

**THE GHANA INFORMATION &
COMMUNICATIONS TECHNOLOGY (ICT)
IN EDUCATION POLICY**



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MINISTRY OF EDUCATION & SPORTS

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ACKNOWLEDGEMENTS

The ICT in Education Policy has been the result of an extensive consultative process, in which various sector stakeholders – public, private, civil society and development partners - were represented (*please see Appendices 1 for list of names and agencies*).

It seeks to provide a framework in which information and communication technologies will be used to transform the educational sector, allowing all Ghanaians to pursue quality life long learning opportunities regardless of their geographical location.

The process included the following steps:

- (1) The initial workshop of sector stakeholders convened under the consultative process for *The Ghana ICT for Accelerated Development (ICT4AD) Policy* in 2001
- (2) The development of the *Introduction of Information and Communications Technology in Education: A Policy Framework* (2002) as a part of the initiatives of the Ghana Education Service (GES) to streamline implementation of ICT programmes in pre-tertiary institutions
- (3) The development of the Education Strategic Plan (2003) which addressed policies, targets and strategies including the need for ICT in Education
- (4) The development of the actual draft policy document for the sector including a number of sector stakeholder consultations (January – June 2006)

Additionally, the Ministry of Education, Science and Sports (MoESS) and its primary implementing arm, the Ghana Education Service (GES) have been implementing a number of workshops geared towards identification of key areas as to how ICT in Education could be developed and implemented in a sustainable manner.

The development of this policy represents a critical step in streamlining efforts towards integrating ICTs into the educational sector. Once finalized, the Ministry intends to focus on specific strategies in implementing the policy. This will be further defined in an implementation plan.

FOREWORD BY THE MINISTER OF EDUCATION, SCIENCE & SPORTS

The Government of Ghana is committed to the transformation of the agro-based economy of Ghana into an information rich and knowledge-based economy and society using the tools of Information and Communication Technology (ICT)

The government has acknowledged the need for ICT training and education in the schools, colleges and universities and the improvement of the education system as a whole.

The deployment of ICT into Education will result in the creation of new possibilities for learners and teachers to engage in new ways of information acquisition and analysis. ICT will enhance access to education and improve the quality of education delivery on equitable basis.

The government is therefore committed to a comprehensive programme of rapid deployment and utilization of ICT within the Education Sector to transform the education system and thereby improve the lives of our people.

It is the government's desire that through the deployment of ICT in Education, the culture and practice of traditional memory-based learning will be transformed to education that stimulates thinking and creativity necessary to meet the challenges of the 21st Century.

Given the magnitude of the task ahead of us, the government enjoins both the public and private sector to join hands to ensure that our children receive high quality teaching and learning. I call upon all the stakeholders in the education sector to contribute to the achievement of this vision.

HONOURABLE MINISTER FOR EDUCATION, SCIENCE and SPORTS

ACRONYMS

DDG-MS	Deputy Director-General (Management Services)
DDG-Q&A	Deputy Director-General (Quality & Access)
DFID	Department For International Development
DG	Director-General - (GES)
EdSEP	Education Sector Plan
EFA	Education For All
FCUBE	Free Compulsory Universal Basic Education
GES	Ghana Education Service
GeSCI	Global eSchools & Communities Initiative
GheSCI	Ghana eSchools and Communities Initiative
GLOBE Programme	Global Learning and Observations to Benefit the Environment Programme
GPRS	Ghana Poverty Reduction Strategy
ICT	Information and Communications Technology
ICTs	Information and Communication Technologies
ICT4AD	Information and Communications Technology for Accelerated Development
ICTE	Information and Communications Technology in Education
MoES	Ministry of Education & Sports
NCTE	National Council for Tertiary Education
NFED	Non-Formal Education Division
NGOs	Non-Governmental Organisations
PTA	Parent Teacher Association
R&D	Research & Development
SMMEs	Small, Medium and Micro Enterprises
STC-ICTE	Special Technical Committee on ICT in Education (MoES)
STME	Science Technology and Mathematics

GHANA ICT in Education Policy

	Education
	Technical Vocational Education & Training Division
TVET	(GES)
	United Nations Development
UNDP	Programme
	United States Agency for International
USAID	Development

EXECUTIVE SUMMARY

This policy document seeks to inform sector stakeholders as to why Information and Communication Technologies (ICTs) are an important part of our modern society and the role it plays in the education sector. The policy also seeks to underpin the vision and mission of the Ministry of Education, Science and Sports with a view of identifying how the sector will use ICTs to develop the requisite human resources for the country which will meet the demand of the labour market, locally as well as internationally.

A review of the present challenges within the sector have been undertaken to ensure the definition of appropriate strategies for this policy. Existing policy and strategy documents for the sector have also been reviewed, ensuring attention to equity, access and quality which are key priorities for the sector Ministry. In defining the strategic use of ICTs to achieve developmental objectives for the sector, a number of guiding principles have been adopted. These have been used to reflect national needs and priorities as they relate specifically to the education sector. They are to:

- Promote and expand equitable access to education;
- Promote the development and use of ICTs to enhance teaching and learning and management information;
- Promote ICT initiatives that will transform the culture and practices of traditional memory based learning to education that stimulates thinking and creativity;
- Initiate and promote educational practices that cater for individual differences and learning styles based on equitable access.
- Provide competent ICT literate graduates to meet the demands of the national and international labour markets
- Create smart partnerships for a sustainable ICT programme through collaboration with the public, private and community sectors.

Several sector and national priorities have influenced the Policy, including:

- The Ghana ICT for Accelerated Development (ICT4AD) Policy: within this document, education is recognised as a cross-cutting issue within the national framework crucial to the support of the thirteen other national pillars.
- ICT in Education Policy Framework: which highlights key issues and expected benefits of ICTs in Education (2002)
- Ghana Education Strategic Plan 2003 – 2015: Volumes I and II (2003)
- World Forum Education Dakar (2000)
- White Paper on the Report of the Education Reform Review Committee (2004)
- Report of Educational Reforms in Ghana: Meeting Challenges in the 21st Century

Seven thematic areas, outlining the requisite guiding principles, objectives and strategy have been defined within this policy document. They are:

1. Education Management – Ministry/Agencies and Educational Institutions
2. Capacity Building
3. Infrastructure, E-readiness and Equitable Access
4. Incorporating ICTs into the Curriculum
5. Content Development
6. Technical Support, Maintenance and Sustainability
7. Monitoring and Evaluation

CHAPTER ONE: THE CASE FOR AN ICT IN EDUCATION POLICY

National ICT4AD Policy

The Government of the Republic of Ghana has committed to pursuing an ICT for Accelerated Development (ICT4AD) Policy (2003). This national policy outlines the plans and strategies for the development of Ghana's information society and seeks to provide a framework and plan as to how ICTs can be used to facilitate amongst other objectives the national goal of "transforming *Ghana into an information and knowledge-driven ICT literate nation*". The National Policy outlines fourteen (14) pillars, of which education is highlighted, as both a critical pillar as well as a key socio-economic enabler. ¹ Towards this end, a number of key strategies have been identified. These include

- (i) Promoting the deployment and exploitation of information, knowledge and technology within the economy and society as key drivers for socio-economic development;
- (ii) Modernizing Ghana's educational system using ICTs to improve and expand access to education, training and research resources and facilities, as well as to improve the quality of education and training and make the educational system responsive to the needs and requirements of the economy and society with specific reference to the development of information and knowledge-based economy and society; and
- (iii) Improving the human resource development capacity and the Research and Development (R&D) capacity of Ghana to meet the demands and requirements for developing the nation's information and knowledge-based economy and society.

Evidence from large studies and meta-analysis suggests that use of ICTs, in particular computer technologies, is correlated to positive academic outcomes, including higher test scores, better attitudes towards schools, and better

¹ The Ghana ICT for Accelerated Development (ICT4AD) Policy, 2003

understanding of abstract concepts. A longitudinal study of a state wide experiment with computers in the classroom found that those most in need of help – low-income, low-achieving students, and students with disabilities – made the most gains. In addition to better performance in traditional measures of academic achievements, a secondary benefit of ICTs in education is to familiarize new generations with the technologies that have become integral components of the modern world. [1]

This quote from the book *Technologies for Education* illustrates three key points, or benefits, of ICT for consideration:

- Using ICT can result in improved learning;
- ICT offers the greatest support to learners from disadvantaged backgrounds; and
- ICT impacts the society that the learners are in.

Brief Background on ICTs in Education in Ghana

The efforts to introduce ICTs into the sector by the Ministry (primarily through the GES), its development partners and other private sector agencies cover over ten (10) years. Initiatives have spanned pre-tertiary (both public and private schools) and tertiary. Efforts have largely been geared towards the deployment of ICTs to these facilities via the provision of computers and the establishment of ICT laboratories. Access however is still below the standards and numbers demanded. Though comparatively better, the concerns remain for tertiary level institutions. Additionally, there have been several private sector initiatives to set up Community based ICT centres. These however have been largely confined to urban areas with few available examples of how they have been used to support educational objectives.

In a study carried out to review and assess the ICT in Education Initiatives in Ghana (2005), twenty initiatives were selected and their impact assessed to see what lessons could be learnt. Several positive achievements were noted.

- Initiatives contributed to a wider number of students and teachers acquiring ICT skills and developing strong interests in ICT and Science;

- Schools involved in the initiatives were motivated to expand the project and / or acquire more ICT equipment; a number of private-public partners, including Parent Teachers Associations (PTAs) and civil society collaborated in the efforts;
- Lessons learnt from initiatives provided good examples for other schools to introduce their own ICT programmes;

However, the projects themselves faced a number of challenges. At least half of the initiatives had been launched as pilots with none expanded into national initiatives.

Implementation challenges include:

- Poor selection of schools without the involvement of GES / MoESS resulting in duplication and hence some schools having several parallel initiatives while others (especially those in the remote rural towns) had none
- Lack of policy direction at all levels (schools, districts, national) for the integration of ICT in education;
- Heavy dependency on external funds, with most initiatives stopped after depletion of initial funding
- ‘ Dumping’ of obsolete and inappropriate equipment as ‘ support’ for the initiatives
- Low levels of ownership at the level of the schools, due to external motivations , and low levels of understanding on the part of recipients about the potentials of ICTs in education
- Lack of trained ICT personnel (including teachers) far below the numbers demanded to support the initiatives with most capacity building efforts one-off with no continuous trainings planned for

Additionally, there was the recognition that to ensure success and sustainability, ICT in education projects should be implemented not to increase the number of computers, but should instead be based on supporting discrete educational objectives. The lessons learned from the initiatives further highlighted the need for a coordinated, focused and properly managed approach to the adoption and utilization

of ICTs. Such an approach could further improve the accessibility and delivery of quality education and better maximize the impact of ICTs in Education.

CHAPTER TWO: THE POLICY FRAMEWORK AND PRIORITISATION OF INSTITUTIONS

THE POLICY FRAMEWORK

The policy is based on the premise that there are several key elements that underpin the use of ICTs for: (a) teaching and learning (b) management and administration (c) communication (d) access to information. It is recognised that these elements will be dependent on policy reforms, both within education and within other sectors including Communications, Local Government and Rural Development amongst others.

These five (5) key elements are:

- Equity
- Access to ICT Infrastructure
- Capacity Building, and
- Norms & Standards.

EQUITY

Informed decisions have to be taken about resource allocation(s) with care taken to avoid cases where technology further amplifies existing digital divides. It is for this reason that the principle of equity will inform the selected approaches and strategies. This must address the issues of gender and special needs education.

ACCESS TO INFRASTRUCTURE

The expected impact on end-users (learners, teachers, managers and administrators) will very much depend on affordable and continuous access to hardware, software and connectivity. This in turn will be dependent on the availability of appropriate physical infrastructure including classrooms and power sources (e.g. electricity or solar).

CAPACITY BUILDING

Lessons from ICT in education initiatives globally have proved that ICTs can only be effectively exploited when the intended users are competent to do so. This implies

that the user has the requisite level of skills, knowledge and attitudes for using the technology for the tasks required. Initiatives for professional development (pre-service and in-service), standards and norms of performance for students incorporating project-based and other collaborative approaches that integrates the use of technology into the curricula must be addressed. Set and approved ICT standards for use that are aligned to job market requirements (demands) must be defined.

NORMS AND STANDARDS

Current initiatives and donations of software and hardware have sparked debates on issues of open source, copyright, licensing, refurbishment and inter-operability. Further defining nationally accepted norms and standards for use, content, connectivity, hardware, software, technical support and community engagement also need to be addressed.

PRIORITIZATION OF ICT IN EDUCATION AT THE INSTITUTIONAL LEVEL

The current Structure of Education in Ghana is basically composed of three levels in the formal and the other for non-formal as is relevant to the ICT deployment and exploitation programme. These are listed below

- Basic Education
- Second Cycle
- Tertiary Education
- Non-Formal & Community Education

In line with the White Paper on the Report of the Education Reform Review Committee, the Ghana education system is structured as follows:

CYCLE	LEVEL	INSTITUTIONS	STARTING AGE	YEARS
Tertiary	Tertiary	Universities, Polytechnics Professional Institutes, Colleges of Education		
Second Cycle Education	Senior High School	Grammar/Vocational/ Technical/Agricultural/ Apprenticeship Programme	15	4 yrs
First Cycle Education	Basic Education (Free Education)	Junior High School	12	3yrs
		Primary School	6	6yrs
		Kindergarten	4	2yrs

Source: Government white on report of review of educational reforms (insert date)

The entire programme of integrating ICT into Education is both crucial and needs urgent attention. In terms budgetary constraints and rate of provision of an enabling environment it is important to prioritise the provision of ICT services to the various levels of education. To this end the following priority scale arrangement has been made to show the as shown below is proposed:

PRIORITY SCALE	
1a	MoESS & Agencies
1b	Colleges of Education
1c	Teacher Universities
2a	Teacher Universities with ICT
2b	Other Universities /Polytechnics(Gen)
2b	Other Universities /Polytechnics(ICT)
2b	Secondary School/ Technical Institutions
3	Vocational Institutes
4a	Junior Secondary Schools
4b	Community Information Centres
5a	Primary Schools
5b	Pre-Schools

The prioritisation above is based on the following considerations:

- Urgency in providing the enabling environment,
- Need for building the capacity of the teacher who is a central figure in the entire programme.
- Need to put higher priority on those training to be teachers than others.
- Cost of providing an end to end solution and the availability of some of the needed logistics as against budget constraints ,
- Early provision of facilities to courses that demand ICT facilities more than others
- Need to integrate ICT into education.

CHAPTER THREE: POLICY STATEMENT AND STRATEGIC COMPONENTS

The ICT4AD Education Sector Policy Statement

The Education Sector Policy Statement has been previously defined in the National ICT4AD Policy. As a part of the mission to “transform *the educational system to provide the requisite educational, and training services and environment capable of producing the right types of skills and human resources required for developing and riving Ghana’s information and knowledge based economy and society*” the Government is committed to a comprehensive programme of rapid deployment, utilization and exploitation of ICTs within the educational system from primary school upwards.

Policy efforts will be directed at using ICTs to facilitate education and learning within the educational system and promote e-learning and e-education as well as life long learning within the population at large. As a a part of this policy commitment, the Government shall put in place measures to strengthen science education at all levels as promote technical and vocational training with an emphasis on the use of ICTs to facilitate the training and learning process.

Overall Policy Goal

The overall goal of the ICT in Education Policy is to:

Enable every Ghanaian to be able to use the ICT tools and resources confidently and creatively to develop the skills and knowledge needed to achieve personal goals and be full participants in the global economy by 2015.

Seven (7) thematic areas outlining guiding principles, objectives and associated strategies have been identified to achieve the goal of the ICT in Education Policy.

These thematic areas have been defined as :

- i. Education Management – Ministry / Agencies and Educational Institutions
- ii. Capacity Building
- iii. Infrastructure, E-readiness and Equitable Access
- iv. Incorporating ICT into the curriculum
- v. Content Development
- vi. Technical Support, Maintenance and Sustainability
- vii. Monitoring and Evaluation

Thematic Area 1: Education Management – Ministry, Agencies and Educational Institutions

Guiding Principles

- **The utilization of computerized Management tools can strengthen the institutional capacity of the Ministry of Education, Science and Sports, it’s Agencies and all Educational Institutions**

- **The availability of timely , accurate and reliable data can enhance administrative capacity for informed and effective decision making**

- **Effective use of ICT Tools can enhance management efficiencies**

Objectives	Strategies
1.1 Acquire and implement various easily integrated Information Management Systems	1.1.1 Evaluate various types of Management Information Systems and applications that can be used in education administration 1.1.2 Acquire, develop and implement suitable information systems for use in the Ministry, its agencies and educational institutions 1.2.1 Provide appropriate training to staff and management of MoESS, its agencies and all educational institutions on the use of the newly deployed information systems
1.2 Develop institutional capacity in the use of computer-based management tools to enhance administration and management	1.2.2 Develop institutional capacity in the Ministry and other sector implementation agencies to utilize information management tools and to ensure the implementation and support of ICT programmes in educational institutions 1.2.3 Develop capacity in educational institutions to utilize information management tools and to enhance efficient and cost effective administration 1.2.4 Develop and enforce work-place policies and norms for exploitation of ICT tools for management and administrative functions 1.2.5 Develop and support institutional level technology planning
Formulate acceptable use policies based on security, privacy, intellectual property laws, cultural and moral values	1.2.1 Develop acceptable use policy(ies) for ICT incorporating appropriate sanctions for non-compliance 1.2.2 Create awareness and enforce the acceptable use policy.

Thematic Area 2: Capacity Building

Guiding Principles

- The introduction of ICT in the Education Sector necessitates the training of all persons involved in the educational service delivery (management / staff, teachers including teacher trainees, technicians, etc.) and in essence implies the need for lifelong learning of all stakeholders
- An aggressive well planned program is needed to solve the acute shortage of highly qualified ICT & Computer Science Faculty in the country's tertiary institutions
- A corps of highly trained personnel is required to ensure the sustainability and growth of ICT implementation.
- Continued professional develop is a key element towards supporting teachers who are confident and creative users of ICTs
- Training and ICT skills development of teachers can be used to enhance the teaching and learning of subjects in the curriculum.
- Skills for basic troubleshooting and preventive maintenance of computer equipment must be part of the training of teachers.
- The use of Distance Education and virtual learning systems can reduce the number of teachers leaving the classroom for study leave and also reduce cost

Objectives

Strategies

2.1 Development of ICT Faculty & Enhancement of Practical Training in Tertiary Institutions

- 2.1.1 Aggressively implement a scheme to provide scholarships / study leave for postgraduate studies in ICT (both) local and foreign to arrest the critical shortage of ICT Faculty in tertiary institution
- 2.1.2 Implement a programme to promote research in ICT at the country's universities
- 2.1.3 Pursue a programme to start and implement postgraduate degrees in ICT programme at public universities
- 2.1.4 Facilitate visiting Professor / Faculty Exchange Schemes between Ghana tertiary institutions and foreign universities with world class ICT faculties
- 2.1.5 Establish special rewards/incentives/ salary scheme which will attract and retain ICT faculty
- 2.1.6 Put in place special Distance Learning postgraduate programmes for ICT faculty
- 2.1.7 Upgrade ICT facilities (laboratories, equipment, software digital libraries, communication access etc) to acceptable international standards
- 2.1.8 Provide avenues for industrial attachment as part of the training at the tertiary level.

<p>2.2 Provide appropriate ICT Training to all Teachers</p>	<p>2.2.1 Develop a national coordinated strategy for on-going professional development for in and pre-service teachers with a special focus on pedagogy</p> <p>2.2.2 Promote the use of electronic and distance education and virtual learning systems to complement and supplement face-to-face campus based education and training systems</p> <p>2.2.3 Identify select teacher training colleges to provide ICT in education training (applications plus technology integration skills)</p> <p>2.2.4 Equip and re-tool teacher training colleges and institutions to prepare teachers in the integration of ICT in the curriculum</p> <p>2.2.5 Promote basic training in ICTs skills for teachers in all schools and tertiary institutions</p> <p>2.2.6 Train ICT co-ordinators and laboratory technicians / assistants in all educational institutions</p> <p>2.2.7 Develop and regularly evaluate standards for ICT tools and infrastructure</p> <p>2.2.8 Organise regular in-service training for educational sector personnel on the effective use and management of ICT</p> <p>2.2.9 Use ICT to improve capacity building</p> <p>2.2.10 Improve the quality of the education delivery system through the deployment & exploitation of relevant ICT based tools, systems and procedures</p> <p>2.2.11 Use ICT to transform the teaching and learning systems to meet the challenges of the knowledge economy</p> <p>2.2.12 Equip VOTECH Resource Centres to serve as refurbishment centres for computers used in educational institutions.</p>
<p>2.3 Use Distance learning to offer training to teachers in basic (first cycle) schools who have applied for study</p>	<p>2.3.1 Set up appropriate infrastructure at selected centres to facilitate distance learning for all teachers pursuing further courses</p> <p>2.3.2 Set up appropriate infrastructure at public universities focusing on the training of teachers for 1st cycle schools</p> <p>2.3.3 Set up digital e-Libraries to support Distance Education</p>

Thematic Area 3: INFRASTRUCTURE, E-READINESS AND EQUITABLE ACCESS

Guiding Principles

- **The availability of appropriate infrastructure is key to facilitating the deployment of ICT at each level**
- **ICT equipment should be deployed according to internationally acceptable standards.**
- **Students’ access to up-to-date computer-based tools can facilitate their making significant contributions to the knowledge economy.**
- **Equity of access must be an overriding consideration in any ICT programme being implemented**

Objectives	Strategies
<p>3.1 Facilitate the establishment maintenance and support of the necessary infrastructure and related ICT resources within the education sector</p>	<p>3.1.1 Undertake a comprehensive assessment and analysis of the current ICT situation (e-readiness) of all Educational Institutions to include: assessment of ICT infrastructure requirements (present and future), ICT deployment and usage and staff competencies</p> <p>3.1.2 Undertake a comprehensive assessment of the level of ICT deployment and usage as well as future infrastructure requirements within MoESS and all its agencies</p> <p>3.1.3 Develop a multiphase plan for the deployment of ICT infrastructure and tools to retrofit Educational institutions, MoESS and its agencies</p> <p>3.1.4 Implement the plan for the upgrading and deployment of relevant ICT infrastructure and supporting logistics into Educational Institutions and MoESS</p> <p>3.1.5 Develop, regularly update, monitor and enforce standards and specifications for the acquisition and utilization of ICT infrastructure and related resources</p> <p>3.1.6 Equip and retool Teacher Training Institutions to prepare teachers in the integration of ICT in the curriculum</p> <p>3.1.7 Ensure compliance to minimum specifications of infrastructure</p> <p>3.1.8 Facilitate local access to national and international research findings through e-library, etc.</p>
<p>3.2 Provide appropriate ICT Training to all Teachers</p>	<p>3.2.1 Explore cost effective alternatives for educational institutions without regular electricity supply</p> <p>3.2.2 Ensure that ICT resources in all educational are adequately secured</p> <p>3.2.3 Develop infrastructure to support Distance Education and e-Learning</p>

<p>3.3 Facilitate equitable access to ICT for all students and community</p>	<ul style="list-style-type: none">3.3.1 Establish targets and standards for student and community access to ICT and level of ICT Usage3.3.2 Develop new regulatory framework to address access constraints3.3.3 Enhance existing / establish new ICT centres in all Educational Institutions3.3.4 Facilitate and improve appropriate internet connectivity and access to ICT services, including the internet in all Educational Institutions and agencies within the Ministry.3.3.5 Set up ICT laboratories with adequate hardware, software and tools in all educational institutions3.3.6 Introduce computers into all educational institutions (pre-school to tertiary) as resource for management, teaching and learning3.3.7 Establish an Education Portal / Intranet and website using secure and latest technologies for the dissemination of information3.3.8 Put in place special schemes to enable students, teachers and educational institutions to purchase computers through attractive financial packages3.3.9 Set up community ICT centres to facilitate or promote ICT in life long learning3.3.10 Collaborate with the appropriate sector ministry to ensure the availability of national communication backbone to all rural areas
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Thematic Area 4: INCORPORATING ICT INTO THE CURRICULUM AND ENHANCING ICT TEACHING & LEARNING

Guiding Principles

- Curriculum reform is necessary for ICT to be introduced and utilised effectively in the classroom
- Exploitation of ICT in teaching improves students learning and thus develops skills necessary for the competition in the knowledge economy and information society
- The integration of ICT in the education system can boost the economy of the country because it can enhance productivity

Objectives	Strategies
<p>4.1 Integrate ICTs into the curriculum</p>	<p>4.1.1 Establish national minimum basic ICT skills sets at all levels to ensure that all students are computer literate in appropriate basic ICT skills</p> <p>4.1.2 Examine critically the existing curriculum with the view to including ICTs as an additional teaching and learning tool</p> <p>4.1.3 Develop pedagogies that utilise ICTs to meet the needs, interests and learning styles of individual students including the gifted and those with special needs</p> <p>4.1.4 Establish and document guidelines on how ICT skills can be incorporated at various levels and in various subject areas</p> <p>4.1.5 Prepare teacher orientation package on integration of ICTs in the teaching / learning process to include ideas for all subject areas.</p> <p>4.1.6 Equip and retool Teacher Training institutions to prepare teachers in the integration of ICT in the curriculum</p> <p>4.1.7 Provide access for students and teachers to international knowledge networks and shared educational resources</p> <p>4.1.8 Encourage the sharing of experience (lessons learnt and best practices) in relevant meetings and fora at regional and district levels</p> <p>4.1.9 Conduct evaluation of integration of ICT programmes and its impact on education development on an regular basis</p> <p>4.1.10 Develop an appropriate measurement and evaluation mechanism for all ICT skills set programmes at all levels</p> <p>4.1.11 Identify, harmonise and align all existing or future ICT in education programmes to an approved standard studying guide</p> <p>4.1.12 Introduce ICT as a core / elective subject at the SSS level.</p> <p>4.1.13 Develop a study guide for integration of ICT into the teaching and learning process for ICT courses in JSS / SSS</p>

	<p>schools</p> <p>4.1.14 Integrate ICT into the teaching and learning process from kindergarten to tertiary level</p> <p>4.1.15 Carry out a survey on the status and utilization of ICT in all educational institutions.</p> <p>4.1.16 Set up a research unit for the compilation of digital materials to assist teaching and learning</p>
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Thematic Area 6: TECHNICAL SUPPORT, MAINTENANCE & SUSTAINABILITY

Guiding Principles

- **Management support and commitment are required to guarantee successful implementation and sustainability of the ICT in Education Programme**
- **The provision of technical support and regular maintenance is essential to successful implementation of ICT initiatives**
- **The introduction of ICT based educational programmes will require an increase in funding for the resources necessary to accomplish the goals of these programmes**
- **ICT equipment has a finite life span due to wear and technological obsolescence and need replacement and maintenance plans**
- **As a result of the rapidly evolving nature of the technology, flexible, open and upgradeable architectures are preferable (avoid purchasing special non-standard equipment)**
- **Effective monitoring of ICT inventory and maintenance will assist towards sustainability**
- **Functional, reliable and properly maintained ICT equipment is a significant factor in the sustainability and continuity of ICT programmes**

Objectives	Strategies
6.1 Ensure effective support and maintenance of ICT infrastructure	6.1.1 Train ICT coordinators and laboratory technicians in all educational institutions 6.1.2 Set up Regional Technical Support and Maintenance offices 6.1.3 Put in place the proper mechanism for the maintenance and management of ICT equipment in all educational and training institutions 6.1.4 Undertake regular system audits 6.1.5 Promote the development of Technical Support Services as important auxiliary services for maintenance and support of ICT infrastructure and supporting logistics in every educational institution

Thematic Area 7: MONITORING AND EVALUATION

Guiding Principles

- **It is necessary to perform ongoing assessment and evaluation of the extent and impact of the implementation of the strategies in the ICT plan**
- **Regular review and revision of ICT policy and practice keeps the process more current and in line with both management and technological trends**
- **Continuous Research in ICT related issues is necessary, given the volatile and ever-changing nature of modern technology**

Objective(s)	Strategies
7.1 Institute programmes and procedures to monitor and evaluate the implementation of the various components of the ICT in Education Policy	7.1.1 Monitor and evaluate the use and management of ICT tools, systems and procedures and make recommendations for improvement 7.1.2 Institute an award scheme for efficient utilization and management of ICT infrastructure 7.1.3 Keep abreast with regional and international development in ICTs 7.1.4 Regularly research into the most commonly used and effective ICT tools currently on the market and make recommendations available to users

CHAPTER FOUR: MANAGING THE IMPLEMENTATION OF THE ICT IN EDUCATION STRATEGY

Critical Success Factors

As with all policies, the ICT in Education policy needs to be managed in accordance with a framework that supports effective implementation of the policy. A number of critical success factors have been identified. These include:

- **Political and governmental support at the highest level.**
Commitment and responsibility of the MoESS to collaborate with other key Ministries, Departments and Agencies at all stages of the process from the definition of the vision to the implementation of specific programmes and initiatives is required.
- **Active participation of key stakeholders**
The continued active participation of key stakeholders via stakeholder consultations, representation on the Steering Committee and within working groups in the implementation process will be encouraged. Such interaction will provide reliable for feedback, synergies and better collaboration in implementing the Policy.
- **Teamwork and project-based principle of operational management.**
The day-to-day operations management will be performed on the interdisciplinary teams as the ICT in Education implementation calls for the involvement of formidable expertise potential in the field of information, communication and management technologies, as well as excellent knowledge of processes in educational administration.
- **Continuous coordination and feedback at all stages of implementation.**

The effects of ICT in Education can be seen on a long-term basis, while its implementation requires enormous human and financial resources.

- **Change Management**

Considering the magnitude and diversity of change required to make the ICT in Education implementation a success, supporting effective (and non-threatening) change management processes at all levels will be crucial. This will entail:

- Assessing the change readiness of the Ministry, educational institutions and other stakeholders with the view of selecting the best change configuration
- A clearly defined and comprehensive change vision, with the necessary support structures and capacities to make it operational;
- Building a broader base of understanding about the potential of ICTs to transform the sector, using local and international lessons and good practices
- Building the necessary level of stakeholder commitment through incessant communication and public education
- Further defining leadership roles and responsibilities, and building necessary leadership skills at all levels (national, regional, district, intuitional)
- Focusing not just on knowledge and skills but also attitudinal capacities to develop the right culture with the appropriate mindset, values, and behaviour
- Designing appropriate organizational structures at all levels with appropriate reporting structures and integrating mechanisms, people performance management, and people practices.

Benchmarks and annual targets will be set for the following:

- number of connected schools and their level of e-readiness;
- number of teachers trained at various levels of ICT proficiency;
- type of content available to learners;
- ratio of learners to computers;
- range of technologies used in classrooms; and
- Internet connectivity.

Monitoring and evaluation

Crucial to co-ordination is the development, implementation and monitoring of targets. This will be reflected in national and regional ICT plans. Regular reviews and periodic evaluations will be conducted to inform the implementation process. The direction and focus will benefit from insights gained and lessons learned from the reviews. Evidence of success will be captured against nationally agreed indicators and targets. The data collected will guide decisions and inform continuous improvement of the implementation of the ICT in Education policy.

Planning cycles

The achievement of the ICT in Education policy goal that every learner in general and tertiary education and training bands will be ICT capable by 2015, calls for a long-term strategic direction that will provide a framework for specific priorities and actions to be implemented over a period of time. These targets set out in the implementation strategy serve to guide the initial medium-term process of integrating ICT into e-learning and identify key national goals, initiative and strategic resource allocation. A modest, sustained and systematic growth plan is preferred. During this time, realistic targets should be set and communicated upfront by the MoESS its agencies and educational institutions.

PHASES OF IMPLEMENTATION

PHASE I

- **Enhance a system-wide and institutional readiness to use ICT for teaching, learning and administration**
 - Build a education and training system to support ICT integration in teaching and learning
 - Build teachers' and managers' confidence in the use of ICT
 - Build a framework for competencies for teacher development in the integration of ICT into the curriculum
 - Establish an ICT presence in schools

PHASE II

- **Ensure system wide integration of ICT into teaching and learning**
 - Curriculum research and development division should introduce and curriculum guideline for ICT integration
 - Teachers and managers integrate ICT into management and the curriculum
 - ICT facilities widely present in schools
 - All schools with ICT facilities have a full-time teacher to manage the facility and to champion the use of ICT in the school
- **Encourage communities to support ICT facilities in educational institutions**

PHASE III

- **ICT integrated at all levels of the education system – management, teaching, learning and administration**

- All departments of education use ICT seamlessly in planning, management, communication and monitoring and evaluation.
- All learners and teachers are ICT capable.
- ICT is integrated into teaching and learning in all schools.

INSTITUTIONAL ARRANGEMENTS & COLLABORATIONS

The development and implementation of the ICTE policy requires an institutional arrangement and collaboration structure. Institutional relationships between government, privatized operators, the regulatory agency, educational institutions and other relevant line ministries that may serve as key stakeholders in the implementation agenda need to be established and well maintained. Such an institutional arrangement creates an avenue to provide critical and practical direction in the implementation process. For purposes of coordination, the **Ghana e-Schools and Communities Initiative (GESCI)** of the Ministry would serve as the umbrella initiative to drive all other ICT in Education Initiatives in Ghana.

Role of Partners

Ministry of Education, Science and Sports (MoESS)

The overall responsibility for this policy and its implementation belongs to the MoESS. To maintain institutional arrangements and integrity, the Ministry may assign the implementation of specific strategies to any of its agencies. These agencies and all schools will have to implement and deploy systems in accordance with the stated policy and any related regulations.

National and International Development Partners

The funding of ICT in education initiatives at all levels is the prime responsibility of the Government of Ghana as the major stakeholder in education. The Government will need to provide funds for the acquisition of ICT resources, putting the necessary infrastructure in place (especially in the rural areas), maintenance of the resources, and training the required manpower and other related activities. It is unlikely that the

Government can finance acquisitions solely from its resources and that other sources should be explored. This naturally calls for the collaboration with the National and International Development Partners (Private Organisations, Development Partners, NGOs, the Parent Teacher Associations (PTAs), Old students Associations) in the introduction of ICT into education. The roles of these Partners could be summarized as follows:

National Development Partners

Contributing to the funding for, and purchase of equipment, and also facilitating in the building and refurbishing of ICT Centres. They can also provide incentives for teachers who support ICT in education efforts in the schools

International Development Partners

These partners could provide financial support and technical direction to the programmes and projects which are being developed. Several development partners are already supporting ICT in education initiatives and programmes. These Partners include World Links for Development Programme, GLOBE Programme, DFID, World Bank Institute, GeSCI, UNDP, USAID, SchoolNet, Computer Aid International, etc.

Establishment of a Steering Committee on ICT in Education Policy

It is being recommended that the Ministry of Education and Sports in consultation with directors of the various agencies should establish a steering committee to oversee the successful implementation of the ICT in Education Policy objectives and strategies. This apex national body will essentially provide guidance in the entire process of implementation, monitoring and evaluation of the ICT in Education Policy. It shall basically serve as an advisory body.

The membership of the committee should be made up of all key stakeholders in the education sector.

Composition

Chairman (Elected)

Members:

1. Executive Secretary – NCTE
2. Deputy Director-General (Q&A) – Ghana Education Service (GES)
3. Director – Secondary Education Division (SED)
4. Director – Basic Education
5. Director – Teacher Education Division (TED)
6. Director – Curriculum Research and Development Division (CRDD)
7. Director, National Council on Technical and Vocational Education and Training (TVET)
8. Co-ordinator, ICT in Education Programmes, MoESS
9. Head, Science Education Unit
10. Representative of the Committee of Vice Chancellors
11. Representatives of Heads of Computer Science Department of Universities
12. Representative of Development Partners
13. Representatives from the Computer and IT industry
14. Representatives of Polytechnic Institutions
15. Representatives of Colleges of Education
16. GeSCI Facilitator (Ex-Officio Member)
17. Representatives of Special Technical Committee on ICT in Education (STC-ICTE)
18. Representative of Ministry of Communications

The chairman of the steering committee must be an experienced Manager with basic ICT knowledge and political clout who can get things done.

Terms of Reference (TOR) for Steering Committee on ICT in Education Policy

1. Provide a point of coordination for activities seeking to support the use of ICT in the education sector.
2. Provide guidance on project implementation plans and activities
3. Provide guidance and feedback on proposed revisions to implementation plans as necessary during the life of projects and activities.
4. Monitor and review progress of projects and activities to ensure that they are implemented according to approved implementation plans.
5. If needed, recommend changes in projects and activities
6. Receive and review project reports
7. Review policies and recommend changes from time to time as needed

This committee will not replace the existing eleven-member Special Technical Committee on ICT in Education (STC-ICTE). Three members of STC-ICTE will be members of the Steering Committee on Education ICT Policy.

The Special Technical Committee on ICT in Education shall be strengthened to consist of personnel with appreciable background in ICT, Communications and/or Educational Technology from the sector Ministry, Ministry of Communications, IT industry, University, Pre-tertiary and must be chaired by a notable ICT expert with a rich experience in both theory and practice of ICT and more importantly as it relates to ICT in Education. Other institutional arrangements especially at the pre-tertiary level are carefully documented in the ICT in Education Policy Framework.

The Ministry of Education & Sports will collaborate with all Ministries / Departments and Agencies and other stakeholders to promote the implementation and use ICT in their respective areas of operation.

The Ministry of Education & Sports will remain alert and apprise the Government on the progress and development of the ICT sector both at home and abroad.

The MoESS shall make provision for a division / department that will be strengthened in phases to cope with the present need and future requirements of ICT deployment and exploitation.

Collaboration

Existing and new initiatives must be integrated into the new implementation plan for the deployment of ICT in schools. A mechanism to ensure collaboration with key initiatives such as the following must be in place:

- Global e-Schools and Communities Initiative (GeSCI)
- Microsoft Partners in Learning Programme
- NEPAD e-Schools Initiative
- CISCO Academy
- Oracle Academic Initiative
- Science Technology and Mathematics Education (STME) Clinic
- Science Resource Centres Project
- GLOBE Programme
- Intel Initiatives to support education

Whereas most of the initiatives listed above focussed on specific aspects of the ICT in Education Programme, GeSCI has made a commitment to support the implementation of this policy. The MoESS is ready to work with any organisation willing to collaborate on the policy implementation.

Reviewing the Existing Legal, Regulatory and Administrative Framework To Support Effective Implementation

The implementation of the ICT in education policy will rely heavily on Ghana Government's commitment to recommendations made in the ICT4AD, in particular the deployment and implementation of suitable legal, regulatory and institutional provisions necessary to ensure successful implementation.

Globalisation and the pervasiveness of the Internet have given rise to new types of needs, rights and vulnerabilities. For secure electronic transactions to occur, an

environment of trust must be created and sustained through the legal and regulatory apparatus.

In the interest of national development and in consonance with international law and individual rights, without undue compromises on intellectual property rights, protection needs to be given to learners with reference to accessing information for study purposes.

Towards this end and in ensuring that the ICT in Education Policy can be smoothly implemented a number of challenges have to be tackled. These include:

- i. Inadequate legal framework and related institutional infrastructure, to support ICT development and application.
- ii. Inadequate regulatory capacity, especially in the face of convergence of growing networks and services
- iii. Lack of specific and effective legislative instruments on privacy, security, cyber crimes, ethical and moral conduct, encryption, digital signatures, copyrights, intellectual property rights and fair trade practices
- iv. Need for research in ICT in Education related legal and regulatory issues
- v. Lack of legislation on e-rates (education rates)
- vi. Establish an enabling legal framework, aligned with Ghana's constitutional provisions, legislative and regulatory environment, and consistent with regional and global best practices.