

Foreword by the Ministers of Education

As we move towards a knowledge-based development paradigm, as stipulated in Namibia's Vision 2030 *"Integrating ICT education and training into education and training system"*, issues of access to the local and global pool of knowledge and information become paramount. The National Information and Communication Technology Policy identifies physical infrastructure and appropriate human capital as the cornerstones for the development and integration of ICT in our society and culture. The Education and Training Sector, long-seen as the torchbearer for capacity development in Namibia, created the ICT Policy for Education to enhance the use and development of ICT in the delivery of education and training.

The five distinct development areas for the use of ICT are:

- (1) Investigation and Development of Appropriate ICT Solutions;
- (2) Deployment of ICT;
- (3) Maintenance and Support of ICT;
- (4) ICT Literacy; and
- (5) ICT Integration.

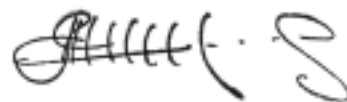
ICT Integration is a complex process and all education stakeholders require clear guidance as to what is expected of them throughout this process. This policy is our first step towards providing this guidance. Due to the rapidly changing nature of ICT, it is imperative that this policy must be open-ended to ensure it does not become obsolete before it is even adopted. In order to ensure clear guidance and relevance, detailed Implementation Plans, Curricula, Teachers' Guides, Deployment Criteria Guidelines, and Technical Standards should be developed and maintained as an addition to this policy.

ICT provides a great deal of advantage in the delivery of equitable, quality education, thereby providing an opportunity to improve the lives of our people. The need to use new technologies to raise the quality and efficiency of education cannot be over emphasized. It is imperative that we expose our children, parents, and teachers to ICT to improve the quality of education and technical proficiency of our human resources, thus leading to increased productivity and accelerated development. We must also prepare our citizens to adapt to the global economy and participate in electronic commerce. In addition, we must provide our children with a greater understanding of other peoples and cultures, thus defending our renewed legacy of peace and tolerance.

We have many partners working with us in each of these areas. The broad participation throughout this process is a testament to the inclusive nature of this policy. This ICT Policy for Education is intended to coordinate the appropriate development, efficient delivery, and quality use of technology to ensure ICT integration for excellence and equity in education.



Honourable Minister Nahas Angula
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The Vision of the ICT Policy for Education

The ICT Policy for Education is to support Vision 2030 call for constructive global partnerships founded on common interest, obligation, commitment, and equality premised on good governance, democracy, and human rights.

The Mission of the ICT Policy for Education

The mission of this policy is to articulate the relevance, responsibility, and effectiveness of integrating ICT in education with a view to meeting the challenges of the 21st century.

To this end, the policy draws on worldwide knowledge and experience to describe and realise the:

- *Possibilities* of ICT for education;
- *Constraints* for turning this potential into effectiveness; and
- *Scenarios* of applying these capacities in different environments.

Purpose of the Policy

The purpose of this policy is to prepare all Namibia's learners, students, teachers, and communities of today for the world economy of tomorrow.

Introduction

The Government of the Republic of Namibia recognises education as one of the key inputs for economic development, human welfare, collective progress, and environmental protection. The Namibian Government has long shown that education is a major priority, highlighted by the considerable, long-term financial and political commitment since independence. However, as in many parts of the world, the Namibian education system has continually struggled to simultaneously expand equitable access, guarantee uniform quality, provide teacher education and support, and leave room for diversity of results.¹

The educational project is a complex one and people are fundamental throughout the educational process. Teachers, learners, principals, schools, content, assessment, resources, school libraries, textbooks, management and administration, communities, and politicians all have key roles to play. Each of these stakeholders and components have an affect on each other. Moreover, this list is by no means exhaustive. It simply serves to highlight the complexity involved in developing and delivering educational change. Throughout the rise of mass schooling over the past century, any attempt to achieve the dual goals of equity and excellence has demonstrated the important role of teachers. Simply put, teachers are essential to the educational process.

Beyond teachers, the delivery and transformation of knowledge must leverage other interventions. The school system has proven remarkable in its contribution to the fulfilment of basic learning needs, to skills development, to scientific progress, to reproduction of the social order, and to the safeguarding and development of traditions.

¹ Ministry of Education, Sport and Culture, *Strategic Plan 2001-2006*

Notwithstanding the relative success of the education sector, the new century brings a fresh set of challenges and demands for which educational institutions, in their present form, are not prepared. Even the best of these educational institutions have served a different set of demands for a different age. These challenges in the context of the Information Age have put educational institutions across the world under tremendous pressure to provide every educational institution (if not every learner) with information and communication technologies (ICT), including computers and their accessories and connectivity to the Internet. At the very least, educational institutions are expected to establish and utilize fully equipped media centres containing more than just printed materials and are required to provide access to global information by electronic means. The pressures are coming from stakeholders, educational partners, vendors, parents, businesses, and technology advocates. Namibia is no exception.

International experience shows that integrating technology effectively into learning systems is extremely complicated. It involves a thorough analysis of educational objectives and changes, a realistic understanding of the potential of technologies, considering the pre- and co-requisites of successfully implementing ICT for education, and the prospects of this process within the dynamics of educational change and reform.

In fact, acquiring the technologies themselves, (no matter how difficult and expensive the process) may be the easiest and cheapest element in a series of elements that eventually could make these technologies sustainable and/or beneficial.

This policy is an attempt to outline the issue of ICT for Education in the context of the educational sector's struggle to be relevant, responsive, and effective in meeting the challenges of the 21st century. This Policy describes what we want to achieve with ICT in education and what must be in place to achieve it. It does not describe how to achieve it – that is the role of the accompanying Policy Implementation Plan.

Namibia recognises the importance of Information and Communication Technology (ICT) as a tool to the development of the country. ICT has a role to play in education both directly as a subject and indirectly as a tool to assist in educational delivery and management.

Used appropriately, ICT can bring many benefits to the classroom and the education process. This usage is as a tool to provide new opportunities for teaching professionals delivering education. Some examples are:

- Offering the opportunity for more student-centred teaching.
- Giving at risk students' greater opportunities. E.g., Students who have problems with authority figures perceive computers as neutral.
- Greater exposure to vocational and workforce skills for students.
- Greater opportunity for teacher-to-teacher and student-to-student communication and collaboration.
- Greater opportunities for multiple technologies delivered by teachers.
- Creating greater enthusiasm for learning amongst students.
- Access to a wider range of courses (both by subject, level and lifestyle choice).
- Provide teachers with new sources of information and knowledge.
- Preparing learners and students for the real world.
- Providing distance learners country-wide with online educational material
- Providing learners with additional resources to assist resource-based learning

In recent years, a number of national and international organizations have developed educational ICT partnerships throughout Namibia. This policy promotes the efficient coordination of these partnerships.

If government leaders, and the Ministries of Education in particular, do not take steps to intensify and strengthen the use of information and communications technology (ICT) in our academic institutions and schools, a generation of children - and a generation of adults as teachers - will be put at a colossal disadvantage with consequences and costs that will be difficult to reverse.

Background

In 1995, the Ministry of Basic Education, through the National Institute for Educational Development (NIED), developed a national policy for ICT in Education in Namibia (NIED 1995). The policy was revised in 2000. This brief but detailed document set out the objectives for developing an ICT Policy in Education and expounds on key issues regarding the strengthening and exploitation of ICT courses in schools including the utilization of ICT. The policy identifies the justification for introducing ICT in educational institutions.

The document also enlists the policy options, software, training, hardware, and qualitative estimates of costs, for each rationale, which are further broken down into aims, objectives, and strategies for both the short-term (three-year) and the long-term (five-year).²

In 2004, a mixed working group based in the two Ministries of Education, was formed to provide an updated policy, (the current document) reflecting the developments in pedagogy, research, technology, and partnerships that have taken place over the last few years.

A number of national strategic documents and policies have recognised the need to develop ICT within the Education sector. This document should thus be read and used in conjunction with:

- Vision 2030
“Integrating ICT education and training into education and training system”
- NDP2
“Coordinating with the Ministry of Basic Education, Culture and Sport to introduce Computer Literacy as a compulsory subject in schools”
- Strategic plan for The Ministry of Basic Education (2001 – 2006)
“Manage and use modern information technology to communicate and share information”
- National ICT Policy
“It is critical to emphasise training of teachers who will teach ICT-related subjects”
- ICT Strategy for Ministry of Higher Education (Draft)
“To increase the nations ICT skills”

² National ICT Policy for Namibia

- Public Service Information Technology Policy
“Introduce Information Technology at junior secondary school level”
- Information for Self-Reliance and Development – A policy framework for libraries and allied information agencies for Namibia.
“IT Literacy will be widely promoted among the population”

Definition of ICT

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

Policy makers and practitioners tend to question the potential of technology. However, these questions are difficult to answer because technologies are very different in their potential and use. The potential of different technologies depends on how they are utilised. If technology is used for representation and demonstration only, investment in computers and Internet connectivity may not be justifiable. On the other hand, networked computers and connectivity to the World Wide Web can best achieve the potential for interactive and mutual learning.

ICT will not replace teachers. They constitute one fundamental component of this education model—complementing and enriching traditional educational institutions, educational delivery systems, and instructional materials. In this sense, ICT contributes to the whole system of knowledge dispersal and effective learning.

Overall Policy Goals

The overall policy goals are to:

1. Produce ICT literate citizens;
2. Produce people capable of working and participating in the new economies and societies arising from ICT and related developments;
3. Leverage ICT to assist and facilitate learning for the benefit of all learners and teachers across the curriculum;
4. Improve the efficiency of educational administration and management at every level from the classroom, school library, through the school and on to the sector as a whole;
5. Broaden access to quality educational services for learners at all levels of the education system; and to
6. Set specific criteria and targets to help classify and categorize the different development levels of using ICT in education.

These are sizeable objectives. To achieve them will require single-minded vision, commitment, and stamina from all sectors and government. These goals can be best achieved if government believes ICT is important and embrace the idea of integrating ICT in the education sector by strongly committing towards ICT in education as one of a number of strategic initiatives.

Our recommendation to Government is that they should encourage the education sector to start and/or continue using the technology. More specifically, Government must take the lead and proclaim it a national priority to use ICT in all educational institutions.

This is less an issue of identifying and finding extra resources. It is much more a matter of making it simple to the Ministries of Education, the main national agencies, stakeholders, and partners in the education service (including all the teacher education institutions, examination bodies, the National Institute for Educational Development [NIED], the Information Technology Society, Civil Society, teacher associations, governors' organizations, and the local authorities) that they need to co-operate in realizing a strategy which is spelt out to all interested parties in a logical way. That is, every academic institution, school, and local community must be encouraged to develop, implement, and institutionalise ICT for education across the country.

We do not see any "quick fix" programme that will achieve these objectives instantaneously. It is categorically not that simple. We envisage a logically managed set of initiatives that, if initiated in parallel, will achieve the desired long-term objectives. Any realistic Government strategy for ICT for education will consist of mainly small and low-key initiatives that, if consistently sustained, will lead to comprehensive progress over a 5-10 year period.

Specific Educational Goals

This ICT Policy for Education is concerned with providing clear objectives and basic competencies for learners, students, and teachers to achieve key ICT knowledge and skills. As a matter of equity and quality, the ICT Policy for Education requires curricula to be maintained which indicate exactly what is expected of learners, students, and teachers in regards to ICT in Education. These curricula must also provide guidance for how teachers must clearly present the relevant assessment criteria to learners and students. These curricula should also include cross-curricular "opportunities" to provide Ministry guidance to educational institutions, which have ICT access.

These educational goals put more emphasis on the pedagogical use of ICT as an integrated tool in the teaching-learning process at all levels in the educational system. Competence in the use of ICT by teachers, students, learners, and community members must be developed through a long period of guided practice and investigation. The activities and goals of the Ministries of Education will support this purpose.

Framework and Management

An Executive Committee, consisting of membership from both Ministries of Education, will manage this policy. A Steering Committee was established to coordinate implementation of the policy.

The role of the Executive is to:

- Administer the Policy;
- Approve or reject recommendations made by the Steering Committee;
- Publish performance measures to address levels of Identification and/or Development of appropriate ICT for Education, Distribution and Delivery of ICT, Maintenance and Support of ICT, ICT Literacy, and ICT Integration; and to
- Report annually on the Policy.

The Executive group will report to the two Ministers of Education.

The role of the Steering committee (under guidance from the Executive) is to:

- Establish an efficient framework for co-operation between line ministries, stakeholders, partners, educational institutions, etc, to ensure the successful implementation of ICT for Education for Namibia;
- Make recommendations to the Executive Committee with regard to mutually agreed standards of acceptance, cost and quality of operations, services, support and maintenance, teacher and staff training, institutional development, capacity building, research, and public awareness within the ICT Policy Framework; and to
- Coordinate national ICT activities.

Development Levels

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

Level 1

A small computer room is available. This may be anything from two to a dozen computers. The computers are used for teaching ICT skills such as basic computer use, learning how to use a word processor, introduction to the Internet and finding knowledge. The staff have the skills to retrieve information, prepare documents, use school management software, and develop their skills. One or two staff will have a minimum basic ICT Literacy qualification. Students will spend about one hour a month using a computer. The site will have some audiovisual/broadcast facilities.

Level 2

All level 1 attributes apply. In addition, all teaching and administrative staff should have reasonable access to a computer (at least 1 computer for every 5 staff and 1 to 10 for learners/students) and are able to use the Internet and e-mail, as well as a word processor. The site is connected to the Internet. Learning materials are downloaded and occasionally created by

teaching staff. Significant communication and administration with the rest of the parent Ministry is done via e-mail and web services. Students will spend about one hour every two weeks on the computer. At least two of the site staff will have an ICT qualification. The site will have a classroom equipped with a computer and projector system and/or the ability to display audio-visual materials to students.

Level 3

Use of ICT underpins significant proportions of the work. All students have reasonable access to a computer (better than 1 computer per 10 students), and all staff have access to a computer (better than 1 computer per 3 staff). The site has an Internet connection suitable for the number of users. All students are able to use a computer, communicate by e-mail, find information using web-based systems, create output using a word processor e.g. assignments. Learning materials are downloaded, created, and uploaded by teaching staff. Over a third of the communication and administration with the rest of the parent Ministry is done via e-mail and web services. Some computer based training materials are used to support teaching. 30% of staff will have some ICT qualification. Students will spend about two hours a week using a computer. The site will have one or more classrooms equipped with a computer and projector system and/or the ability to display audiovisual materials to students.

Level 4

Use of ICT underpins much of the work. All students have reasonable access to a computer (better than 1 computer per 5 students/learners), and all staff have access to a computer (1 computer per 1 member of staff). The site has a reasonable (fixed) Internet connection in relation to the number of students/learners and staff. All students/learners are able to use a computer, communicate by e-mail, find information using web-based systems, create output using a word processor, spreadsheet and presentation software e.g. assignments. Learning materials are downloaded and created on Computers by teaching staff. Over a half of the communication and administration with the rest of the parent Ministry is done via e-mail and web services. Computer based training materials are used to support teaching. Modelling software is available to allow student to experiment and investigate, along with Computer Based training software to assist in supporting the teachers. Over half the staff will have an ICT qualification. Students/learners will spend over one hour a day using a computer. The site will have significant number of classrooms equipped with a computer and projector system and/or the ability to display audiovisual materials to students.

Level 5

This is normally reserved for an educational facility with an ICT focus. All students/learners and staff have good access to a computer. Most staff will have an ICT qualification. A significant number (more than 50%) of staff will have an advanced ICT qualification. ICT subjects such as programming, database design and usage, system configuration etc. will be taught. A good Internet link will be in place. Computer based training will be commonly used to support teaching using a blended learning approach. Most communication and administration will use ICT. Most of the work done by students/learners will be done using computers. Students/learners will be obtaining employment in the ICT and related industries. Students/learners will spend at least

four hours a day using a computer. The site will have significant number of classrooms equipped with a computer and projector system and/or the ability to display audiovisual materials to students.

Desired Levels

In order to address the difficulty of addressing the twin goals of equity and excellence, this policy aims to link the attainment level to the closeness of the learners to entering the workforce. For example, learners in pre-service teaching establishments are about to enter the workforce and will be passing on their skills to others. This makes them a higher priority than learners in primary schools that have many years ahead with further opportunities to develop their ICT skills. The Implementation Plan which accompanies this ICT Policy for Education articulates the activities which will lead us to these desired levels. The Implementation Plan addresses the Investigation and Development of ICT for education, the Deployment and Delivery of ICT across the education sector, the required Maintenance and Support of ICT, ICT Literacy, and ICT Integration. Each of these areas must be developed with the following desired development levels in mind:

All Pre-service teacher-training facilities should be at least level 4.

All schools with secondary grades should be at least level 2.

All Tertiary Education establishments (University, Polytechnic, etc) should be at least level 3 (4 for certain faculties).

All Adult Education centres should be at least level 3.

All Primary schools should be at least level 2.

All Libraries and Community Centres should be at least level 2, progressing to levels 3 or 4 in the case of libraries used in secondary schools and tertiary education establishments.

All Vocational Training Centres should be at least level 2.

Any major section of an institute dedicated to computer studies should be level 5. E.g. ICT Departments in Higher Education.

All schools at level 2 or above must timetable in usage of the ICT in order to ensure all students/learners gain exposure to ICT, and the facilities are not left idle.

Priorities

Progressive improvements in the levels of educational institutions will take time, even with plentiful resources. So it becomes necessary to define criteria for the priorities in which sites receive equipment and training. As discussed above the imminence of students/learners entering the workforce, and the impact they will have on others provides an overall basis for selecting priorities. The priorities are:

1. Colleges of Education and related in-service programmes
2. Schools with secondary grades
3. Teacher education programmes at tertiary institutions
4. Vocational training
5. Primary Schools, Libraries and Community Centres, Adult Education Centres, and Special Needs Education

Within this overall structure, the priority will be to develop ICT based on a number of factors. A model will be developed, evaluated, maintained, and used that will guide the Ministries of Education and their partners in selecting priority sites for ICT investment. Factors such as Cluster Centre Status, partnerships with distance learning organizations, student/learner teacher ratios, power and telecommunication availability, teacher skills profiles etc. will be used. The model's operation will be transparent (published) and open to public scrutiny and review.

In order to empower teachers, priority will initially be given to providing access for teachers before installing systems for learners and students. This will give teachers an opportunity to develop e-confidence and to use the tools to support teaching thus producing sufficient numbers of qualified teachers to meet these challenges.

Priorities must show no regional bias and will be based on the proportion of students per region i.e. if a region has 10% of the students then it gets roughly 10% of the resources.

ICT Services

The following services will be implemented to ensure the following key areas are addressed effectively: Identification and/or Development of appropriate ICT for Education, Distribution and Delivery of ICT, Maintenance and Support of ICT, ICT Literacy, and ICT Integration.

Maintenance and Support

Maintenance and Support ensures all ICT labs and other ICT resources remain secure and working. Without this service, failures in equipment will bring about failures in services, and in turn the failure of the policy. It will also result in low morale and cause people to reject the technology. Timely and effective maintenance services must be in place to make our use of ICT efficient and value for money.

Networking

Networking provides for local (LAN) and wide area network (WAN) services, which ensures communication between clients, servers and ultimately between people. All educational sites are to be connected with the aim of increasing communication, improving efficiency, and widening the sphere of influence and knowledge of the site.

Digital Library

A Digital Library provides educational materials to support the curriculum, the administration, and the training of the education community. The digital library will be the channel for every education consumer to retrieve the knowledge needed. Content within the library will only come from 'trusted' and/or approved sources.

Digital Content Creation and Evaluation

Digital Content Creation allows for the production of materials relevant to the Namibian curriculum and suitable for Namibian learners. Evaluation ensures all digital content is graded appropriately so the education community knows its quality and relevance in relation to the national curriculum.

E-Mail

E-mail allows all education stakeholders (learners, students, teachers, administrators, etc.) to communicate efficiently. Every education consumer will be entitled to an e-mail account. E-mail will be promoted since it provides predictable costs, allows for sending and receiving of rich content documents, is flexible, is digital so as to ensure no quality loss on transmission, and scales easily for efficiency savings.

Security

Digital Security protects the users, the infrastructure, and the resources. Such protection is not just physical; it extends to the digital arena where protection from 'information' such as pornography is required. The security service will also be required to authenticate and authorize people and resources. This is needed to ensure only authorized people can read and change confidential information, and to confirm identities when providing authorization. A security policy for all services will be maintained as part of the security service.

Web Access

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

Training and Support

People involved in integrating technologies into the teaching/ learning process have to be convinced of the value of the technologies, comfortable with them, and skilled in using them. Therefore, support orientation and training for *all concerned staff* in the strategic, technical, and pedagogical dimensions of the process is a necessary condition for success.

Training and Support for teachers, principals, support staff, trainers, and education stakeholders are essential. Training is only the first step in this service. A robust and supportive post training service will be required. This will be essential in the initial stages of implementing the policy when cultural and behavioural changes are required within the education community.

Improved Management Systems

Compared with any other national activity, the education sector is huge and complex. It involves educational institutions all over the country, teachers, and administrators in large numbers, and students and learners of every age, who can reach up to 30% of the population. This is an enormous sector to manage and maintain, and for which to ensure quality of input, process, and output.

- Recent reforms within the education endeavour have resulted in observable successes in making educational opportunities more accessible and equitable and the teaching/learning process more effective. For example, expanding educational opportunities means more schools in isolated rural areas and more diversified modes of delivery.
- Aiming for “(Towards) education for all” means including students from underserved populations who require special measures to reach and have special needs to meet.
- The accent on learning requires setting reliable and measurable standards, and attending to individual differences.
- Decentralization and delegation of decisions to regional, district, and local levels require better information systems and management procedures.
- Involvement of more stakeholders in the education process (parents, employers, unions, political parties, partners, etc.) is resulting in more transparency and accountability.

These developments demand a consistent flow of information and force the education sector to be managed better and more efficiently.

Historically the education sector has been criticised, as education systems have been slow in exploiting the power of technology. Many educational institutions and systems have introduced simple management and statistical information systems; but this should be only the beginning. The same elements of computing and telecommunications equipment and services that made businesses more efficient and cost-effective can be applied to schools and school systems to enable principals and superintendents to streamline operations, monitor performance, and improve use of physical and human resources.

Technology can be powerful in driving and managing new approaches to learning that involve more student interaction, more connections among schools, more collaboration among teachers and students, and more involvement of teachers as facilitators. These needs are especially critical in self-study, distance education, and e-learning settings and many platforms have been developed to meet such needs.

Efforts must be made on developing and ‘liberating’ the current information management systems such as EMIS. New technologies like Geographical Information Systems should be introduced, developed, and integrated to help in decision-making.

Records management and information management systems in education must, like all other systems in government, be compliant with established record management principles, and enable migration and long-term preservation of the information and data. These systems should be compatible with international standards and data export interfaces.

Curriculum

The development of specific ICT Curriculum ensures a relevant and appropriate curriculum for ICT subjects, and suitable guidance for the use of ICT in all other areas of the curriculum. Curriculum should promote skills of accessing, managing, and processing information; collaborative working skills; problem solving; and learning to learn concepts. The curriculum must be explicit to provide guidance to all teachers.

Monitoring and Evaluation of ICT in Education

A detailed Monitoring and Evaluation Plan is essential to measure, evaluate, and research the impact of this policy and issues relating to it about the effect and effectiveness of using ICT within the education community.

Staff Training

Different kinds and levels of training are required for staff and other stakeholders. Much of this support will take the form of pre- and in-service training. The aim of training is to assist people in handling the changes in skills, attitudes, and understanding that this policy requires.

Training needs will be identified and triggered through staff appraisal meetings, implementation of new systems, and upgrades in current system. All staff is expected to receive ICT training and to take full advantage of their pedagogical applications in their classrooms.

In-service training is the key to improving skills and confidence in the use of ICT within the teacher profession. To repeat, on the job training is critical to enable teachers to become competent in and receptive to ICT. As a matter of urgency, a programme must be devised which will ensure training is offered for all teachers.

In addition, there are other initiatives, which can support teachers to train “on the job”.

When teachers have access to their own computers, they rapidly become competent and confident at utilising ICT. Any time spent at home with a computer is invaluable in staff development terms. We suggest that Government should contemplate some form of income tax allowance regulation to allow full tax breaks for teacher ownership. Ensuring that an increasing number of teachers have access to a computer at home will also help mitigate the problem of how teachers can find the non-contact time to prepare for contact teaching.

Teachers play a significant role in developing knowledge and skills, which are crucial in the social and economic development of the country. In a rapidly changing technological world, skills in retrieving and using information accessed through technologies have become a demand in daily lives of teachers and students. Therefore, the preparation of teachers in using and infusing technology has become a crucial aspect of the teacher education curricula (pre and in-service teacher education).

Upon completion of their studies, teachers should be able to demonstrate the ability to operate a computer system to utilise software to teach the curriculum; to apply current instructional principles; and to employ appropriate assessment practices to the use of ICT.

Pre- and In-service Training for Teachers

Teachers should have confidence in using a computer and other ICT and should be able to search for, retrieve, prepare, and present educational materials using a computer. Teachers must be able to communicate using e-mail, must understand the use of ICT within education delivery, what it is good for, what it is poor at doing. The knowledge and skills on how to use technology as a tool to support learner-centred teaching, continuous assessment, and other forms of interactive learning are imperative.

Training for Pre-Service Lecturers

Pre-service lecturers must have confidence in using a computer and other ICT. They should be able to search for, retrieve, prepare, and present educational materials using a computer and other ICT. They must be able to communicate using e-mail. An ICT qualification is desirable. They should understand the use of ICT within education delivery, what it is good for, what it is poor at doing. They must understand, be able to demonstrate and able to use the different ways of using ICT within the curriculum (ICT Opportunities).

Training for Principals

Principals are required to have significant understanding of the role of ICT in education and the ICT Policy for education. They must have confidence in using a computer. They should be able to search for, retrieve, prepare, and present materials using a computer. They must be able to communicate using e-mail. They must be able understand what the various management and administrative ICT system do.

Training of School Advisors and Inspectors

In order for advisors and inspectors to carry out their functions effectively, they too need to be properly trained in ICT. All advisors and inspectors of the education service need to be equipped to recognize and appreciate effective use of ICT in schools. It will cost little to ensure that a far greater critical and potentially creative facility is built into the inspection system. This will not only benefit the schools: in addition, well-informed reporting will be essential information to the Ministry about the progress of its strategy.

Training for Administrative Staff

They must have confidence in using a computer and other ICT. They should be able to search for, retrieve, and prepare materials using a computer and other ICT. They must be able to communicate using e-mail. They must be able to use and operate the various management and administrative ICT systems. Administrative staff represents the first line in the maintenance and support service cycle. They must be trained in simple systems skills to enable basic troubleshooting and operation of computer systems. Each site must have at least one person with such skills.

This training would also include staff at libraries and community resource centres, but with a less emphasis on educational management systems.

Training for ICT Trainers

This group must have higher competencies and skills than their target students/learners. Beyond this, they must be able to deliver training in these subjects, evaluate performance, and monitor the development of the trainee.

Curriculum

There are three aspects to the role of ICT in the curriculum. Firstly the curriculum for ICT skills and knowledge, secondly ICT as a curriculum subject, and thirdly the curriculum for the usage of ICT within subjects other than ICT. In this policy document, we shall refer to them as ICT Literacy, ICT as a subject, and Cross Curricular ICT respectively.

ICT Literacy Skills

Guidelines for ICT literacy skills by level of learning will be maintained. All learners will be expected to have basic ICT Literacy before they finish their secondary level education. (See the item on ICT Literacy later in the policy)

ICT as a Subject

For more advanced technical literacy skills, curriculum for Computer Studies and for Information Technology will be maintained for the explicit study of ICT. This policy highlights that the fast changing nature of ICT means the ICT curriculum will need to be reviewed frequently if it is to stay relevant.

Beyond this, the higher education and vocational training community will provide training using NQA and/or industry-recognised curriculum.

Cross Curricular ICT

A guidance document on the general use of ICT in all curriculum activities will be maintained. Individual subject curriculum will also be adjusted to reflect the role of ICT in teaching the subject. Documents listing ICT opportunities within each subject, and in general, will be created and maintained.

Teacher education

The curriculum used for pre-service training of teachers must be adjusted in the light of the other curriculum changes. It must also be reviewed to integrate the use of ICT specifically with pre-service training in mind.

Content development

Content is one of the most forgotten areas, but evidently the most crucial component. Content software is integral to the teaching/learning process and must be developed. Depending on the number of schools using the materials, the unit utilization cost may be very high. This question of whether to acquire or create may be answered in different ways for different available materials and different instructional units. Ideally, the aim should be to:

- Acquire, as is, when suitable and cost-effective;
- Acquire and adapt when not exactly suitable but cost effective; and
- Create when no suitable or cost-effective materials are available.

- Create local Namibian content wherever the need is perceived, in particular in the fields of history, social studies, geography, language, and literature.

To follow this decision chain, four interrelated mechanisms are needed:

- Reliable information on available audio, video, and digital materials, as well as relevant educational Websites: many sources exist.
- An evaluation scheme to ascertain the quality of available materials or Websites: there are groups that provide objective assessment of available materials.
- Identifying specific sections of Websites and relating them to curricular and instructional needs. Selecting relevant Websites is like building a large reference library that is cumbersome and overwhelming to the user. Experience is proving that students and teachers make better use of the Web if their needs are linked to specific sections.
- Identify priority areas for the development of local content, and suitable national agencies as well as private sector institutions for creating the content.

Performance Measures

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

The Executive Group will publish performance measures for this policy. These measures will address Identification and/or Development of appropriate ICT for Education, Distribution and Delivery of ICT, Maintenance and Support of ICT, ICT Literacy, and ICT Integration. At a minimum, the Executive Committee will publish measurements of:

- Levels of basic ICT Literacy for Secondary School leavers
- Levels of confidence in using ICT amongst teachers and other education staff
- Levels of access to ICT resources by students/learners (broken down by education level)
- Levels of access to ICT resources by teachers (broken down by education level which they teach)
- Usage of ICT to support teaching and learning (broken down by curriculum)
- Availability and usage of electronic teaching support materials to support each curriculum

Additionally the Executive Group should ensure:

- Each educational site is regularly graded to assign an ICT development level (see below) and
- Each service (see below) has defined performance measures in place

National Standards Setting Body

A National Standards Setting Body for ICT will be established. This will represent the wider ICT Community and advise the Namibia Qualifications Authority (NQA) on ICT matters. The NSSB will consist of members drawn from the ICT industry, employers, employees, professional bodies, training providers, government, and lobby groups.

The NSSB will generate both competence and curriculum standards for the industry with a view of approval by the NQA in terms of Act 29 of 1996. Such qualifications will then be registered with the Namibia Qualifications Framework (NQF).

HIV/AIDS

ICT in the classroom offers an opportunity to underpin the national effort to fight HIV and AIDS. While efforts are already ongoing in terms of the development and distribution of ICT materials, a lot still needs to be done. ICT would open new windows of opportunity to both learners/students and teachers/educators to access information. Education has been identified as the most significant vehicle to create an understanding of the disease and to mitigate the affects of the pandemic. Access to relevant and up-to-date information will empower learners and teachers to be able to make informed decisions.

Gender

ICT represents a major opportunity for women. It allows for increased communication and partnership and in many instances provides the opportunities for flexible working practices that help empower women. Development of ICT skills for women presents an opportunity to empower them.

Special Needs

Guidelines and resources to support students/learners and staff with special needs, people challenged with visually- and hearing impairment, and physically challenged will be consistently reviewed and amended as needed. It is recognized that ICT can be an aid to helping people with special needs, and that an understanding of this needs to be part of the teacher education curriculum and budgeting process.

ICT Literacy Qualification

The education ministries and their partners will maintain a basic ICT Literacy (or Literacy) curriculum and standard that may be freely used by organizations in Namibia and beyond. The qualification will cover the basic skills required to operate a PC, search for and retrieve information on the web, prepare a basic document, communicate by e-mail and operate a simple spreadsheet. The aim of this qualification is to provide an entry-level benchmark for all students/learners, and the national workforce to achieve and exceed.

Technical Standards

The policy recognises the need for agreed standards for ICT equipment (hardware and software) used to deliver the policy. The ICT Steering Committee will develop and maintain a list of standards. It is their responsibility to ensure the standards selected allow for reasonable interoperability (open standards), diversity, vendor independence, functionality, and value for the education community. The ICT Steering Committee will recommend changes to the standards, which must be endorsed by the Policy Executive to become official policy.

Specifically the standards policy should include; Hardware Platforms, Operating Systems, Web Browsers, Word processor, Published Document Exchange Format, Spreadsheet, Presentation Software, Database, E-mail clients, Network Infrastructure, Management Systems, Software required for the national curriculum, Audio Visual resources and Archiving.

The policy will focus on standards for the formal education sector (primary education, secondary education and teacher education), and will be able to recognise exceptions where the standards policy need not apply. The standards policy must be widely known within the wider education community, but need not be followed.

All donations and private/civil partnerships will be expected to follow the standards.

Open and Distance Learning

Open and Distance Learning (ODL) refers to more flexible approaches to providing education and training, involving a combination of conventional face-to-face contact and independent study methods, using a variety of media and technology. The use of ICT is, therefore, at the heart of ODL delivery. Publicly funded ODL institutions in the country (NAMCOL, UNAM-CES, Polytechnic-COLL, and NIED-BETD INSET) will continue to develop and implement strategies, both individually and collectively under the auspices of NOLNet, to ensure the use and integration of ICT in Programme development and delivery.

ODL has a wide community including groups like Adult Basic Education students. It is also a fast growing area both in Namibia and worldwide. It is already providing wider access to training, and improved access to international quality training for our citizens. The policy recognises that partnerships making the combined use of Ministry(s) ICT resources and the resources and needs of the ODL community represent good value to the nation and must be supported.

Library, Community, Sport, and Culture

For all citizens to have access to ICT education and achieve life long learning we must ensure the availability of such services both within the formal education community, and beyond into the informal education community. Libraries, archives, museums, and related functions like Community and Resources Centres sit at this junction. They serve both formal and informal education systems and ensure access for all. They represent opportunities for self-education and act as

outposts for distance learning. Such institutions are also major guardians of knowledge for our country and act as portals to their own and others knowledge. This policy recognises the role that libraries and similar community centres have in enabling distance learning, supporting education, and providing access to all sections of society. The policy recommends that such centres should have an Internet enabled ICT facility to support these educational activities.

The policy also recognises that the development of ICT skills and facilities is an important aspect of Arts education, and a provision to produce ICT skilled Arts professionals is required for many areas of the economy e.g. Media and tourism.

Youth Service

The Youth Service will continue to offer ICT awareness and training to young people through the Multi-Purpose Youth Centres located round the country. They will work to enable all young people to have some access to ICT facilities and to obtain basic ICT Literacy.

Higher Education

The higher education establishment is made up of independent bodies empowered to develop their own ICT Policies. They will both be represented within one or more of the Policy groups in order to ensure integration between them and the formal education system that feeds them. In particular, the requirements for their involvement in ICT Literacy standards, development of the ICT workforce, and role in pre and in-service teacher education must be recognised.

Vocational Training

The vocational training community comprises a number of government owned and independent training establishments. All such establishments will be encouraged to incorporate ICT throughout the curriculum and to ensure their trainees/students possess basic ICT literacy skills by the time they graduate. This policy recognises the role private industry has to play in vocational training both for ICT literacy and for the production of ICT professionals. The policy also recognises the need to ensure internationally recognised standards and quality control measures that must be encouraged and used within the vocational training community.

Parents

It is recognized that parents play a vital role in supporting their children's education. An ICT strategy for education must ensure that parents have some understanding of ICT. It is preferable that parents also have some experience of ICT. With these goals in mind, open classes for parent to develop ICT awareness and simple use will be offered. This may be through schools, libraries or community resource centres.

Pre-Primary Education

The policy recognises the benefits of ICT in pre-primary education. This area is the responsibility of the Ministry of Women's Affairs and Child Welfare who will develop policy in this area.

Use of ICT for Education Management

Many of the benefits of using ICT for management and administration will only occur once a significant and critical mass of the education community have access to ICT facilities. In order to ensure easy access to data and efficient training a single standard must be identified and used by all institutions.

The following areas are required:

Communication

The e-mail and digital library services allow much greater communication and sharing of knowledge. Communication costs are also manageable since the network and other infrastructure for communication is a fixed predictable cost, rather than an unpredictable cost that results from phone use and travel costs.

Finance and Human Resources

An integrated finance and HR system allows all stakeholders to see and manipulate their data. It provides real time updates to managers who require summaries of expenditures and need to make decisions on such information. It allows greater control and oversight for audit and efficiency purposes.

Management Information

Information on various parameters like class size, teacher pupil ratios, resource ratios, exam results etc is vital to improve the performance of the educational system. The EMIS must be developed further and other data sources such as census data integrated with it using tools like GIS.

School Management

Schools have various administrative tasks such as scheduling, which ICT can assist in reducing the time spent and/or improve the solution found.

Records Management

The archiving of information and continues availability of the institutional memory is a key factor in keeping government operational. Electronic records management systems can sub-

stantially improve performance, effectiveness and efficiency, but adequate care and advance planning must ensure that information is preserved for the long-term to prevent serious data losses.

Public, Private, and Civil Partnerships

ICT with its networks and multiple partner value chains can never survive in isolation, indeed for it to work it must have linkages and partnerships. To achieve the goals of this policy linkages and partnerships beyond government, to civil society, NGO's, commercial interests and the international community will be essential.

This policy recognises the need for, and desire to develop such partnerships. The policy recommends the proactive use of partnerships to speed up implementation of the policy, to develop the Namibian ICT economy, and to reduce the burden on taxpayers.

Financing

Computers, in particular, need highly skilled and costly maintenance to operate most of the time. Yet, in almost all cases, schools invest in buying and networking computers but do not budget sufficiently for their maintenance and technical support. It is important, therefore, to plan and budget for the total cost of ownership (TCO).

Elements contributing to TCO include:

- Acquisition of hardware and software;
- Installation and configuration;
- Connectivity;
- Maintenance;
- Support, including supplies, utilities, and computer training;
- Retrofitting of physical facilities; and
- Replacement costs (in five to seven years).

It is estimated that the annual costs of maintenance and support for a healthy education computer system can range between 30% and 50% of the initial investment in computer hardware and software³. This makes some donated computers quite expensive, especially when they are old, outdated, and requires a lot of maintenance

The overall aim on funding should be to allocate the necessary funds to enable this initiative to succeed. Specifically, Government should take the necessary steps to encourage other sources of funding and involvement that are consistent with the decentralized initiatives (e.g. including industry sponsorship, local fund-raising initiatives, community activities) to decide how and on what basis supplementary central funding should be made available to support certain initiatives.

A number of the other measures we have discussed will have costs. (E.g. Increased teacher education, the establishment of an external network for teachers, stimulus to software development etc.) We have not produced a detailed report, but we are clear that a Government with a clear commitment to this area could finance them without major reallocation of funds.

Commercial Educational ICT Sector

It is recognised that it would be of national benefit to develop local Educational ICT businesses and solution providers. These can develop local solutions and create local employment rather than spending the educational ICT budgets on foreign solutions and services.

Use of Facilities

During school hours, all use of ICT facilities is to be by learners and students. Outside of school hours, a school may choose to make available their ICT facilities. The decision to do this must be taken by the school and the local community. No extra resources will be provided to a school that does this, but the school may enter into financial arrangements with other organisations and/or individuals to support this work and the school. In particular, activities to provide a service to the community and to help make the ICT facilities sustainable are to be encouraged. Funds arising from financial arrangements are to be used to support the school. The Ministry may only intervene in such schemes where issues of negligence, abuse, and disrepute arise.

Policy Ownership

Overall responsibility for this policy belongs to the Education Executive ICT Committee as defined in this Policy. However, the Ministers of Education must approve changes in the policy before they can be accepted and the policy amended accordingly.

³ Haddad, W. (Ed) (2002) "Technologies for education and learning: More than meets the eye" in TechKnowLogia. January-March 2002. Source http://dolphin.upenn.edu/~tsargent/_private/SOC%20530/techknowlogia2002ed.pdf

Appendix 1: List of contributors

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Appendix 2: ICT in Education Steering Committee TOR

Introduction and Motivation

The following document is the proposed Terms of Reference (TOR) for the ICTs in Education Steering Committee (referred to as the Steering Committee or the Committee through the remainder of the document). It seeks to establish the composition, purpose, governance, and rules of operation for an ICT and Education Steering Committee to provide oversight and guidance to ICT and education activities in Namibia.

The creation of this Steering Committee is an attempt to establish a single forum for discussing, guiding, and promoting coordination and collaboration among all projects, organizations, activities, and initiatives seeking to support the use of ICTs in the basic education sector in Namibia.

Steering Committee Members

This committee's membership shall contain significant representation from the Ministry of Basic Education, Sport, and Culture's (MBESC) Executive Management Team (EMT), representation from regional offices, and representation from the Teacher Resource Centre (TRC) network. Representation from two directorates of the Ministry of Higher Education, Technology, and Employment Creation (MHETEC) are included given their central role in teacher training for the basic education sector, as well as for their portfolios including distance education, technology, and youth programming. In addition, the steering committee includes representatives from ICT and Education projects and organizations.

Ministerial Representation:

1. Director, Educational Planning and Implementation (EPI), MBESC
2. Director, National Institute for Educational Development (NIED), MBESC
3. Director, Planning and Development (PAD), MBESC
4. Director, General Services
5. Representative, Directorate of Higher Education, MHETEC
6. Representative, Directorate of Science, Technology and Research, MHETEC
7. Representative, Regional Education Offices, MBESC
8. Representative, TRC Managers, MBESC
9. Culture and Lifelong Learning (COLL)
10. Vocational Training
11. Youth
12. Public Service Information Management

NGO Representation

13. Executive Director, SchoolNet Namibia
14. Rossing Foundation

Donor Representation

15. Discovery Channel Global Education Fund
16. Education Team Leader, USAID Namibia
17. Chief of Party, American Federation of Teachers (AFT)

18. Chief of Party, Basic Education Support Project (BES)
19. SIDA
20. Chief of Party, Initiative for Namibian Education Technology (iNET)

Educational Institutions

21. UNAM
22. NAMCOL
23. Polytechnic
24. A representative of the Colleges of Education

Volunteer Organization Representation

25. Associate Peace Corps Director (APCD), Peace Corps Namibia
26. Field Director, WorldTeach Namibia
27. IFESH
28. Country Director, VSO
29. NAMAS

This proposed TOR allows Committee membership to change according to the expressed wishes of the Steering Committee. In particular, it is recognized that representation from ICT projects and activities will change as new projects are developed and older projects complete their activities. Similarly, while the Committee expects the organizations listed above to nominate specific people to serve on the Committee, it is understood that these positions are linked to the named individuals remaining in the specific capacities for which they are nominated. Whenever possible, the named representative should attend Committee meetings, but may send a person to act in their place if unable to attend meetings.

In addition to general Steering Committee membership, one member will be selected from the group to serve as the Committee Chair. It will be the responsibility of the Chair to schedule, convene, and chair the Committee. Along with the Committee Chair, a separate member will be selected to serve as Committee Secretary. The Secretary will be responsible for taking official minutes for committee meetings and distributing minutes to committee members *prior to* the next committee meeting. The Chair and the Secretary will be responsible for developing and posting the agenda for upcoming meetings *in time for additions and corrections to be made*.

Executive Committee, Working Groups, and Partners Committees

Executive Committee

The Executive Committee would be a high profile decision-making body to which the Steering Committee shall report. The membership of the Executive Committee will comprise selected heads of key institutions and/or organizations nominated by the Steering Committee. The Minister of Higher Education shall appoint the members of the Executive Committee based on the recommendations made by the Steering Committee.

Only the names of the institutions and/or organizations and not persons are to be named. The proposed institutions and/or organizations will submit the names of their chosen representatives to the Minister. It was also decided that membership will be limited only to key institutions that have direct impact on the education sector, with the provision to co-opt.

Working groups

Working Groups are recognized as parts of the Steering Committee, and are established with the purpose of providing specific guidance to an activity or project. For example, a working group may be established to provide guidance to the iNET activity to connect the colleges of education. While a working group may be given limited authority to make decisions on behalf of the Steering Committee, it is recognized that its power is derived from the Steering Committee and that the working group is ultimately answerable to the Steering Committee. Working group membership is not confined to members of the Steering Committee, even though it is expected that each working group will include at least one Steering Committee member, who will be responsible for reporting working group activities to the larger Steering Committee. Whichever the Executive Committee or the Steering Committee as a whole may establish a working group.

Partner Committees

Unlike working groups, Partners Committees are governed independently of the Steering Committee, but are requested to inform and seek advice from the Steering Committee regarding their project activities. This is specifically the case for projects funded through Global Development Alliance (GDA) funding that are governed via their own alliance steering committees.

Roles of the Steering Committee

The primary role of the Steering Committee is to provide overall vision, planning, coordination, and oversight to all ICT projects and activities supporting basic education within Namibia. Decisions of the Steering Committee, to be valid, must be consistent with the policies of the MBESC, MHETEC, SchoolNet, as well as the donor and volunteer agencies represented on the Steering Committee.

It is proposed that the Steering Committee meet regularly, monthly, bi-monthly, or quarterly as decided by its members. Frequent meetings will be particularly necessary during times of heavy project-based activity requiring timely guidance.

Steering Committee Responsibilities

1. Create, maintain and execute the implementation of the ICT Policy for Education.
2. Provide a point of coordination for activities seeking to support the uses of ICT in the education sector.
3. Provide guidance on project implementation plans and activities.
4. Provide guidance and feedback on proposed revisions to implementation plans as necessary during the life of projects and activities.
5. Provide input regarding the selection of sites served by projects and activities.
6. Monitor and review progress of projects and activities to ensure that they are implemented according to approved implementation plans.
7. If needed, recommend changes in projects and activities.
8. Receive and review project reports.
9. Receive and review project proposals for new ICT and education activities.
10. Facilitate the procurement of technical assistance and commodities.
11. Review policies and recommend changes from time to time as needed.

Notes

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