

**MINISTRY OF EDUCATION**



**REPUBLIC OF GHANA**

**ICT IN EDUCATION POLICY**

**(AUGUST 2015)**

## ACKNOWLEDGEMENTS

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

The development and review of this policy represents a critical step in streamlining efforts towards creating the building blocks for integrating ICTs into the educational sector. 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 (GES) to streamline implementation of ICT programmes in pre-tertiary institutions
3. The workshop on the Integration of ICT in Education for Policy Makers (2002)
4. The development of the Education Strategic Plan (2003) which addressed policies, targets and strategies including the need for ICT in Education
5. A survey of the education platform that provided a situational analysis of the sector and presented in the Ghana e-Schools Initiative High Level Business Plan (August 2003)
6. The workshops on series of educational reforms across the whole spectrum of education in 2004 and
7. The development of the actual draft policy document for the sector including a number of sector stakeholder consultations (January – December 2006) and its review since 2009 to August 2015.

## FOREWORD BY THE MINISTER OF EDUCATION

We live in a dynamic global Information Technology (IT) world where the difficulty factor of keeping pace and preparing students to be successful and job ready is becoming more challenging. This is because IT advancement has shown how technology influences human evolution. Who we are is determined and influenced by the tools we invent and use. The emergence of Information and Communications Technologies (ICTs) has been revealed as a potential factor for economic growth and social development. Today, ICT is changing the way people work and transforming education systems.

In about 2003, the Government of Ghana set up for itself the task of improving upon access, equity and quality of Education delivery in Ghana. In pursuit of this, the government put in place an ICT in Education policy framework and implementation strategy, complete with measurable outcomes and time lines.

This policy framework, which is an important step in determining the principles and objectives to be achieved, was prepared through extensive consultations with Education Managers, ICT Experts and other Stakeholders with diverse experiences. In developing this policy framework, the government acknowledges the importance of ICT integration and how this will result in the creation of new opportunities for learners and teachers to engage in new ways of information acquisition and analysis that will help transform the economy of Ghana.

Therefore, this policy document will serve as a platform to launch a systematic ICT in Education delivery to ensure our efforts deliver on the three pillars:

- **ICT as a learning and operating tool**
- **ICT as integrated into the teaching and learning**
- **ICT as a career option for students**

As a result, we're fostering a renewed spirit of commitment, innovation and investing in Science and Technology to bend the curve of development and remain relevant in the global economy. The coming years will represent an important challenge for Ghana on our resolute journey towards the goal of integrating ICT in education delivery. The development and integration of persuasive features in ICT tools used in the classroom to enhance teaching and learning will be vital if we are to succeed in producing more quality products from our schools.

The staff of the Ministry of education and its Agencies will continue to work more closely with our partners in and out of Ghana to ensure our efforts lead to sustainable results.

This is why we have began a critical shift in education delivery at all levels, placing a greater emphasis of public-private partnerships and working with local experts and other stakeholders to improve education delivery in schools, colleges and Universities in Ghana.

The Government of Ghana will continue to develop and deploy the utilization of relevant ICT within the Educational Sector to transform the education system with the view to transform and 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 critical thinking, creativity, collaboration and communication necessary to meet the challenges of the 21<sup>st</sup> century.

Given the magnitude of the task ahead of us, I call upon all of us to maintain our focus and join hands to ensure our children receive high quality teaching and learning.

Finally, I want to extend my sincere appreciation to all who worked so hard to produce this policy document that will help our nation deliver greater results towards our goal of achieving access, equity and quality and at the same time accelerate the growth of our economy.

**Professor Naana Jane Opoku-Agyemang**

**Honourable Minister for Education**

**August 30, 2015**

## ACRONYMS

D-G	Director-General, Ghana Education Service
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 e-Schools and Communities Initiative
GheSCI	Ghana e-Schools and Communities Initiative
GLOBE	Global Learning and Observations to Benefit the Environment Programme
GPRS	Ghana Poverty Reduction Strategy
ICT	Information and Communication Technology
ICT4AD	Information and Communication Technology for Accelerated Development
ICTE	Information and Communication Technology in Education
MOE	Ministry of Education,
NCTE	National Council for Tertiary Education
NFED	Non-Formal Education Division
NGOs	Non-Governmental Organisations
PTA	Parent Teachers Association
R&D	Research and Development
SMMEs	Small, Medium and Micro Enterprises
STC-ICTE	Special Technical Committee on ICT in Education
STME	Science, Technology and Mathematics Education
TVED	Technical Vocational Education and Training Division
UNDP	United Nations Development Programme
USAID	United States Agency for International 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 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.

In 2009, the Honourable Minister for Education promulgated an updated National ICT in Education Policy after a considerable stakeholder engagement. Since then, information and computer technology has seen considerable changes that make it imperative that the policy be reviewed to reflect the state of the times.

This updated policy is therefore designed to serve as the catalyst that would create the platform of change needed to propel the renaissance of the Ghanaian educational sector and bring it to a very modern but evolving sector.

The various stakeholder engagements held during the preparatory stages of its formulation, it was noted that the near logarithmic growth of the ICT environment has posed a major threat to those countries that have not been able to, at least, stay abreast simply because applications, content and hardware have all seen considerable metamorphosis during the same period. For both educational leaders, teachers and learners, a major challenge has thus befallen them, as confusion as to what is right to deploy in our educational institutions in the context of the rapid changes becomes a critical policy question.

In addition, challenges in implementation across the country for a wide number of reasons, have engendered some doubts not only about the sustainability of the national ICT in Education policy as presently formulated, but also applicability, in the contemporary context, of many of the policy drivers that were outlined in the previous framework.

Although the Ministry of Education instituted an ICT in Education Coordination office to oversee the implementation of the Policy, leadership in pursuing the policy agenda was thwarted largely by the unwelcome turnover of key personnel over the past five years where a number of persons have served in the capacity of Director ICT at the Ministry.

This updated document which aims bringing Ghana's ICT in Education Policy to a new state of relevance and currency as well as assure its implementation sustainability recognizes the key issues encountered since year 2009, takes lessons from the successes, challenges and failures of all relevant aspects of the policy as well as considers the rapidly changing ICT landscape globally and offers specific prescriptive

policy directives in a framework that should be seen and accepted as workable and implementable by all stakeholders.

As a matter of importance and to provide the requisite harmonisation and alignment, appropriate references have been made, where necessary, to the context of the National Education Strategic Plan 2011-2015, (Wherever necessary, specific annotations have been made where specific sections of the current policy document are referred to.

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.

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

### 1.0 THE NATIONAL EDUCATION POLICY – SITUATIONAL CONTEXT

Globalization and rapid technological advancement has created a new economy, which is driven by knowledge. In this regard, Information Communications technology (ICT) has become undoubtedly the critical enabler of a knowledge-based economy for many nations. Governments across the globe have recognized the positive impact ICT has on the socio-economic development of its people. Consequently, many governments have started to invest heavily on ICT to develop the nation's human capital thereby making them capable of addressing the demands of the digital and information age.

The Education Act of 1987 and the 1992 Constitution of Ghana mandates government to ensure that all efforts are made to make education gradually universal and the progressively free. The 2007 Education Reforms re-affirms education as a right and all Ghanaians shall benefit from the Free Compulsory Universal Basic Education (FCUBE) as stipulated in the constitution. The reform also emphasized the development of human capital for industrial growth and for ensuring competitiveness in the global economy placing high premium on technical/Vocational education and training and improving quality. To this extent, the Ministry of Education has implemented a number of policy and programme interventions aimed at increasing access and equity and improving the quality of education through:

- a) The provision of tuition-free services (National Education Reform Report 2007)
- b) Increasing the teacher-learner ratios through increasing the teacher population (ESP 2010-2020)
- c) Improving the quality of teaching and delivery by reviewing and upgrading the teacher education institutions to Colleges of Education, and by introducing improved in-service training facilities and programmes as well as university level distance learning programmes to facilitate self-upgrade of teachers to the newly desired certification levels (ESP 2010-2020)
- d) Critically reviewing and upgrading the curriculum and content of the schools' syllabi and their associated pedagogical considerations (ESP 2010-2020)
- e) The introduction of a new schools inspectorate authority to raise the profile of monitoring and evaluation to support delivery of teaching services and also to ensure that the outcomes match the anticipated goals, (Education Reform 2007)
- f) The integration of ICT in education to facilitate effective teaching, learning and management through the provision of computer labs, internet and network connectivity to schools, supply of Laptops to teachers and students and capacity development of teachers. (Education Reform, 2007)
- g) In furtherance of the above, the Ministry of Education also:

- h) Introduced an upgraded or enhanced Capitation Grant system to improve funding for the operation of basic schools
- i) Expanded the free school-uniform service in more low income (rural, peri-urban and urban) communities to encourage school enrolment
- j) Increased the coverage of the Ghana School Feeding Programme which was also started a few years ago to serve at least one-meal-a-day to provide a balanced nutritional and health foundation especially for children in the public basic schools as well also be a catalyst for improving school enrolment
- k) The creation of new specialized agencies such as NIB, NTC, NCCA to improve quality of Education.

The Private Sector in Ghana has also been very active in the educational system and as a partner-in-development invests considerably in ICT in the private schools at all levels. Some private universities currently offer courses using ICT platform. At the private pre-tertiary level, the use of ICT is fully incorporated into the curriculum of a number of well-established schools. Policy direction during the update should also enhance the opportunity for the Private Sector to fully participate with the right incentives. The various religious bodies, which have had a long-standing role in the development of education from basic through tertiary levels, as well as in other social interventions such as health facilities and other community-based activities, should also be given a “front row seat” with the appropriate policy interventions. It is noted that some of the religious bodies have some pseudo-public schools that are fully integrated into the Public School system under the Ghana Education Service.

### **1.1 THE ICT IN EDUCATION POLICY OF 2009 IN PERSPECTIVE**

The current National ICT in Education Policy for Ghana was originally drafted in 2003 and saw two reviews in 2006 and 2008. The Ministry of Education promulgated the revised policy document in 2009 for implementation.

In his foreword to the current ICT in Education Policy in January 2009, the Hon. Minister of Education noted, among other things that;

*“... 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.”*

*and further that:*

*“... 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”*

The Ministry of Education therefore saw ICT as a means, not an end in itself. As such efforts at the deployment, exploitation and development of ICTs to accelerate the socio-economic development of the nation was captured in the Ghana ICT for Accelerated Development (ICT4AD) Policy document (2003), with the main mission to “transform Ghana into an information rich knowledge based and technology driven high income economy and society”. That original purpose remains relevant today because education continues to be seen as a key strategic pillar.

It is worthy of note therefore that the policy goals determined in 2009 could be safely aligned with, and adapted from the tenets of the National ICT4AD Policy document as follows, to include:

- a) Facilitating the deployment, utilisation and exploitation within the educational system to improve on educational access and delivery to support teaching and learning from the primary level upwards
- b) Modernise the educational system to improve the quality of education and training at all levels of the educational system and expanding access to education, training and research resources and facilities.
- c) To orient all levels of the country's educational system to the teaching and learning of science and technology in order to accelerate the acculturation of science and technology in society and produce a critical mass of requites human resources and a well-informed citizenry.
- d) To achieve universal basic education and improve the level of basic and computer literacy in the country.
- e) To ensure a population in which all citizens are at least functionally literate and productive.
- f) To expand and increase access to secondary and tertiary education.
- g) To strengthen science education at all levels and in all aspects of the educational system, especially at the basic and secondary levels.

To place the 2009 policy document in context therefore, it is critical to highlight that at its core, the following seven thematic areas that were defined to outline the requisite guiding principles, objectives and strategy at the time were also identified as being the drivers of the core priorities of the education sector in Ghana:

- Education Management – Ministry/Agencies and Educational Institutions
- Capacity Building
- Infrastructure, E-readiness and Equitable Access
- Incorporating ICTs into the Curriculum

- Content Development
- Technical Support, Maintenance and Sustainability
- Monitoring and Evaluation

The review also critically examined and took into consideration issues of implementation challenges that had bedeviled various ICT in Education initiatives including, but not limited to

- the lack of consultation with the Ministry or GES ( in particular) resulting in many pilots not being able to expand to national roll-out levels
- challenges with an overly high dependency on foreign or external funding which led to early demise of programmes and projects after initial funding had elapsed
- lack of trained or motivated ICT support personnel to support programmes, absence of teachers sufficiently skilled to integrate the ICT into their subjects or projects in a contextually relevant manner that would create lasting interest so desired to attract the learners
- The general absence of rich content that was fit-for-purpose as far as the national school curriculum was concerned and
- Equipment, software and infrastructure challenges exacerbated by a proliferation of “dumped” obsolete and inappropriate computers sometimes to schools and/or communities by donors, civil society groups as well as well-meaning individuals with no provision for after installation support or maintenance

It is thus against this background that this revised policy framework has been designed to facilitate the sustainability, adaptability and continuity of ICT in Education in Ghana into the future through the concrete guidelines, objectives and strategies outlined later on in this document

## CHAPTER TWO

### 2.0 THE CASE FOR AN ICT IN EDUCATION POLICY

#### 2.1 INTRODUCTION

It is acknowledged that for Ghana to make any appreciable progress in its socio-economic development efforts, substantial resources will need to be directed at improving educational delivery. The key role that Information and Communication Technologies (ICTs) can play in widening access to, and improving the quality of education at all levels in Ghana continues to be recognized as a key priority area. Important elements of include literacy education, facilitating education delivery and training at all levels, opening opportunities for content creation and open sharing to expand knowledge resources.

International experience from both developed and developing countries have shown that these technologies have an enormous potential for knowledge dissemination, knowledge acquisition, effective learning and the development of more efficient education services.

This ICT in Education Policy is a guide by which ICTs can be exploited, under the guidance of the Ministry and its sector stakeholders, in an efficient and coordinated effort to support the education sector's own goals and operations, as well as within the framework of the national development agenda.

This document therefore provides policy directions for what needs to be done, as well as the general framework for its implementation.

A number of working definitions as they relate to ICTs have been adapted for this policy document from the UNDP:

- a) ICTs are basically information handling tools – a varied set of goods, applications and services that are used to produce, store, and process, distribute and exchange information. They include 'old' ICTs of radio, television and telephone, and the 'new' ICT of computers, satellite and wireless technology and the Internet with their attendant tools. With appropriate content and applications, these tools are now able to work together, and combine to form a 'networked world' – a massive infrastructure of interconnected telephone services, standardized computing hardware, the Internet, radio and television – which reaches into every corner of the globe”.
- b) Information technology means all equipment, processes, procedures and systems used to provide and support information systems (both computerized and manual) within an organisation and those reaching out to customers and suppliers. The term information and communication technology, ICT, was coined to reflect the seamless convergence of digital processing and telecommunications. ICTs include hardware, processes and systems that are used for storing, managing, communicating and sharing information.

Planning for the effective use of these technologies is crucial if they are to have the positive impact expected. Investing in ICTs is a costly decision for any country, whether developed or developing. For developing countries such as Ghana, investing in ICTs presents the dilemma of spending scarce/valuable resources on ICTs or consequently suffering from widening technological gap. As noted by Swarts (2006) *ICTs can be powerful, essential tools for learning: understanding, interpreting and communicating about the real world OR they can be black holes into which we pour our money, intelligence and time, getting very little in return.*

Effectively used, ICTs can amongst other things:

- a) Provide multiple avenues for professional development of both pre-service and in-service teachers, especially through distance education
- b) Facilitate improved teaching and learning processes
- c) Improve teacher knowledge, skills and attitudes and even inquiry
- d) Improve educational management processes
- e) Improve the consistency and quality of instruction both for formal and non-formal education
- f) Increase opportunities for more student-centered pedagogical approaches
- g) Promote inclusive education by addressing inequalities in gender, language, disability
- h) Widen the traditional sources of information and knowledge
- i) Foster collaboration, creativity, higher order thinking skills
- j) Provide for flexibility of delivery and
- k) Reach student populations outside traditional education systems
- l) Facilitate open content creation& sharing as well as content & curriculum research
- m) Assist in improving education governance
- n) Provide employable skills and career opportunities and
- o) Hasten the pace of development through the application of citizen-centered technology to provide needed societal services

However, effectively integrating ICTs into educational planning and delivery can be a complicated process, leading to further disparities and challenges in the system. These may include lack of focus on educational objectives where ICTs are seen as an end itself, rather than a means (tools) to an end.

Towards this end, the ICT in Education Policy will seek to implement solutions within a coordinated end to end system, looking at the combined inputs of educational objectives, multi-stakeholder partners and funding in planning for the stages of (1) deployment of appropriate platforms (2) content and applications

(3) user training and support (4) maintenance and technical support and (5) management, monitoring and reporting.

## **2.2 THE POLICY CONTEXT**

For many years, the Government of Ghana has been a signatory to, a number of reports, policies and initiatives (international, regional, national and sector) that have a bearing on ICT use within the education sector and have also broadly emphasised the role of education and training in achieving the wider development goals and agenda of the country.

On the national level a number of initiatives have directly highlighted the importance of ICTs in achieving education sector goals. The Government 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. <sup>2</sup>

Towards this end, a number of key strategies have been identified, including: promoting the deployment and exploitation of information, knowledge and technology within the economy and society as key drivers for socio-economic development; 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 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.

### **Ghana Shared Growth Development Agenda (GSGDA)**

In Section 6.4 of the GSGDA document Vol 1 (December 2010), ICTs have been identified as a key driver to Ghana's growth and a number of interventions including investment in ICT infrastructure to support education and other sectors, training of youth as well as other professionals in the Ghanaian workforce, the convergence of ICT into the fibre of provision of government and social services among others have been identified and provided for.

The latest **Education Reform** which was launched in 2007, highlights ICTs as an important cross-cutting issue in the sector, and seeks to address this through several strategies including: equipping all educational institutions with computer equipment and ICT tools in a prioritised manner; implementing ICT programmes at the pre-tertiary level in a phased approach, starting with schools already possessing

adequate laboratories and teachers; gradually expanding to other schools as and when ICT equipment and teachers become available; and adequately resourcing computer science and IT departments in public tertiary institutions to enable them to produce skilled human capital to meet the requirements of the industry. Within these reforms, it is also expected that the introduction of ICT into schools should cover teaching of ICT skills to all students, preparing students for the ICT professions and enhancing teaching and learning through ICTs.

### **2.3 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 centers. These however have been largely confined to urban areas with few available examples of how they have been used to support educational objectives.

- a) Initiatives contributed to a wider number of students and teachers acquiring ICT skills and developing strong interests in ICT and Science
- b) 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
- c) Lessons learnt from initiatives provided good examples for other schools to introduce their own ICT programmes
- d) 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:
- e) Poor selection of schools without the involvement of GES / MOE resulting in duplication and hence some schools having several parallel initiatives while others (especially those in the remote rural towns) had none
- f) Lack of policy direction at all levels (schools, districts, national) for the integration of ICT in education;

- g) Heavy dependency on external funds, with most initiatives stopped after depletion of initial funding
- h) Dumping” of obsolete and inappropriate equipment as „support” for the initiatives
- i) 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
- j) 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 necessarily 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.

## **2.4 VISION, MISSION AND OVERALL POLICY GOALS**

The need for a nationally accepted ICT in Education Policy for Ghana is more urgent than ever before. With the increased thrust of the Government in using ICTs as a tool for economic growth and development, almost daily, new plans and new initiatives are being implemented. However, it is recognised that in the absence of a national policy and sector wide coordination, such initiatives will continue to happen haphazardly, with increased risks of duplication and wasting of scarce resources that do not adequately address the educational objectives and priorities with the sector.

The section dedicated to the Education Sector in the National ICT4AD Policy states that as 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.

Recognising that ICTs must serve, rather than drive the implementation of educational strategies, this policy document seeks to provide a clear purpose and rationale for how ICTs will be effectively integrated into the sector, including identifying opportunities, issues, challenges and strategies that will be employed.

Given this context, the overall **Vision** of the ICT in Education Policy will be to:

**Use appropriate ICTs to support and align the sector Ministry's policies, objectives and strategies, particularly as it relates to equitable access to education, quality of education, educational management, science and technology and labour market needs.**

The **Mission** of this policy will be to:

**Articulate the relevance, responsibility and effectiveness of utilizing Information and Communication Technologies (ICTs) in the education sector, with a view to addressing current sector challenges and equipping Ghanaian learners, students, teachers and communities in meeting the national and global demands of the 21st Century.**

The fundamental objective of the policy will be to ensure that the Ghanaian education sector provides adequate opportunities for Ghanaians to develop the necessary skills, regardless of the levels of education (formal and non-formal), to benefit fully from the Information Society.

Towards this end the overall policy goal will be:

**To enable graduates from Ghanaian educational institutions – formal and non-formal - to confidently and creatively use ICT tools and resources to develop requisite skills and knowledge needed to be active participants in the global knowledge economy at all times.**

## CHAPTER THREE

### 3.0 SOME CORE PRINCIPLES ASSOCIATED WITH THE POLICY

To be able to implement a practical ICT in Education Policy on a sustainable basis, it is important that a number of core principles are also placed into proper context to provide effective guidance for the promulgation of the policy framework and associated directives

### 3.1 THE THREE PILLARS OF ICT IN EDUCATION

ICTs as explained earlier in this document is a multi-faceted disciplinary subject area. The education sector's interface would therefore, of necessity need to be all-encompassing to guarantee that the policy coverage is not only comprehensive but also actually addresses the critical concerns and issues of all players in the education sector – ranging from policy managers, school and institutional administrators, teachers, learners, academic faculties, development partners and for-profit service providers, etc.

Consequently, it is recognised that the policy document must be hinged around three pillars, each of which should receive slightly different policy intervention emphasis and strategy to assure effectiveness, namely:

- a) **ICT as a learning and operating tool**
- b) **ICT as integrated into the teaching and learning**
- c) **ICT as a career option for students**

In all three pillars, provision shall be made for policy interventions to regulate, support or procure services from certified service providers. The emphasis being the recognition and certification of such service providers in so far as they deal with the education sector on a formal basis. It is noted that there could be non-certified but competent service providers, who may not be providing direct services to the formal education system but for which a system of advocacy could be instituted (as the desired intervention) to encourage them develop the requisite service delivery portfolio that may have appropriate relevance to content, pedagogy, best practices and other value-added-services.

The above distinctions are necessary as it makes it easy to extract the requisite policy emphasis applicable to the different nodal points on the education continuum, as further explained below:

- a) **ICT as learning and operating tool:** This would allow for ICT (software applications as well as hardware devices) to be used as tool to help manage educational environments. The implication is that the need to improve ICT literacy among school leaders & administrators, teachers, learners as

well as parents for them to be able to access the relevant ICT infrastructure to get their work done or understand (in the case of parents) what is happening at school is duly recognised and catered for. ICT, properly channeled can and should also be used as a platform to help drive change and foster change management philosophies and practices that would allow real transformation within and around schools for two primary purposes – to ensure that ICT is used effectively in teaching and learning and also to ensure that school learner outputs are realised in the form of excellence in academic results. Indeed, Policy direction shall thus be aimed at ensuring adequate preparation of all affected persons in the area of literacy beyond the level of mere appreciation. The ultimate goal would be to create a learner community who are prepared adequately to enter the world of higher education and of work.

b) **ICT as integrated into the Teaching and Learning of Subjects:** This allows for ICT to be integrated into all subjects within the national curriculum and create the opportunity for teachers and educational policy overseers to make it possible to utilise ICT or applicable educational technology tools in the teaching and learning of all subjects in all spheres of our educational system and by extension, our national life. Policy direction shall thus be focused on adequately preparing teachers (beginning with their formative years in training) through in-service capacity building to develop the right and appropriate skills as well as the flexibility to adapt to changing situations including best practices from other school jurisdictions (in Ghana and internationally). Similarly, policy direction shall be focused on creating the right environment for the learners (students) to be able to appreciate and adapt to the use of the ICT in the teaching of the subjects on their syllabi.

c) **ICT as a career option for students:** This may also be referred to either as “the offshoot pillar” or the “ultimate career aspiration trigger”. This allows for talented and interested students to be tutored to high levels of technical competency as far as ICT is concerned so that they can in turn develop into a “talent pool” or “geek corps” to support the growing ICT workplace as a career option. Policy direction is therefore proposed below to make it possible for high fliers whose interest in ICT can be moulded or developed beyond user-level capacity are mentored or provided the platform to do so. It must be pointed out that a direct benefit of this pillar, if and when well-managed, would be the creation of avenues to promote interest in students gaining more interest in the opportunities available to working successfully in the 21<sup>st</sup> Century work place with ICT focused jobs. The corollary of employers also seeing very qualified youth suitably prepared for the ICT market by the Ghana Education system would be a further boost of appreciation of the ICT in Education policy. By giving students the skills to be successful in a 21<sup>st</sup> century workplace, they will more likely find jobs or start ICT-focused enterprises which can bring long term driven economic growth in Ghana

### **3.2 ICT & COMPUTER SCIENCE IN SCHOOLS**

To facilitate the sustenance of ICT and to create a critical mass of interest in the subject as an important subject in Ghana's education curriculum, the treatment of ICT at all levels of the school system is of prime significance. To this end, the following policy prescription is proposed under this framework

- a) A subject labeled, as Information & Communication Technology (ICT) shall become a basic subject to be taught from basic to senior high schools in the country. The content of this course shall range from basic appreciation and hands-on experience from the primary schools to computer literacy and applications use at the senior high school level.
- b) For those learners desirous of pursuing further studies at the tertiary level or in specialized professional schools, an elective "Computer Science" Course shall be offered at the Senior High Schools
- c) The content of the ICT general courses at all levels and the Computer Science course at the Senior High School shall be determined by the CRDD, in collaboration with the requisite accreditation bodies including the Universities and Polytechnics to ensure acceptability and admission at the requisite times
- d) The reclassification of the ICT & Computer Science as core and elective subjects would also need to be discussed with the West African Examinations Council for a suitable timetable to be planned for the conduct of the first examination within an agreed timeframe
- e) There must be a string teacher development programme instituted to create the mass of professionals to handle the programme. Granted that the ICT field is a high yield field, teacher retention is expected to be a major challenge because of the generic value of such skills and the high level of expected turnover and migration especially into the private sector and industry, unless specific retention incentives are planned and programmed for those teachers who would be recruited or trained to teach the subjects especially at the elective stage.
- f) 100% nationwide rollout of this intervention is not practical even within the medium term, therefore a mechanism for identifying & selecting qualifying schools that offer this programme shall be determined

### **3.3 CROSS-SECTORAL ELEMENTS UNDERPINNING THE POLICY FRAMEWORK**

To be successful, this Policy must be fit-for-purpose with cross-sectoral elements that underpin the use of ICTs being fully catered for because they are also dependent on the nature and direction of the policy reforms. In addition to the education sector, other related sectors including Communications, Local Government and Rural Development are very essential to the implementation of this policy. Four of the key elements identified as crucial to planning for, and implementing ICTs in the Education sector are Equity, Access to ICT Infrastructure. Capacity Building, and Norms & Standards as further explained below:

a) **Equity:** The use of ICTs in education will involve have to involve strategic choices about resource allocation. It is expected that the principle of equity will inform the approaches taken and provide the basis for allocation.

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

b) **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).

c) **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.

d) **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.

These four areas are further detailed in the Implementation Plan, along with the appropriate strategies and activities.

### **3.4 PRIORITISATION & DEPLOYMENT OF ICT IN EDUCATION AT THE INSTITUTIONAL LEVEL**

The entire programme of integrating ICT into Education is a crucial and important endeavour that requires strategically targeted interventions to achieve success. Special and urgent attention also needs to be taken into consideration due to the reality in terms of budgetary constraints and its consequential impact on the rate of provision of, and resultant pace of an effective roll-out of an enabling environment.

In line with the Education Reform (2007), the Ghana education system is presently structured as follows<sup>1</sup>:

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<sup>1</sup>**Source:** Government White on Report of Review of Educational Reforms (2004)

CYCLE	LEVEL	INSTITUTIONS	STARTING AGE	YEARS
Tertiary	Tertiary	Universities, Polytechnics Professional Institutes, Colleges of Education	19+	4 yrs
Second	Senior High School	Grammar/Vocational/ Technical/Agricultural/ Apprenticeship Programme	15	4 yrs
First <sup>2</sup>	Basic Education (Free Education)	Junior High School	12	3yrs
		Primary School	6	6yrs
		Kindergarten	4	2yrs

To match the realities on the ground, the policy prescription is to create a deployment balance across the nation by prioritising the provision of ICT services to the various levels of education (especially in the public school system). Consequently, a priority scale arrangement has been designed to be implemented under this policy:

Despite this need for prioritisation, the policy prescription also recognises that the key issues of sustainability and alignment to the educational objectives will have to be planned before projects and strategies are implemented because they are very crucial to direct funding

The prioritisation is based on the following considerations:

- a) The urgency in providing the enabling environment for efficiently integrating ICTs within the sector generally
- b) The need for building the capacity of teachers who are seen as a central figure in the entire programme
- c) The proximity of educational institutions to the job market and the need to provide a competent labour force
- d) The need to put higher priority on those training to be teachers than others
- e) The cost of providing an end-to-end solution and the availability of some of the needed logistics as against budget constraints.

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<sup>2</sup>It is noted that there are also several pre-school institutions (mostly private) operating within the educational sector that would be broadly impacted by this policy. In addition, licensed private institutions operate schools at all levels in the educational cycle

f) The urgency of ensuring early provision of facilities to courses that demand ICT facilities more than others.

<b>PRIORITISATION OF DEPLOYMENT</b>	
1a	MOE & Agencies
1b	Colleges of Education
1c	Teacher Universities with ICT
2a	Other Universities /Polytechnics (ICT)
2b	Other Universities /Polytechnics (Gen)
2c	Second Cycle Institutions (SHS, Technical Inst. & Vocational Inst.).
3	Junior High School
4	Primary Schools
5	Pre-Schools
6	Community Information Centres(outside the remit of education)

Supporting the capacity of the Ministry of Education and its Agencies to be able to maintain pace with the ICT development is seen as an overarching priority. However, in implementing the priorities, it is expected that it will be handled parallel to the priority scale as set for the institutions. Additionally, learners with special needs will be integrated within all priority areas.

Additionally regardless of the above priority scale, any support arrangements falling within the proposed implementation plan deliverables will need to be accommodated.

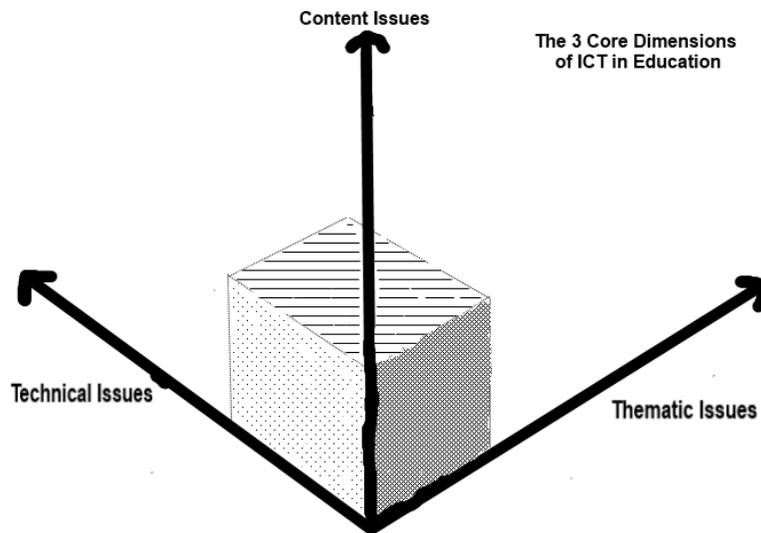
### **3.5 THE STRUCTURAL DIMENSIONS OF ICT IN EDUCATION**

It is also important that all aspects of its structural dimension comprising

- a) Thematic Issues
- b) Content & Curriculum
- c) Technical and Operational

Are considered and given appropriate emphasis for the policy interventions to be effective.

Due to the fact that all of these dimensions have an interlocking relationship with each other that cannot be ignored, it is important to recognize that the source, type and nature of the relationship encountered between the dimensions can result in varying impact, that in turn can also affect the level of success or



failure of (the specific aspects of) the policy, when implemented.

### **3.6 PRIVATE SECTOR BENEFIT FROM THE POLICY**

It is important to stress that whereas the Coverage of this policy is intended to include and apply to both private and public educational institutions it does not anticipate providing opportunity for the providing resource and infrastructural support to private schools.

### **3.7 THE GROWING EVOLUTION OF ICT IN EDUCATION AS EMBEDDED IN OUR LIVES**

“ICT” is so embedded in today’s world such that it is difficult to separate it from any activity at all stages of the educational sector’s spectrum. It is so intertwined with our lives that every facet of it must be fully understood by all stakeholders to ensure that a practical and effective working policy framework is promulgated to serve Ghana’s needs. Consequently, due attention must be given to that fact that in its various mutations, “ICT” comes:

- a) as hardware technology in varying forms – computers, embedded processes in equipment, handheld portables such as smart phones & tablets; etc.,
- b) in the form of software applications from desktop applications to mobile apps to web applications to cloud services, it comes in the form of proprietary applications to open source applications to cloud-based proprietary and open applications and services. Associated with this are the issues of educational content and curricular resources which are also of significance to user experiences with ICT;

- c) in the form of member-driven or externally-moderated social media and networks of varying levels of pedigree and access including open or closed groups, information and data sharing systems, and
- d) in the form of paid commercial platforms where specific goods, services & information resources can be bought, traded or exchanged on a one-time or recurrent use basis

The one underlying common thread among all these mutations is the fact that there also exists with respect to ICT the notion of elapsed-time-sensitivity to decisions and programmes which is the resultant subject of rapid advancement and change and the consequential obsolescence effect that is inevitable in such situations. Policy intervention cannot therefore be undertaken in a static, bureaucratic manner but in a continually evolving way that meets the aspirations of the very nature of ICT and the knowledge economy

### **3.8 ICT OBSCOLENCE**

The operating context of ICT in Education cannot be handled like the other subject segments of the sector in view of the time validity of systems and services underlying ICTs. This impacts both hardware and software components and their associated infrastructure and assets including teachers' knowledge.

For example, the life cycle of hardware technology in particular could be as short as six months, when a specific product is practically pulled off the shelves either for its market unattractiveness or design defects discovered after the product has been launched on the market or it is simply overshadowed by a competing brand of similar vintage. In contrast, a product could also have very long and successful run with all the appropriate after-sales support and warranty facilities available.

To provide effective Policy direction to address this specific issue of elapsed-time-sensitivity, it is essential that the Ministry and the managers of the ICT In Education Policy institute reliable market intelligence before a choice of any segment - hardware, software or any product offering - in the ICT space is decided upon or procured for implementation. In fact, it is imperative (*to ensure*) that the ICT policy does not focus on specific restrictive prescriptions (determined choice) for Hardware (and to some extent, Software) but rather on Teaching and Learning on sustained growth and developmental path, knowing that a long-term lock into a hardware technology may not be beneficial or practical to meet our national aspirations.

To complement the above recommended position on hardware and software, policy direction should also ensure that there exists appropriate and well thought-out complementary procurement strategies that would not only countermand the creation of a huge burden of inability to use because of a bad prior decision (that prevents utilisation of previously procured goods & services for example) but which also does not then prevent the implementation start-up or continuation of an otherwise great ICT programme.

### **3.9 ATTITUDINAL CHANGE IN/OF OFFICIALS RESPONSIBLE FOR ICT**

To give meaning and effect to the stated desire of the Ministry and the GES to ensure that Ghana becomes a solid member of the community of nations that have embraced ICT as an integral resource in its educational system, the Ministry shall invest in effort to ensure that attitudinal deficiencies and non-progressive handling of the ICT phenomenon by persons in authority who (in reality) have no understanding of the subject is fully discouraged.

School Leaders, Teachers, Learners and Parents alike must be groomed to appreciate the contemporary surge in ICT usage and applications and appropriately groomed to harness the power of ICT for the better and positive advancement of education in Ghana rather than put impediments via uninformed or ill-thought out regulations.

We cannot be a country that claims or intends to compete on an equal footing with others (even if it is with a small measure of handicap) if our response strategies to ICT issues end up ultimately creating chasms in knowledge to the detriment of our country.

This means that the Ministry and the GES should critically review, and firmly resolve the treatment of the issue of student usage of personal mobile phones and other handheld devices, especially in senior high schools in Ghana. The need to improve advocacy and redirecting the learning channels for our youth is of significance if our youth are to grow to compete on the global market. As an example of this, a visit to any regional or international educational fair or competition would demonstrate the significance of harnessing talent, knowledge and technology with every opportunity we can get with the very tools that are subjects of discipline and banishment in Ghana. Policy direction shall therefore seek to foster an inclusive proactive stance and convert the issue from being a problem to becoming an advantageous one for the nation.

### **3.10 INTER-AGENCY RIVALRY**

In Ghana, there are several public sector agencies involved in varying segments of ICT space – from the regulatory systems, to technical and operational departments charged with specific mandates, funding support, infrastructure development support, ICT training & capacity building services in addition to development partners and other private (local and international) organisations.

The ICT in Education Policy cannot therefore be run effectively without the active participation of a number of other Ministries, Departments and Agencies. The relationships between the Ministry (and its agencies) and these other MDAs may also be a source or create situations of risk to the smooth running of the policy. In addition, ICT as a subject is still on the frontiers of institutional excitement for many reasons – it is seen as a “fashionable” “high-flying area” and is therefore perceived as being more likely

to get budgetary and logistical support to develop. In reality however, this perception may not be accurate as the national budgetary priorities may differ from that of the Education Ministry or even within the Ministry itself<sup>3</sup>.

To ensure its success therefore, it is recognised that a certain element of inter and/or intra-agency rivalry may exist that, for example, could pose certain levels of implementation challenges if not handled with tact and non-confrontationally<sup>4</sup>.

Whilst the presence and operation of all of these institutions and/or departments may help to cluster the operating space and create the potential for escalated growth, the biggest issue that policy direction should be pointed to is whether all these energies are properly harnessed and channeled to create a purposeful ICT in Education operating paradigm for Ghana.

The policy direction is therefore necessary to facilitate working to create a consolidated buy-in from all these agencies to avoid conflict, cross-purpose actions and set the tone for understanding the strengths and weakness of all these players given that many of them are not directly part of the Education sector.

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<sup>3</sup>It is important to note that the education sector may be an important subject area but not a priority for some of these institutions, which means that policy direction must also be given to creating a strong internal advocacy platform to raise the profile of the needs of the ICT in Education programme.

<sup>4</sup> The subject of the risk and its impact is therefore also considered and treated in greater detail in a subsequent section of this document

## CHAPTER FOUR:

### 4.0 POLICY STATEMENT AND ITS STRATEGIC COMPONENTS

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

#### **Overarching Goal**

*“To enable all Ghanaians including teachers and learners in either in the formal, informal and non-formal systems to use ICT tools and resources to develop requisite skills and knowledge needed to be active participants in the global knowledge economy at all times”.*

Consequently, for each of the identified Seven (7) thematic areas, relevant guiding principles, objectives and associated strategies have been determined to facilitate the achievement of the stated goal of the ICT in Education Policy. For clarity purposes, the thematic areas are as follows:

- a) Education Management – Ministry / Agencies and Educational Institutions
- b) Capacity Building with emphasis on Teacher development.
- c) Infrastructure, E-readiness and Equitable Access
- d) Incorporating ICT into the curriculum
- e) Content Development
- f) Technical Support, Maintenance, Funding and Sustainability
- g) Monitoring and Evaluation

A more detailed discussion is presented below on how each of these thematic areas are to be treated under the policy. The inter-relationship with, and alignment to the National Education Strategic Plan 2010-2020 is also highlighted.

## Guiding Principles

THEMATIC AREA	STRATEGIES	INDICATIVE ACTIVITIES
<b>Education Management</b>	Ensure an Educational Management system that recognizes the relevance of ICTs in Education	<ul style="list-style-type: none"> <li>• Re-orient Educational leadership on the new paradigm &amp; on change management.</li> <li>• Develop and enforce work-place policies and norms for exploitation of ICT tools for management and administrative functions, support institutional level technology planning</li> <li>• Develop appropriate education management support structures and policies for ICT deployment</li> <li>• Create appropriate nationwide organizational structures for ICT development.</li> <li>• Establish special incentives scheme, which will attract and retain ICT teachers.</li> </ul>
	Development of institutional capacity in the use of computer-based management tools to enhance administration and management Objectives	<ul style="list-style-type: none"> <li>• Evaluate various types of Management Information Systems and applications that can be used in education administration.</li> <li>• Acquire, develop and implement suitable (preferably indigenous) information systems for use in the Ministry, its agencies and educational institutions</li> <li>• Provide appropriate training to staff and management of MoE, its Agencies and all educational institutions on the use of the newly developed information systems.</li> </ul>

THEMATIC AREA	STRATEGIES	INDICATIVE ACTIVITIES
		<ul style="list-style-type: none"> <li>• 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</li> <li>• Develop capacity in educational institutions to utilize information management tools and to enhance efficient and cost effective administration</li> </ul>
<b>CAPACITY BUILDING- WITH EMPHASIS ON TEACHER DEVELOPMENT</b>	Development of ICT Human Resources & Enhancement of practical training in tertiary institutions	<ul style="list-style-type: none"> <li>• Implement a programme to promote research in Computer Science &amp; ICT at the country’s tertiary institutions.</li> <li>• Institutionalise programmes in postgraduate degrees in Computer Science &amp; ICT programme at all public Tertiary institutions.</li> <li>• Support private tertiary institutions which have the capacity to offer postgraduate programmes at the tertiary level</li> <li>• Improve capacity development for subject-based Teaching and learning using ICT.</li> <li>• Facilitate Visiting / Faculty Exchange Schemes between and among Ghana tertiary institutions and foreign universities with world class ICT faculties.</li> <li>• Provide access for students and teachers to international knowledge networks and shared educational resources</li> </ul>

THEMATIC AREA	STRATEGIES	INDICATIVE ACTIVITIES
		<ul style="list-style-type: none"> <li>• Establish a network for sharing of experiences and best practices to encourage the sharing of experience (lessons learnt) in relevant meetings and fora at regional and district levels</li> </ul>
	<p>Work towards an Educational system that will span the full spectrum from contact Education to virtual/online Education that is also duly accredited.</p>	<ul style="list-style-type: none"> <li>• Develop and secure program and curriculum accreditation for virtual/online learning.</li> </ul>
	<p>Use distance learning methodologies to offer ICT training to teachers in basic school</p>	<ul style="list-style-type: none"> <li>• Upgrade ICT facilities (laboratories, equipment, software, digital libraries, communication access etc.) to acceptable international standards</li> <li>• Provide avenues for industrial attachment as part of the training at the tertiary level.</li> <li>• Develop a national coordinated strategy for on-going professional development for in-service and pre-service teachers with a special focus on pedagogy.</li> <li>• Promote the use of electronic and distance education and virtual learning</li> </ul>

THEMATIC AREA	STRATEGIES	INDICATIVE ACTIVITIES
		<p>systems to complement and supplement face-to-face campus based education and training systems.</p> <ul style="list-style-type: none"> <li>• Equip and re-tool teacher training colleges and institutions to prepare teachers in the integration of ICT in the curriculum.</li> <li>• Promote basic training in ICTs skills for teachers in all schools and tertiary institutions.</li> </ul>
<b>INFRASTRUCTURE, E-READINESS AND EQUITABLE ACCESS</b>	<p>Ensure the acquisition, maintenance and support of appropriate ICT infrastructure and resources for all levels of the education sector</p>	<ul style="list-style-type: none"> <li>• 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.</li> <li>• Undertake a comprehensive assessment of the level of ICT deployment and usage as well as future infrastructure requirements within MOE and its Agencies.</li> <li>• Develop a multiphase plan for the deployment of ICT infrastructure and tools to retrofit Educational institutions, MoE and Its Agencies.</li> <li>• Implement the plan for the upgrading and deployment of relevant ICT infrastructure and supporting logistics into Educational Institutions and MOE and all its agencies.</li> <li>• Develop, regularly update, monitor and enforce compliance to minimum specifications for the acquisition and utilization of ICT infrastructure and related resources.</li> <li>• Equip and retool Teacher Training Institutions to prepare teachers in the</li> </ul>

THEMATIC AREA	STRATEGIES	INDICATIVE ACTIVITIES
		<p>integration of ICT in the curriculum.</p> <ul style="list-style-type: none"> <li>• Facilitate local access to national and international research findings through e-library, etc.</li> <li>• Explore cost effective alternatives for educational institutions without regular electricity supply.</li> <li>• Ensure that ICT resources in all educational institutions are adequately secured</li> <li>• Develop infrastructure to support Distance Education and e-Learning</li> </ul>
<p><b>INCORPORATING ICT INTO THE CURRICULUM</b></p>	<p>Integrate ICTs into the curriculum for all subjects and at all levels</p>	<ul style="list-style-type: none"> <li>• Examine critically the existing curriculum with the view to including ICTs as an additional teaching and learning tool.</li> <li>• Develop pedagogies that utilise ICTs to meet the needs, interests and learning styles of individual students including the gifted and those with special needs</li> <li>• Establish and document guidelines on how ICT skills can be incorporated at various levels and in various subject areas.</li> <li>• Prepare teacher orientation package on integration of ICTs in the teaching/learning process to include ideas for all subject areas</li> <li>• Provide access for students and teachers to international knowledge networks and shared educational resources</li> <li>• Establish a network for sharing of experiences and best practices to</li> </ul>

THEMATIC AREA	STRATEGIES	INDICATIVE ACTIVITIES
		<p>encourage the sharing of experience (lessons learnt) in relevant meetings and fora at regional and district levels</p> <ul style="list-style-type: none"> <li>• Develop guidelines (standards and benchmarks) for integration of ICT in the teaching and learning of ICT</li> <li>• Integrate ICT into the teaching and learning process from kindergarten to tertiary level.</li> <li>• Carry out an initial survey on the status and utilization of ICT in all educational institutions.</li> <li>• Strengthen the research unit for the compilation and evaluation of digital content for the teaching and learning at all levels of education</li> </ul>
	<p>Introduce ICT and /or Computer Science as a subject at all levels of education</p>	<ul style="list-style-type: none"> <li>• Introduce ICT as a core / elective subject at the institutions</li> <li>• Establish national minimum basic ICT skills sets at all levels to ensure that all students are computer literate in appropriate basic ICT skills</li> <li>• Develop an appropriate measurement and evaluation mechanism for all ICT skills set programmes at all levels.</li> <li>• Develop a teaching syllabus for ICT courses at all levels</li> <li>• Set up a research unit for the compilation and evaluation of digital content for teaching and learning at all levels of education</li> </ul>
	<p>Develop and integrate modern assessment methodology for teaching and learning</p>	<ul style="list-style-type: none"> <li>• Determine and implement authentic assessment (rubrics, project based, portfolios and case study) for students</li> <li>• Establish appropriate teacher performance appraisal system.</li> </ul>

THEMATIC AREA	STRATEGIES	INDICATIVE ACTIVITIES
<b>CONTENT DEVELOPMENT</b>	Development of appropriate content for open, distance and e-learning.	<ul style="list-style-type: none"> <li>• Develop and digitized content to supplement education delivery.</li> <li>• Organize cost effective distance education programmes to cover all levels of education in the formal and informal sectors</li> <li>• Develop for implementation and utilization a national educational portal /website which will provide links to help teachers, students and the public access educational information readily</li> <li>• Modify and convert traditional materials into electronic format for e-learning.</li> <li>• Develop and Promote the use of e-libraries taking into consideration matters of intellectual property</li> <li>• Develop and distribute knowledge resources (e.g. DVD / CD ROMs) to schools to supplement educational delivery.</li> <li>• Strengthen the research unit for the compilation and evaluation of digital content for the teaching and learning at all levels of education</li> </ul>
<b>TECHNICAL SUPPORT, MAINTENANCE, FUNDING &amp;</b>	Promote the development of Technical Support Services as important auxiliary services for maintenance and support of ICT	<ul style="list-style-type: none"> <li>• Recruit, train and retain ICT Coordinators and lab technicians in all educational institutions to provide technical support and maintenance.</li> <li>• Set up Regional and district Technical Support and Maintenance centres.</li> <li>• Put in place the proper mechanism for the maintenance and management</li> </ul>

<b>THEMATIC AREA</b>	<b>STRATEGIES</b>	<b>INDICATIVE ACTIVITIES</b>
<b>SUSTAINABILITY</b>	infrastructure and supporting logistics in every educational institution	<p>of ICT equipment in all educational and training institutions.</p> <ul style="list-style-type: none"> <li>• Develop and implement a sustained process for decommissioning and disposal of obsolete ICT equipment and materials, in line with current legislation.</li> <li>• Undertake regular system audits</li> <li>• Set up an account for all funds received for ICT programmes.</li> </ul>
	Ensure and guarantee sustainability of ICT initiatives	<ul style="list-style-type: none"> <li>• Promote partnership to continuously support and sustain ICT initiatives.</li> <li>• Put in place mechanisms for stakeholders commitments (MOU, Service level Agreement, contract, etc.</li> <li>• Ensure the effective co-ordination and rationalization of funding and funding opportunities by public and private sources to facilitate currency of technology and skills.</li> <li>• Provide a secure, adequate and regular budget line to ensure sustainability of ICT initiative.</li> <li>• Involve stakeholders participation in the ownership of ICT initiatives including PPPs</li> <li>• Encourage appropriate cost sharing strategies to support ICT deployment.</li> </ul>
<b>MONITORING AND EVALUATION</b>	Institute programmes and procedures to monitor and evaluate the implementation of the various components of the ICT education policy.	<ul style="list-style-type: none"> <li>• Monitor the use and management of ICT tools, systems and procedures and make recommendations for improvement.</li> <li>• Continuously evaluate the use and management of ICT tools, systems and procedures and make appropriate recommendations.</li> <li>• Institute a motivational award scheme for efficient utilization,</li> </ul>

THEMATIC AREA	STRATEGIES	INDICATIVE ACTIVITIES
		<p>management and develop innovational ICT infrastructure and content.</p> <ul style="list-style-type: none"> <li>• Develop a standard guide to harmonize existing and future practices for ICT in education programmes at all levels.</li> <li>• Undertake continuous impact assessment on ICT in Education teaching and learning.</li> <li>• Expand and Strengthen EMIS in the collection and evaluation of data on ICT resources.</li> <li>• Expand M &amp; E indicators to include issues related to ICTs</li> </ul>

## CHAPTER FIVE

### 5.0 MANAGING THE IMPLEMENTATION OF THE ICT IN EDUCATION STRATEGY

#### 5.1 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:

**a) Leadership, political and governmental commitment and support at the highest levels.**

Commitment and responsibility of the MOE to collaborate with other key Ministries, Departments and Agencies as well as the District Assemblies and the Parliamentary sub-committees on education and communication at all stages of the process from the definition of the vision to the implementation of specific programmes and initiatives is required.

(1) Ensure that *Policy & Oversight Framework* for Governance (including an effective steering committee made up of carefully selected individuals with operational clout, implementation acumen and zeal and a burning desire to succeed) is put in place with the requisite urgency with a national Steering Committee on ICT in Education Policy Committee<sup>5</sup> pruned down to a functional Committee comprising about five (5) but no more than nine (9) persons hand-picked to reflect the blend of all the stakeholder interests anticipated in the original Steering Committee. The individuals should be picked for their experience in governance, for their ability to influence decisions in/of the wider educational system, and for their demonstrated passion and track record of understanding to see ICT in Education succeed. Their leadership can then be brought on bringing together all the key stakeholders (as we see the list in the original policy document to be).

**b) Funding**

Funding an effective utilisation of resources should be seen as a critical elements and the Government should be committed to providing and releasing adequate resources to ensure success and sustainability. Planning and budgeting for the deployment of ICTs will use a Total Cost of Ownership (TCO) Approach that will include elements relating to:

- a. Acquisition of appropriate hardware and software
- b. Installation and configuration
- c. Connectivity

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<sup>5</sup> See governance structure on Page 36 of the 2009 ICT in Education Policy

- d. Maintenance and technical support
- e. Capacity building
- f. Upgrading/retrofitting physical facilities and
- g. Replacement costs.

Ensure an effective well thought through *Sustainability & Funding Framework* is integrated into the very fabric of the policy. This should be treated as a governance issue and one of the core mandates of the Steering Committee (rather than as an operational/financial issue or imperative). For example, one key sustainability issue, as discussed earlier, may simply be the lack of understanding of core drivers of ICT that could spell doom to the success of implementation of the policy. Many a time, many policy and programme managers equate, albeit wrongly, sustainability to availability or otherwise to funding. Other issues that should also engage the attention of the Ministry, the GES and the Steering Committee include the appropriate choice of technology, appropriate supporting infrastructure and continued availability of resources such as communications, adequate budgetary allocation and donor support, where applicable, to support continuous implementation, available human resource capacity to keep programmes going, etc. This should be one of the core mandates of the Steering/Advisory Committee

**c) Active Participation by 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 feedback, synergies and better collaboration in implementing the Policy.

**d) 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.

**e) 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. Benchmarks and annual targets will be set within the defined Implementation Plan, along with clearly defined targets for delivery.

Given the peculiarities of the Government Machinery, serious attention will be given to the identification of, and target resolution of *Programme Risks*. For example, ICT requires regular investments in procurement and logistics. In the context where the funding releases from the Education Budget may be

erratic and thus prevent timely funding availability to pursue aspects of the programme, there will be consequential risks<sup>6</sup> that would need to be managed. This could for example require new paradigms in forward planning of needs and requirements for programmes. There must be some sort of pseudo-insulation of the ICT in Education Policy especially in the governance, which must be managed properly. The risk of changes (mainly political) in the governance of the sector may derail the advancement of progress of implementation due to changed focus or interest of incoming Administrations, even though there may not be a structural reform programme-taking place.

Several other areas of emphasis would need to be considered in the review of the policy to ensure that sustainability and business continuity principles are assured during implementation. Quite often, very little attention is paid to understanding or reflecting on why policies and systems fail so that the requisite remedial actions are taken on a timely basis. Consequently, despite the best intentions of a policy's promoters, a premature end may be experienced with the attendant potential effect of causing a waste of resources.

To this end, policy direction is required to turn attention to the following indicative areas:

- a) **Risk** – Every policy initiative would face risks that could be detrimental to its successful implementation. The following risks are therefore mentioned for special attention:
- i. **Scalability** - many of the programmes started are not properly piloted and therefore not able to reach the critical mass needed to scale on a wider basis. This means that a proper and effective framework for developing pilots must be developed. It is also recognised that the failure of a pilot may not be a bad thing as the post-failure review may also give a better opportunity to reshape a programme to future success;
  - ii. **Sustainability** – many programmes are not sustainable beyond the pilot phase because, among other things, no funding budgets are put in place to support them, the wrong choice of incubation location, implementing agency, management team or structures -are made. In certain cases, the programme is perceived after take-off as having or being a poor fit into the agenda of the sector. In some cases, for a variety of reasons, the original sponsors also abandon the programmes and the beneficiary institution does not (or is unable to) put in place the mechanisms to continue.
  - iii. **Infrastructural Deficiencies & Security** - is also a potential source of risk for the ICT in Education. As highlighted earlier, many of the classroom blocks put up do not have the requisite security prevention (burglar proofing, lighting etc.) or electrical power infrastructure to support school labs for full time ICT in Education programmes especially. This poses limitation in the scope and coverage of such programmes and the eventual rollout of programme.

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<sup>6</sup> Further discussions of risks in detail are provided later in this review document.

A few weeks ago, the MoE/GES announced the phasing out of blackboards with whiteboards and marker, as well as projectors for teacher presentations. The challenge of sustainability is simply the sustainability of the availability of markers for teachers to use in all parts of the country. Accompanying this would be the appropriate orientation on effective use of these markers to provide some element of longevity of use. In addition, with erratic power supply in certain parts of the country, having projectors in the classroom without adequate complementing backup infrastructure may also create problems of sustainability.

iv. ***Political Acceptability and Tenure Constraints*** – Changes in tenure of (political or technical) leadership has in many cases led to complete reversals or de-emphasis of public policy initiative and their associated programmes. It is therefore strongly recommended that the policy framework is developed devoid of any political connotations and set in place against the background of being an avoidable necessity of Ghana’s educational system. This way support for it, including even the choice of the governance team members would follow the principles espoused above.

b) **Effective Requirements Analysis & Pre-Implementation Issues:** This policy would only be successful if at all stages of implementation, proper requirements analysis carried out to ensure that all the core elements needed to implement any segment of the policy is in place.

i. ***Effective Requirements Planning Imperative:*** This includes making sure that a roll-out framework, a pilot strategy, an operating plan with responsibilities and also a mechanism for managing any transition issues are all in place. Taking note that ICT is also a “fast environment matter”, careful note should be taken to avoid any bureaucratic tendencies.

ii. There is also the need to ensure, as part of the requirements planning stages that designated spending officers would be well resourced to be able to perform their obligations under the affected programmes.

iii. ***Lock-down of variables:*** In an environment of changing variables, it is difficult to pin down a decision without taking firm positions on assumption and other factors before decisions are taken. Consequently, when delays in completing action could lead to undesirable effects, incomplete results as well as stall implementation altogether. It is therefore important that a guideline is developed by the governing body of the policy to provide, on a regular basis, a periodic guideline of all relevant variables so that these can be locked down and made possible for tracking, etc. For example, a vintage set of specifications for equipment and software may be agreed that would guide procurement, donations and maintenance activities. This has the advantage of also allowing for a comprehensive replacement mechanism to be put in place.

### c) Change Management

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

- i. 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
- ii. Building a broader base of understanding about the potential of ICTs to
- iii. Transform the sector, using local and international lessons and good practices; - Building the necessary level of stakeholder commitment through incessant Communication and public education
- iv. Further defining leadership roles and responsibilities, and building necessary leadership skills at all levels (national, regional, district, institutional)
- v. Focusing not just on knowledge and skills but also attitudinal capacities to develop the right culture with the appropriate mindset, values, and behavior
- vi. Designing appropriate organizational structures at all levels with appropriate reporting structures and integrating mechanisms, people performance management, and people practices.

### d) Special Interest Issues

The ICT in Education policy would not be considered successful if no deliberate effort is put in to ensure that critical special interest needs of the community and youth development are included. These special interest issues will facilitate the closing of the learning loop and create better community, stakeholder and governmental buy-in to the programmes. Doing so would allow those segments of the community that may “fall through the cracks” along the education cycle to continue to receive ICT training along the lines of the ICT Driving License models. Policy direction should thus be set to also adapt and make possible the opportunity to scale the ICT integration into avenues of growth for the learners (especially school drop-outs so they don’t face or become challenges for the community outside of the school environment):

In furtherance of the above, specific attention is recommended for the following special interest areas

- i. **Gender Mainstreaming** - to facilitate expansion and convergence with the girl-child education development policy in particular
- ii. **Convergence and Narrowing of the Rural-Urban Divide** - to guarantee equitable spread of ICT in Education programme by ensuring that logistical deficiencies, locational incentives are fully addressed to attract and sustain personnel in the rural and per-urban areas to give considerable equal

opportunity for learners, given that there is a unified educational system with a common examination system

- iii. **Dealing with Disability & Special Education Needs** - to ensure that every learner (and teacher) with any sort of special needs or challenges can receive equivalent and technologically acceptable facilities to guarantee them same rights of access and opportunity. This means that appropriate hardware and software must also be made available in addition to creating the requisite framework for the training of teachers to handle the special needs of this category of learners. The above would also ensure compliance to the National Disability Laws.
- iv. **Dealing with Out of School Youth & Students in Remedial (exam re-sit) Schools** – to ensure that those who fall through the education cracks at an earlier than expected level either as drop-outs or inability of parents to continue supporting their wards would get the opportunity to utilise some of the facilities as an opportunity to restore themselves onto the learning ladder using the ICT in Education system as a bridge to continued education. A number of initiatives such as that operated by Plan International in Ghana focus on creating such opportunities for youth in the various communities. It is therefore appropriate that these categories of youth learners are taken care of, even if it is considered an offshoot of the policy.

e) **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. Annual reviews and three-year 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.

## **5.2 PLANNING CYCLES**

The achievement of the ICT in Education policy goal that every learner in general and tertiary education and training institutions 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 MOE its agencies and educational institutions.

## **5.3 PHASES OF IMPLEMENTATION**

### ***PHASE I***

#### **Enhance a system-wide and institutional readiness to use ICT for teaching, learning and Administration**

- a) Build an education and training system to support ICT integration in teaching and learning
- b) Build teachers' and managers' confidence in the use of ICT
- c) Build a framework for competencies for teacher development in the integration of ICT into the Curriculum
- d) Establish an ICT presence in schools

### ***PHASE II***

#### **Ensure system wide integration of ICT into teaching and learning**

- a) Curriculum Research and Development Division should introduce and curriculum guideline for ICT integration.
- b) Teachers and managers integrate ICT into management and the curriculum
- c) ICT facilities widely present in schools.
- d) 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**

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

## **5.4 INSTITUTIONAL ARRANGEMENTS AND 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 (MOE)**

The overall responsibility for this policy and its implementation belongs to the MOE. 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.

#### **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:

#### **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, G e S C I, UNDP, USAID, School Net, Computer Aid International, etc.

### **National ICT in Education Coordinating Committee**

Recognizing the crucial role of partners in implementing these changes, the Ministry will see to include a wide cross section of stakeholders in the process leading up to the development of the draft policy. The Ministry remains committed to using a similar consultative approach in developing the implementation plan for the policy as continuing to build a shared vision and soliciting active input and commitment from all stakeholders is seen as an essential part of the process.

Towards this end, the MOE has established an ICT in Education Coordinating Committee to oversee the development of an integration plan to support the ICT in Education Policy objectives and strategies. This apex national body will essentially provide guidance in the entire implementation process and will serve as an advisory body in an effort to:

- a) Provide support and input for the development of a detailed implementation plan, addressing goals, objectives and strategies as outlined in the ICT in education policy, including the financing of the policy
- b) Strengthen and influence the work of the MOE in creating an enabling sector environment in which the objectives of the ICT in Education Policy can be met
- c) Integrate new and existing efforts of different partners at an appropriate level of decision making and implementation of programmes and projects into an accountable, transparent and participatory way to ensure a maximum degree of good governance

### **4.5 The National ICT in Education Coordinating Committee**

The Coordinating Committee will be a multi-stakeholder group, comprised of sector Partners/representatives drawn from different organisations including, but not limited to:

- a. Public sector, including other Ministries, Departments and Agencies
- b. Private Sector
- c. Civil Society
- d. Development Partners
- e. MOE and GES Departments and Agencies
- f. Educational institutions (public and private)
- g. Parents
- h. Students

Additionally, the Coordination Committee will assign Thematic Working Groups for each of the policy's seven focal areas and other relevant issues related to the Implementation plan. The Thematic Focal Points will provide technical and professional advice to the Coordination Committee on specific policy and implementation activities based on their expertise.

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

1. *Provide overall coordination and control over the process on implementation plan development of the ICT in Education Policy, including:*
  - i. Guidance on project implementation plans and activities
  - ii. Sustainability of coordinating mechanisms on the sector level
  - iii. Priorities in implementing sector strategies
  - iv. Financing plan and resource mobilization options
2. *Provide a point of coordination for activities seeking to support the use of ICT in the education sector.*
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. *Receive and review project reports*
6. *Review policies and recommend changes from time to time as needed*

***The Chief Director of the Ministry of Education, will chair the Coordinating Committee with membership including but not limited to representatives of the following Ministries, Departments, Agencies and organisations.***

- i. *National Council for Tertiary Education*
- ii. *Ghana Education Service*
- iii. *Council for Technical and Vocational Education and Training (COTVET)*
- iv. *Committee of Vice Chancellors of Ghana*
- v. *Development Partners*
- vi. *NGOs*
- vii. *Computer and IT industry*
- viii. *Ministry of Communications*
- ix. *Ministry of Local Government & Rural Development*

- x. *Parent Teachers Associations*
- xi. *National Union of Ghana Students*
- xii. *National ICT4AD Committee (Education)*
- xiii. *Ghana-India Kofi Annan Centre of Excellence in ICT*
- xiv. *Ghana Internet Service Providers Association (GISPA)*
- xv. *National Communications Authority (NCA)*
- xvi. *National Education Reform Implementation Committee (NERIC)*

## **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:

- a. Global e-Schools and Communities Initiative (GeSCI)
- b. Microsoft Partners in Learning Programme
- c. NEPAD e-Schools Initiative
- d. CISCO Academy
- e. Oracle Academic Initiative
- f. Science Technology and Mathematics Education (STME) Clinic
- g. Science Resource Centers Project
- h. GLOBE Programme
- i. Intel Initiatives to support education

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

## **5.6 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.

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, cybercrimes, 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.

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.