Strategic Plan for the DGE should:
- Develop a phased approach to introduction of the new ICT-enhanced curriculum.
- Consider electronic book publishing.
- Ensure equity considerations are throughout the new curriculum.
- Include a provision for alternative assessment in the new curriculum.
- Develop cost-effective extension curriculum that align with market needs.
- Develop strategies for utilizing the MoE website to enhance goals of the department.
- Develop the framework and strategy for an online community of students.

6.4.2 Curriculum Planning & Development
ICT in education has universal implication, and must be considered at all levels. This is particularly true with curriculum, as it is the substance of education, and integral with the future of Eritrea.
- A basic ICT literacy curriculum will be developed for all levels.
- All frameworks for curriculum planning and development will include the consideration of an ICT component.
- The component must be flexible by offering ICT-inclusive lesson options for instruction based on the availability of ICT infrastructure in the local school.
- Develop guidelines for teacher training for ICT integration in schools.
- A rollout plan, including pilot interventions will be developed.
- External consultants will assist in this process.

- Include satellite downlink technology as a strategy for national distribution of materials for pilots and programs.
- Staff and support pedagogical resource centers as primary place for housing resources and venues for training of curriculum related activities.

6.4.3 Monitoring & Quality Assurance

Performance assessment of teachers is essential to ensure that teachers are effective and innovative in their practice. The new curriculum of Eritrea aims to be dynamic in nature, and the teachers must demonstrate their skills and aptitudes to expand their practice in this new curriculum environment. As ICT will be an integral aspect of education in Eritrea, performance evaluation of teacher must align with these new outcomes. Therefore, the Monitoring & Quality Assurance Division of the DGE must:

- Work closely with curriculum developers and teacher development units to ensure performance indicators align with the new curriculum, in particular with the ICT aspects of teaching and learning.
- Develop a phased approach to teacher performance assessment for the utilization of ICT in teaching and learning to allow for professional development of teachers and the establishment of appropriate ICT infrastructure.
- Plan for a phase-in of teacher assessment of ICT for teaching practice.
- Requirements for demonstration of technology integration in teaching and learning should be expected of teacher, and integrated into teacher annual performance evaluations.

6.4.4 Assessment & Examination

- The National Exam will be revised to reflect the student-centered, outcome-based approach of the new curriculum.
- Other teaching instruments will be reviewed and aligned with the new curriculum expectations.

6.5 Department of Technical Education & Vocational Training

6.5.1 Strategic Planning

The strategic plan for the TEVT should consider:
- Developing a clear policy to include ICT considerations.
- Developing a strategy for market appraisal that includes employing ICT tools to facilitate the process.
- Implementing a market appraisal mechanism.
- Liaising with private schools to augment public school ICT programs.
- A strategy and budget for ICT in TEVT schools, including Skill Development Centres.
- Program interventions.
- Supporting the "comprehensive" model for secondary education.
- Developing a school-to-work program.
- Develop strategies for utilizing the MoE website to enhance goals of the department.

6.5.2 Curriculum Planning & Development

- Conduct a review and develop a strategy for ICT as a component of Technical Education, including teacher training.
- Conduct a review and develop a strategy for ICT as a component of Vocational Training, including teacher training.
- Standardize ICT skill straining.

6.5.3 Monitoring & Quality Assurance

- Supervision Unit will develop a plan to integrate ICT-related performance appraisal for teachers.
- Assessment & Examination will review the examination content and process to respond to ICT-related program developments.

6.6 Department of Adult & Media Education

6.6.1 Strategic Planning

The strategic plan for the AME should consider:
- Developing a clear policy to include ICT considerations, particularly alternative technology solutions for remote areas of Eritrea.
- Introducing the basics of ICT in AME programs: awareness and use.
- Expanding programs through Distance Learning, including teacher education.
- Develop strategies for utilizing the MoE website to enhance goals of the department.

6.6.2 Curriculum Planning & Development

- Evening program utilizing distance learning
- Explore expanding fee for service programs, including ICT telecentre utilization in schools.
- Include satellite downlink technology to support programs in remote ares.

6.6.3 Media Education

- Work closely with the ICT Unit to explore alternative technology models for ICT-assisted instruction for remote and isolated areas.
- Investigate ICT-related funding for enhancement and expansion of the radio program.
- Development of video production and educational TV transmission center.
- Consideration for a variety of media, including television, radio, audio cassette, satellite downlink technology, computer games, virtual environments, and any other media to support programs.

6.6.4 Monitoring & Quality Assurance

- Supervision Unit will develop a plan to integrate ICT-related performance appraisal for teachers.
- Assessment & Examination will review the examination content and process to respond to ICT-related program developments.
- Pedagogical Services Unit will provide relevant pedagogical ICT-related support and training.

6.7 Department of Research & Human Resource Development

6.7.1 Strategic Planning

The strategic plan for the RHRD should consider:

- Making a top priority of significantly increasing capacity of EMIS
- Unifying all personnel records in an up-to-date database.
- Streamline personnel data gathering and processing to reduce redundancies in the system.
- Developing comprehensive teacher incentive strategy for professional development and advancement.
- Develop strategies for utilizing the MoE website to enhance goals of the department.

6.7.2 Research, EMIS & Statistics Division

- Develop a strategy for expanding the needs and staffing of EMIS.
- Strengthen EMIS capacity through new equipment and software purchases, addition of technical staff, and external consultants.
- EMIS will use the ICT infrastructure for all activities.
- Work closely with the ICT Unit in developing a streamlined data gathering capacity.
- Include satellite downlink as a strategy for deploying questionnaires.

6.7.3 Human Resource Development Division

- Conduct ICT-enhanced distance learning pilot in towns with local Internet point of presence (POP).
- Develop a "train-the-trainers" national basic ICT and pedagogical training for teachers.
- Work closely with database developers (EMIS and consultants) to ensure the new database will meet the needs of HRD.
- Work closely with the ICT Unit in developing the MoE website concept and team.

6.7.4 Project Management Division

- Develop a process for identifying and utilizing ICT innovations.

6.8 Department of Administration & Finance

6.8.1 Strategic Planning

The strategic plan for the DAF should consider:

- Developing a process for identifying and testing ICT innovations.
- Develop strategies for utilizing the MoE website to enhance goals of the department.

6.8.2 Finance Division

- Utilize and train staff on up-to-date budget development software.
- Utilize and train staff on up-to-date accounting software.

6.8.3 Human Resource Management Division

- Integrate an electronic system of staffing assignments.
- Integrate an electronic filing and retrieval system for all MoE documents.

6.8.4 General Services Division

- Utilize and train staff on up-to-date ICT tools for all aspects of the General Service Division: procurement; stores, production and printing, and supply services.

6.9 Regional Offices

6.9.1 Basic Education Unit

- Use ICT for supporting curriculum pilots, such as through satellite downlink.

6.9.2 Secondary Education Unit

- Coordinate pedagogical programs for local secondary schools

6.9.3 Finance & Administration Unit

- Integrate both staff and payroll data with databases that are developed nationally

6.9.4 Human Resource Development Unit

- Coordinate Distance Learning program for middle school upgrading, and other related programs.

6.9.5 Sports, Culture, & Health Unit

- Use ICT clubs to link activities in schools with other activities in the community related to sports, culture and health.

6.10 Pedagogical Resource Centers

- The MoE will use pedagogical resource centers as primary places for teachers and local staff to access resources, computers, and training.