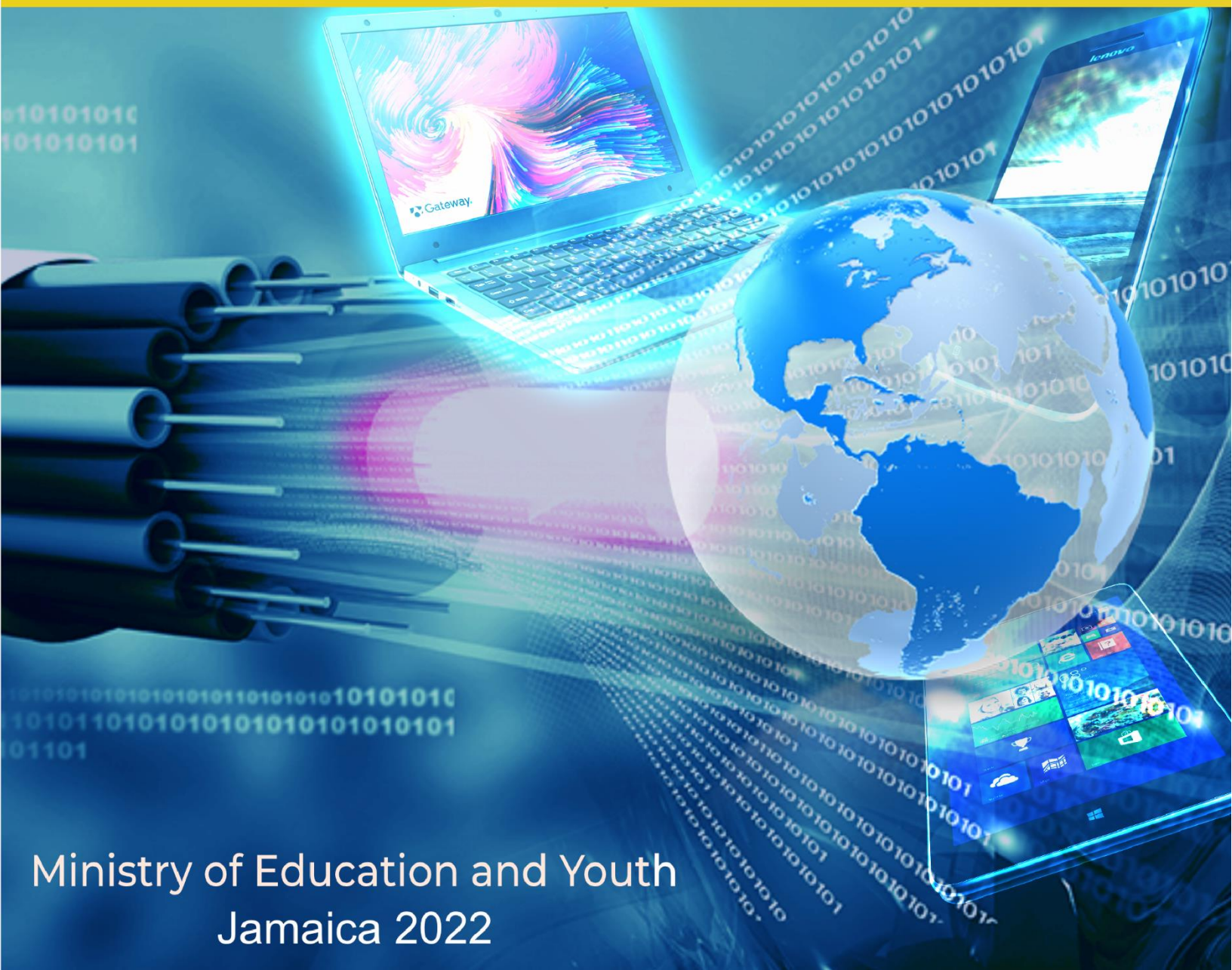# ICT in EDUCATION POLICY

Ministry of Education and Youth
Jamaica 2022

**MINISTRY OF
EDUCATION & YOUTH**

**GOVERNMENT OF JAMAICA
MINISTRY OF EDUCATION AND YOUTH**

ICT IN EDUCATION POLICY

*ICT: Transforming Lives, Empowering Citizens
and Enabling National Development*

FOREWORD

The Honourable Fayval Williams

Minister of Education and Youth
ICT in Education Policy

The rapid growth in Information Communication Technology (ICT) throughout the world has changed and is changing how people live, interact with each other, do business and participate in teaching and learning. Modern computer technologies now make it possible for teachers, students and others to join communities of people well beyond their immediate environment to exchange perspectives, review, analyze, contribute, examine and organize issues logically and in context.

To help our students adapt to these changes, we must not only continue to refresh our curriculum to ensure that the knowledge, skills, and values taught to them remain current and relevant, but also that modern methodologies are employed in imparting and sharing knowledge.

To this end, the Ministry's National Standards Curriculum is predicated on science, engineering, technology and mathematics (STEM) as the fundamental base. The objectives emphasize experiential methodologies and the exploration of the four Cs (critical thinking, creativity, collaboration and communication) which are aimed at improving students' multiple intelligences and interests in an enabling and supportive environment, enforcing the value of discovery learning.

Additionally, e-learning or online learning is becoming increasingly popular thus creating opportunities for schools to ensure that students have access to curriculum materials whilst in the classroom as well as ensuring that students outside the classroom, such as at home or even while in a hospital, can learn.

For us in the education sector, the increased focus on technology allows for an avenue to encourage our students to widen their career prospects and to embrace this field as one in which they can thrive.

We do know, of course, that this can be challenging for varying reasons including:

- Inadequate number of ICT teachers in schools;
- Poor internet infrastructure;
- Students not having devices;
- Students underperformance in mathematics.

The Ministry has therefore taken steps to expand internet access in schools and to provide tablets for students who need them most but whose parents are unable to purchase them on their own.

Here in Jamaica, the Ministry of Education and Youth is making a concerted effort to encourage more students to pursue STEM courses and to see the ICT field as providing desirable careers.

At the Education Ministry, we believe that by improving access to technology and technological devices, we will create a level playing field for all of our students, allowing them to see the endless possibilities that exist for careers in STEM. This is one of the reasons we are strong proponents of our ICT in Education Policy. We believe, that by pushing our five broad strategic objectives, we can move our nation and workforce to match the growing demands of careers in the 21st century.

ICT is a powerful tool that can be used to provide and expand the life-long learning opportunities, which are needed to propel the Jamaican society forward. With the move to expand technology access to schools, there is the need for the development of adequate and culturally relevant interactive resources to support learning of concepts and acquisition of skills in all subject areas.

In addition, the benefits of ICT in education are of such that students in the classroom can all learn from the curriculum material. Students with special needs are no longer at a disadvantage as they have access to essential material and special ICT tools to make use of ICT for their own educational needs. ICT use encourages collaboration. It brings children together where they can talk and discuss what they are doing for their work and this in turn, opens up avenues for communication thus leading to language development.

Within the context of the foregoing, I trust this policy will be used by our educators to develop programmes that will engage students to use the tools at their disposal to be innovative and creative as they pursue their education.

PREAMBLE

The knowledge-based, technology-driven world demands that the Jamaican Education System leverages Information and Communication Technologies (ICTs) to equip citizens with literate, numerate and ICT skills, in the context of national development to advance citizens' competencies for critical thinking, complex communication and innovation as well as social and personal responsibility in the digital world.

This policy will provide the framework for the appropriate provisions, use and management of ICTs in Education. It will apply to all institutions providing educational programmes and services that are consistent with the standards for quality education.

Challenges and Opportunities in the Adoption of ICTs in the Education Sector

The education sector is universally recognized as the foundation of any country's human resource development and as such is charged with the responsibility of developing policies that guide advancement of this process. Given the appropriate support and systems, the use of ICTs within the education system will aid the fundamental achievement of the national goals and more specifically National Outcomes # 2 and 11- world class education and training; a technology-enabled society. The adoption of ICTs in the Jamaican education system will require financial resources. However, developing countries, such as Jamaica, are faced with resource challenges which could impede the adoption of ICT in the education system. Sustainability, in this regard could be a major risk. Therefore, the implementation of this policy will require partnerships between private and public sectors as this will be an essential factor for success.

For the successful integration of ICT in education and to ensure its sustainability, a comprehensive framework and a rolling Master Plan must be in place to guide the implementation and management of the policy.

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LIST OF FIGURES

ABBREVIATIONS

BPR	Business Process Reengineering
BYOD	Bring Your Own Device
CFT	Competency Framework for Teachers
CKLN	Caribbean Knowledge and Learning Network
CPC	Central Programme Coordination
CPM	Central Programme Management
DIQ	Digital Intelligence Quotient
EMIS	Education Management Information System
ERPS	Enterprise Resource Planning System
FOSS	Free and Open Source Software
ICT	Information and Communication Technologies
JREN	Jamaica Research and Educational Network
KPI	Key Performance Indicators
MDAs	Ministries, Departments and Agencies
MOOCs	Massive Open Online Courses
NESP	National Education Strategic Plan
OER	Open Educational Resources
ROI	Return On Investment
SLA	Service Level Agreement
TCO	Total Cost of Ownership
TOC	Theory of Change
TVET	Technical Vocational Education Training

INTRODUCTION

Jamaica is an integral part of a challenging and dynamic global village marked by intense competition and shifting competitive advantage. In this global village, technologies, current ideas, and values are being replaced at an increasing pace. Demands for new 21st century skill set in the labour market have prompted the need for educational opportunities and the reconceptualization of learning, especially in ICT related areas.

ICTs are increasingly fostering financial, social and educational competiveness and personal freedoms, revolutionizing the digital space[1]. The continued advances in this digital culture are creating steeper disadvantages for students and workers who are not digitally literate and can only be remedied with the full incorporation of ICTs at every level of the education system. Education through the use of ICT is therefore central to preparing the population to meet the demands of this new and evolving environment, where knowledge and information are needed to navigate successfully.

ICT integration provides a dynamic and proactive teaching-learning environment that can contribute to effective learning when teachers are fully equipped and prepared in the use of ICT tools.[2] Constructivism through its fundamental elements of exploration, investigation, discovery, explanation, questioning, critical thinking and problem-solving requires the implementation of ICT tools in curriculum instruction to facilitate the authentic learning experiences in the classroom. This pedagogical orientation supports teachers' efficiency in the use of ICT for classroom instruction and further support inclusion and diversity that will advance the learning opportunities for students at all levels of the education system.[3]

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[1] UNICEF- The State of the World's Children; Children in a Digital World

[2] Teaching and Learning with Technology: Effectiveness of ICT integration in schools.

[3] Digital Strategy for Schools 2015-2020: Enhancing teaching, learning and assessment.

ICT is therefore highlighted as having the potential role of aiding the transformation of teaching, learning and assessment practices in very positive ways and ultimately enhancing student learning as they live and work in the modern globalized society[4].

The foregoing is essential to Jamaica as the country emerges from a developing to developed status, thereby becoming the "place of choice to live, work, raise families and do business". The development of its human capabilities therefore is a key factor in building an innovative culture to achieve a competitive edge in the global marketplace. The Government has recognized its responsibility to ensure that every Jamaican child has the right to quality education. Rapid technological advances and the move towards a knowledge-based society have necessitated a reassessment of the content and the preparation of learners to better face the challenges of the 21st Century. The education sector is universally recognized as the foundation of any country's human resource development and as such is charged with the responsibility of developing policies that guide the advancement of this process.

Quality Education and Training is a key policy priority of the Education System and with the appropriate support and use of ICTs, the promotion of lifelong learning and innovations will ultimately engender the citizenry that will lead to the development of a more competitive nation. It is against this background that the ICT in Education Policy is required to provide the framework for the transformation of the nation.

The infusion and integration of ICTs will also have long-lasting benefits for educational outcomes and efficiency in governance of the sector and propel Jamaica towards achieving the goals of Vision 2030, Jamaica National Development Plan.

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[4] Digital Strategy for Schools 2015-2020: Enhancing teaching, learning and assessment

SITUATION ANALYSIS

Education in Jamaica is administered primarily by the Ministry of Education and Youth (MoEY), through its Central Ministry, Regional Offices, Departments and Agencies. The Education System consists of four levels: Early Childhood, Primary, Secondary and Tertiary. Formal education is provided mainly by the Government of Jamaica through allocations from the national budget. The Ministry also partners with Churches, Trusts as well as independent or private schools.

In 2006, the Government began implementing the recommendations of the National Education Task Force. Incorporated in these recommendations were the engagement of teaching and learning using distance modalities, advancing the implementation of the ICT Policy, training of teachers in the use of ICT and providing internet access to all schools using wireless technology if necessary. These recommendations are being timely responded to through the development of programmes, projects and new curricula geared toward improving quality, equity and access in the education system[5]. The implemented initiatives are expected to improve the competencies of Jamaicans and to establish proper systems and structures that are necessary for contributing to the global economy.

The demand for the use of ICTs in the delivery of instruction at the early childhood and primary levels is great. At the secondary level, the use of technology is more prevalent, though not at the desired level. Under the e-Learning project, all public secondary schools were equipped with technological devices and training to facilitate teaching and learning as well as 16 of 77 (approximately 21 %) private schools. The culture however had not yet evolved to a state where the integration of its use in schools meet with 21st Century demands. At the tertiary level, the use of ICTs is more advanced, particularly at the major universities however, teacher-training institutions and other institutions require further interventions to ensure adequate capacity building. One of the major challenges the education system faces is insufficient resources to improve the ICT infrastructure so that a coordinated approach to the utilization of ICTs in the delivery of educational content can be achieved.

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[5] Task Force on Educational Reform Jamaica; A Transformed Education System, 2004

The Open Educational Resources (OER) have been serving to improve and increase educational and technological resources for educational institutions at all levels. They have grown significantly and are impacting educational development globally both formally and informally. They have been enhancing the opportunities of citizens to engage in lifelong learning which supports modern economies. There have been challenges with access of some educational materials due to copyright licenses at national and international levels, however continued changes are being made to create a more flexible and open licence practice to achieve Sustainable Development Goal 4 and the Education 2030: Framework for Action[6]. The goal of all countries is to provide inclusive and equitable education and lifelong learning for all, however, this achievement will only be realized when all countries invest in alternative and innovative means that will expand the access to lifelong learning opportunities in all settings and all levels of the education system[7].

The investments of ICT in the Jamaican Education System have increased exponentially since the COVID-19 Global Pandemic. The educational orientation of the system embraces the constructivist learner centric model and the use of ICT tools are being fully adopted in the teaching and learning process. Educational instruction has pivoted, where Distance/Remote Learning has become the main mode of instruction. It incorporates online/ computer aided education, audio/visual education, and printed material. Within this new

dispensation, internet connectivity and equity in access is inevitable as there is need for each educator and student to be tooled with a technological device to effectively operate within this digitally advanced teaching and learning space. Considerable efforts are being made to ensure each child and teacher own a device. The MoEY and its agencies have been training and providing additional professional development for educators in the effective use of ICT tools to facilitate learning and assessment and there is also the establishment of the Learning Management System (LMS).

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[6] UNESCO (2016). Open Educational Resources: Policy, Costs and Transformation

[7] UNESCO (2016). Open Educational Resources: Policy, Costs and Transformation

There have been consistent efforts to improve the level of connectivity at the school level to ensure greater advances to meet this technological demand, however, with all these initiatives and thrust towards the development of a more comprehensive digital model for the education system, insufficient resources and ICT Infrastructure as well as the full utilization of ICT tools in the facilitation of the educational instruction still remain a challenge. Data received from the system indicated that 725 of 975 schools at the primary and secondary level**s**, included in the School's Vulnerability Risk Matrix for 2020 have internet availability. Of this number, only 348 have reliable internet.

ICT has become ubiquitous in the 21st Century. It is now the main enabler of knowledge-based societies. ICTs have been recognised globally for its ability to develop information-based societies; however, this does not come without the required investments and political will. Many countries such as Ghana, Malaysia, Trinidad and Tobago, Antigua and Barbuda, and Korea, have recognised the advantages ICTs can bring to the education system and have developed policies and programmes to utilize ICTs in this regard. ICTs in the education system will provide innovative teaching and learning resources. This will motivate teachers and learners to be more imaginative, creative and innovative thus transforming learning.

The skill sets of future generations are fundamental to the personal, social and economic development of the country. Therefore, the motivation for the ICT in Education Policy is based on the potential of using ICTs to improve the overall quality of education delivery and management to ensure citizen transformation through the education system, a roadmap bounded by a comprehensive ICT in Education Policy which is an imperative.

Figure 1 gives a summary of the Potential of an ICT in Education Policy and Plan in Jamaica.

Figure 1

The Potential for an ICT in Education Policy
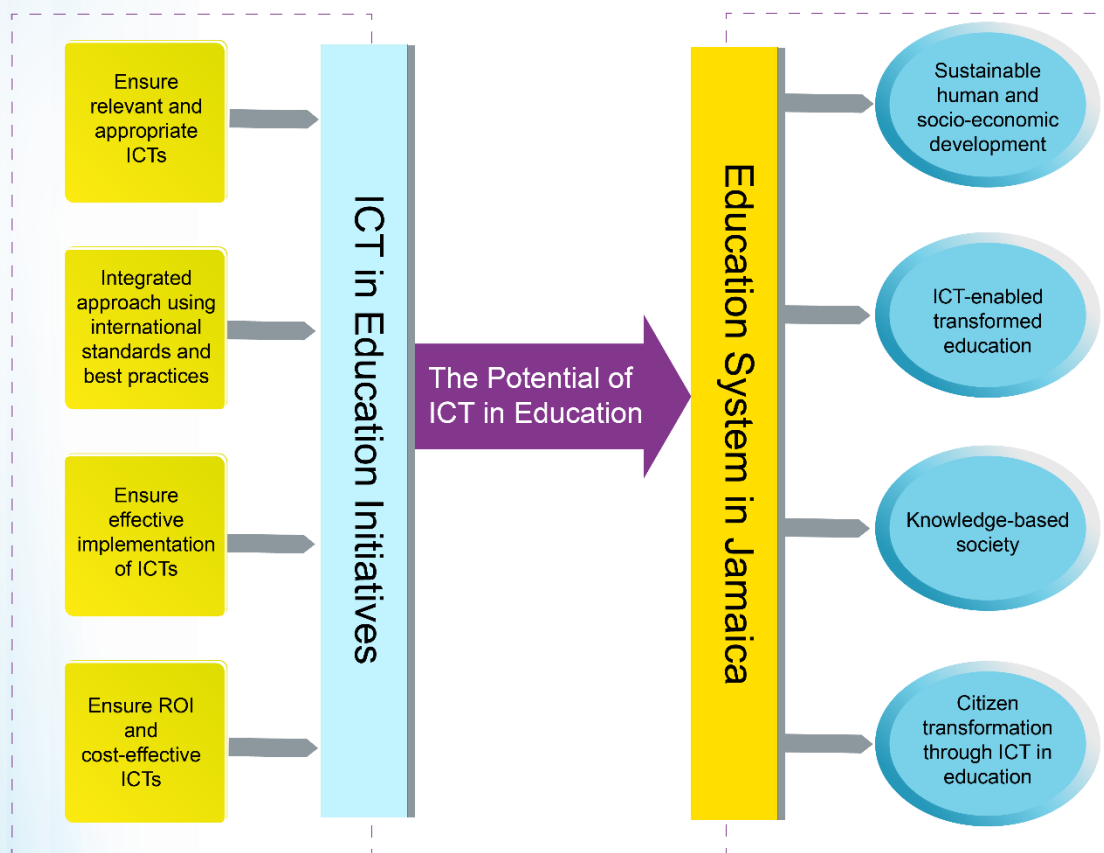
The absence of a clearly defined policy and plan to guide the use of ICTs in the delivery of educational services, has led to inadequately designed programmes and ad hoc implementation of programmes aimed at technology integration in education. This further contributed to an under-resourced education system that impedes timely decision making and also results in lack of standards and inadequate leveraging of ICTs for better educational outcomes.

The establishment of a policy helps to ensure that relevant and appropriate ICTs are utilized, integrated approach is undertaken, value added ICTs with minimal total cost of ownership (TCO) are chosen, effective implementation is achieved and ultimately the desired return on investment (ROI) in a cost-effective manner are realised. With the successful adoption of an ICT in Education Policy, there are specific benefits to the overall education system.

Figure 2

Strategic Vision for ICT in Education Policy

Transform the Teaching & Learning Process

Provide Learning Opportunities for All

The Successful Adoption of an ICT in Education Policy will:

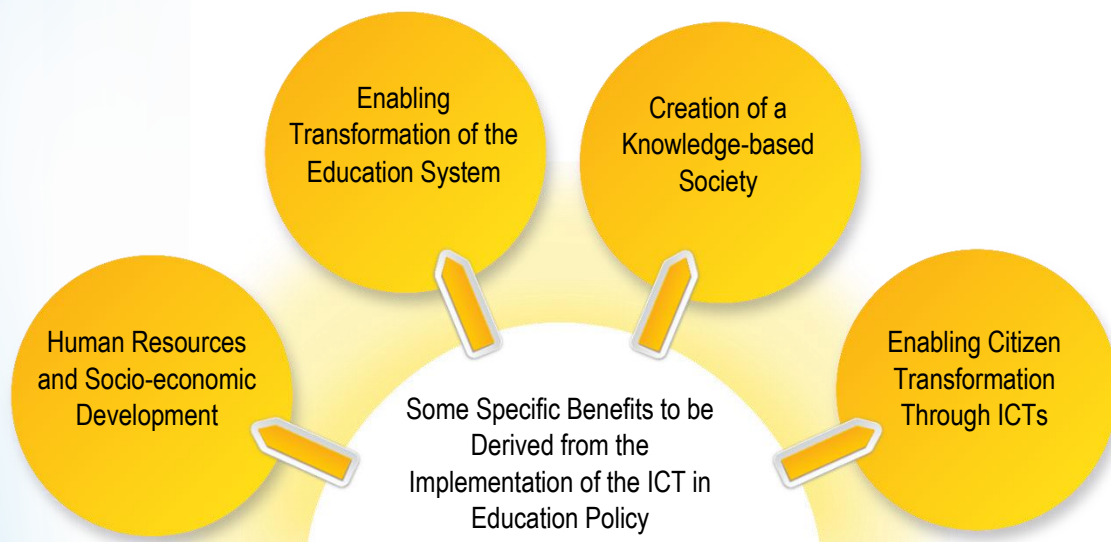Develop the Capacity for Efficient Management and Administration of the Education System

Promote the Development of ICT Innovations
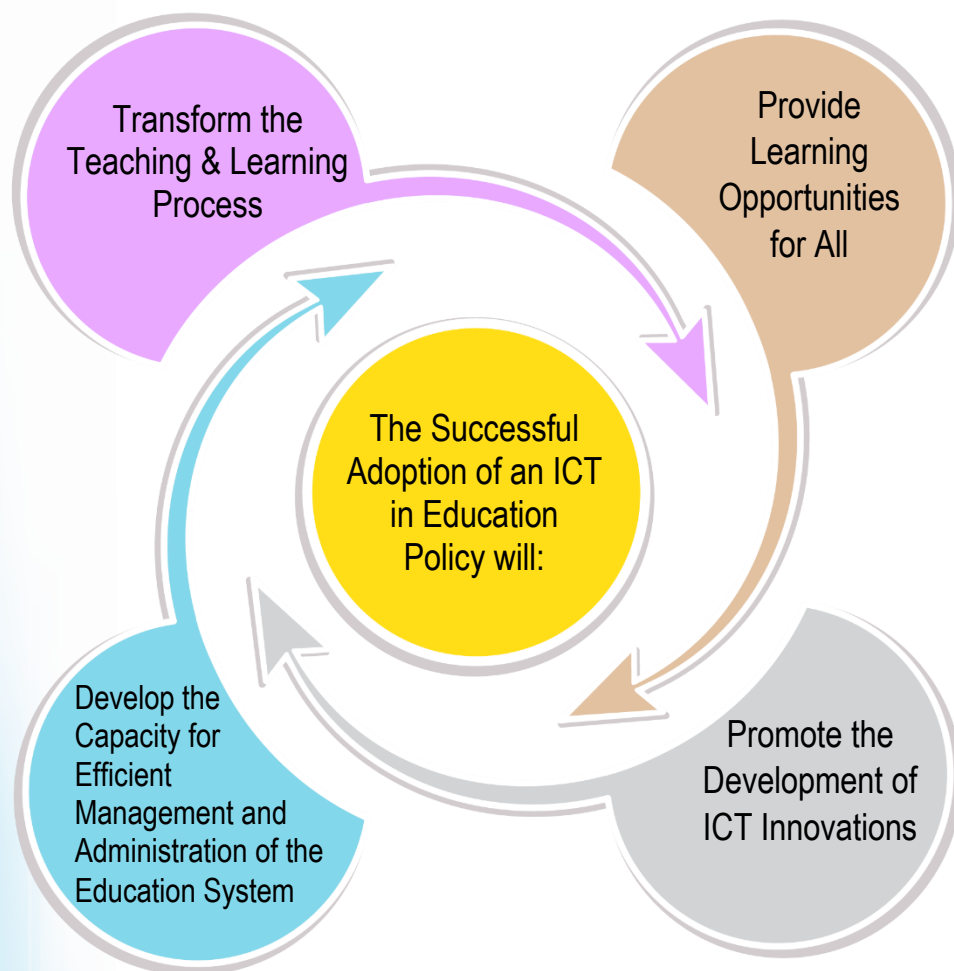
In addition, there are some specific benefits to be derived from the implementation of the ICT in Education Policy.

Figure 3

Conceptual Framework (Roadmap) Showing Links Between the ICT Policy and Outcomes

The ICT in Education Policy will be a vehicle to transform teaching and learning and administration in the nation's education system. The Policy will provide the framework for the Government through the MoEY to keep pace with technological advancements, so that all learners and educators will have equitable access to relevant, current and emerging technologies.

It shall encompass a set of long-term goals, guiding principles, philosophy and imperatives, to embrace a systematic and lifecycle approach to ensuring successful implementation and progress of all ICT initiatives in education. The policy framework should deliver an effective system of education through the integration of appropriate ICTs in the Jamaican education process. The Government through the MoEY will lead the ICT in Education Policy for public educational institutions, and serve as a guide for private educational institutions, that are required to provide quality education.

Vision

'ICT: Transforming Lives, Empowering Citizens and Enabling National Development'

In support of Jamaica's national vision of producing world-class citizens, the ICT in Education Policy envisions that the Jamaican education system will use appropriate ICTs. These will be used to support and equip citizens with literacy, numeracy and ICTs skills, and to develop competencies for critical thinking, complex communication, and innovation, personal and social responsibility in the digital world.

This vision is guided by the understanding that the infusion of ICT at the different levels of the education system will require innovative approaches inspired by technologies and driven by relevant models of pedagogy.

The education system in Jamaica seeks to develop world-class graduates capable of using technology to learn and create opportunities for personal and national development. If this vision is to be realized, the infusion of ICT in education must:

[i]   Influence the development of effective learners who display natural tendencies to wonder, investigate, solve problems and think critically in order to build knowledge and become lifelong learners.

[ii]   Ensure that all learners are confident, creative and critical users of current and emerging technologies, with an understanding of how these technologies impact human development.

[iii]   Support the education of all learners and administrators and enable them to take full advantage of the potential of ICT to transform the teaching and learning environment.

[iv]   Promote creativity and innovation among communities of learners and educators in developing local ICT-based products and services.

[v]   Enable effective administrative processes to achieve educational outcomes for all learners.

Mission

To ensure that the education system of Jamaica enables the development of citizens who can effectively use ICT tools and resources to develop the necessary skills, knowledge and attitude to participate actively in the national and global society; for the creation of wealth and the improvement of the quality of life.

Policy Statements

There are four main statements that will be the cornerstones for the ICT in Education Policy:

1. The ICT in Education Policy is based on the recognition of knowledge as a necessary premise for sustainable human resources and socio-economic development. The Policy and Plan therefore seek to provide a road map for public, private and community partnership to drive the fundamental changes required for the transformation to the fourth industrial revolution and beyond;

2. ICT as an enabler for education will be distributed through five main dimensions of delivery – human resources, budget, ICT-enabled learning resources, infrastructure and culture;

3. ICT in education focuses on the adoption of value-added ICTs, management tools and relevant concepts from international standards and best practices such as Total Cost of Ownership (TCO), Public Private Partnership, Lifecycle Approach, appropriate Models of Change, Business Process Reengineering (BPR), and Central Programme Management (CPM)

4. ICT in education focuses on equity in providing learning opportunities for all, especially learners with special needs and industry specific training, such as Technical Vocational Education Training (TVET), to give them equitable opportunity as Jamaica transition to a developed country.

Guiding Principles

The following principles will guide the successful implementation of the ICT in Education Policy:

- Instrument of Development – ICT to be used as an enabling tool in the process of developing human resources;
- Learning Resource Development- creating developmentally appropriate and culturally relevant content
- Ethical boundaries of ICTs- promoting and providing the guidelines for responsible use based on core values
- Promoting inclusivity –enabling equity in access to quality education for all learners
- Sustainability - Learning for the future.

Philosophy

Stakeholders in the education sector have the potential to responsibly use ICT to create an enabling and nurturing environment in which all people thrive and contribute to the sustainable development of the national and global communities.

POLICY, GOALS, OBJECTIVES AND STRATEGIES

POLICY GOAL 1

TRANSFORMING THE TEACHING AND LEARNING PROCESS

OBJECTIVES	STRATEGIES **The Government will:**
Enabling effective teaching and learning to improve outcomes of education, leading to a knowledge driven citizenry	• Provide students with a supporting environment to better manage their learning. • Promote and encourage the use of digital materials in the Increase access to ICT resources – for example, ICT tools, content, and connectivity. • Establish framework for mind-set change. • Create teacher networks to exchange ideas and share successful practices to build and sustain competence. • Provide ICT appropriate opportunities and resources to align educational practices to the emerging expectations of the outcomes of education, as well as the teaching and learning process. • Support teachers and researchers who are engaged in the development of digital resources. • Collaborate with content developers in adopting digitally based approaches for the development of teaching and learning. • Use ICT opportunities to foster effective governance and leadership to strengthen professional competence, leading to improved learning outcomes.

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POLICY GOAL 2

LEARNING OPPORTUNITIES FOR ALL

OBJECTIVES	STRATEGIES The Government will:
Increase access to technology that leads to equity in the education system	• Create an ICT-based education system that motivates all learners to engage meaningfully in education regardless of their abilities (inclusive of special needs) gender and socio-economic circumstances. • Enhance the data collection, analysis and reporting capabilities of the Management Information System (MIS) to strengthen the information driven approach for interventions to improve learning for all. • Develop specialized ICT based Individualized Intervention Programmes (IIPs) for persons with disabilities. • Undertake capacity building for educators in the use of technologies to foster equity in education (including special needs students). • Undertake capacity building for parents and other stakeholders to make the transition to an effective ICT learning environment. • Facilitate continuous development for digital learning.

POLICY GOAL 3

EFFICIENT MANAGEMENT AND ADMINISTRATION OF THE EDUCATION SYSTEM

OBJECTIVES	STRATEGIES
	The Government will:
Strengthen the management practices and procedures of the Ministry, its Agencies and the school system	• Implement an Education Management Information System (EMIS), infrastructure and services to improve the effectiveness of governance, management and administration of the education system for more timely and targeted response to developmental needs.
	• Facilitate capacity building initiatives and institutionalizing successful ICT practices toward improvements for the governance and management in the administration of education.
	• Upgrade and retrofit schools' infrastructure to facilitate teaching and learning utilizing ICT tools.

POLICY GOAL 4

PROMOTING THE DEVELOPMENT OF ICT INNOVATIONS

OBJECTIVES	STRATEGIES **The Government will:**
Increase the cadre of digital entrepreneurs/innovators	• Strengthen research and innovation in the application of ICTs in all learning institutions. • Facilitate and promote creative expressions through the utilization of ICTs. • Promote and provide entrepreneurship training in ICTs at all levels of the education system.

The Importance of ICTs in the transformation of the Jamaican society and more significantly for the advancement of education requires the identification of possible challenges/ consideration that must be taken to ensure its effective implementation through organized approaches to close the identified gaps. There are identified challenges that have the potential of limiting the integration of the ICT technologies in the teaching learning process and furthering its advancement. Some of these challenges include but are not limited to shortage in financial, human and other resources to procure tablets for all educators and learners; access to internet services; the utilization of servicing and replacement of equipment; inadequate response to online training. To ensure that these identified gaps are closed, the implementation of the ICT in Education Policy hinges on the following considerations:

Financial

The budget should be one of the focal points during the planning stage for activities and programmes relating to ICT in education. Each programme must be sufficiently budgeted to ensure that the financial resources are available to execute the activities and maintain and support post implementation processes. Partnership among Government, local, regional and international donors will be critical to securing financial support and other resources for ICT in education programmes. Continuous collaboration between Government Ministries responsible for ICTs, private telecommunications service providers and other private and public stakeholders must be initiated and sustained to garner budgetary support.

This ICT in Education Policy supports the use of Free and Open-Source Software (FOSS) and open standards within the education system. These could also help to reduce the investment and promotion in the development of applications relating to ICTs in education initiatives. However, for the purposes of this policy, careful evaluation of FOSS must be done prior to any final decision for its utilization.   The TCO of FOSS must be assessed to ensure that the appropriate systems that meet user requirements and the overall needs of the education system are selected within the context of affordability.

The policy also supports and promotes the use of Open Educational Resources (OERs) at all levels of the education system. The OERs will help to increase access to a wide variety of resources and materials within the education system in digital and electronic form. The cost of acquiring, distributing, storing, and replacing hard copy textbooks and other learning materials is greater than the government can sustain in the medium to long term. The use of OERs is a cost effective and efficient approach of acquiring and distributing learning materials within the learning communities. The increasing global use of OERs has been made possible by flexibilities in licensing and copyrighting of materials. Free online courses such as Massive Open Online Courses (MOOCs) can be accessed on digital platforms to facilitate industry demand, continuous lifelong learning and support cost effective implementation.

Capacity Development

Steps must be taken to develop the capacity of all stakeholders who will be involved in the process to guarantee successful implementation of the ICT initiatives.   The right skills are required to ensure good project management, use of appropriate methodologies, and developing the pedagogical competencies of curriculum teams and building professional competence of employees to improve the quality of education. Competent personnel are also needed for change management to ensure that all stakeholders champion the cause for transformation of the education system.

ICT-enabled Learning Resources

At the central point of all initiatives and programmes regarding ICT in education is the ICT- enabled learning resources dimension. These are the essential tools, which will enable learners' creativity and innovation, problem solving skills, analytical skills, and other relevant skill sets required to support national development. A strategic and structured approach such as the use of a lifecycle and project management successful practices must be employed to develop and manage the ICT-enabled resources.
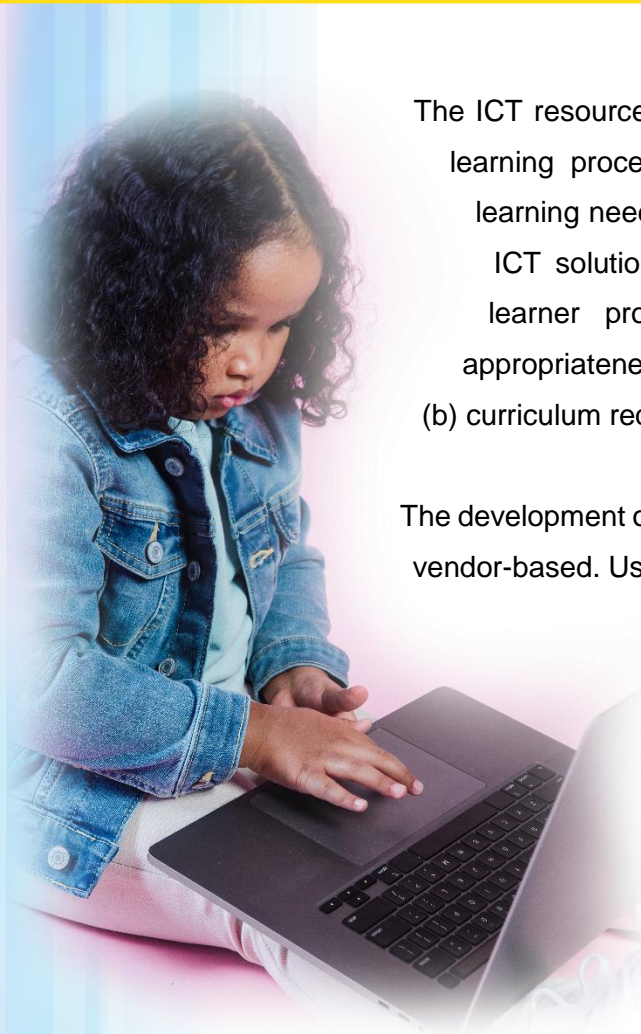
The ICT resources and tools selected will support the teaching and learning process to facilitate students (at all grade levels and learning needs) to maximize their learning potentials. Therefore, ICT solutions new and/or emerging should be based on (a) learner profile, in terms of stage of development, age appropriateness and grade levels, special needs, health risks and (b) curriculum requirements.

The development of resources for learning must be user-based and not vendor-based. User specifications and not vendor specifications must be the basis of developing ICT-enabled learning resources. Therefore, the development of user requirements and needs analysis must be properly defined before digital resources are developed. The procurement/selection of ICT tools should facilitate student centeredness as articulated in the curriculum. The materials used to develop learning resources must adhere to copyright laws and regulations.

ICT-enabled Learning Resources

A robust integrated and smart infrastructure is required as the foundation of ICT in education. The infrastructure should provide the platform to empower educational institutions to advance and adopt ICT tools and applications. The ICT infrastructure should:

- support the capturing of "Big Data";
- support the improvements in the design of the curricula;
- facilitate access by all learners to quality resources.

Considerations for network and information security must also be an input for this dimension to ensure optimum availability of ICT tools and must comply with the national data protection policies and acts. This is important as unavailability of resources due to data security and other security issues could create significant risk to the use of ICTs in education.

It is also critical that physical infrastructure and an appropriate legal framework are considered as necessary elements to the success of an ICT-enabled education system. A robust physical infrastructure will help to foster and support a user-friendly and safe environment for ICT use in the education system.

Environmental Perspective & Considerations

All ICT related materials and equipment must be environmentally friendly and adhere to best practices of local and international guidelines, procedures and standards. It is expected that the choice of ICTs for educational purposes will require the use of less paper and will be efficient in energy consumption. The procurement, donation, and other forms of acquisition should conform to minimum specifications developed by the MoEY in conjunction with the entities/Ministries such as the ICT Authority and the Ministry of Science, Energy and Technology. 'Dumping' of equipment is prohibited.

The disposal of hazardous waste and ICT tools should conform to national environmental standards in keeping with environmentally safe and sustainable practices. Health and safety standards must be observed at all times during and after the implementation of ICTs in the education sector. General and occupational health and safety standards include prolonged use of computers that leads to physiological issues such as obesity, eye problems, stress and poor ergonomically designed systems and work environments, respectively.

6 ICT Culture

A paradigm shift from the traditional processes of teaching and learning will be required if meaningful transformation is to take place when ICTs are deployed in the education system. Reorientation to new methodologies/competencies and approaches to teaching and learning should form part of the curriculum at all training institutions and professional development courses for in-service teachers. The community and stakeholders in education should be made aware of the new requirements for an ICT enriched education system. In the transformation process, ICTs should be used to promote national, regional and global culture.

7 Security

ICT and network security are very important considerations and must be assessed in any risk management initiative. Cyber and data security must be emphasized at all times during implementation of any ICT in education. A secure infrastructure is necessary to deliver uninterrupted ICT services to support and enable education in Jamaica to move forward in support of the national goal of becoming a developed country.

8   Management

There must be a mechanism for managing ICT in education programmes. This includes programme management, process management, vendor management, risk assessment and management, and crisis management. Awareness sessions of the proper use of ICT tools and applications are required for all relevant stakeholders.

9   ICT for Special Education

Special groups in the context of this policy refer to any group of learners who require special interventions to access learning opportunities. Persons with special needs include but are not limited to the following groups of learners:

- Those with special educational needs, including those considered to have emotional, behavioural, sensory, physical, or mental disabilities;
- Those who are gifted and talented;
- Those with social difficulties, such as street children and wards of the State.

ICTs should be applied where possible and appropriate to enhance learning for individuals with special needs. It may be the only means by which persons with special needs can be trained and prepared to be self-sufficient and reliant. Equal opportunity for all is the ultimate objective.

10   ICT for Lifelong Learning

The ICT in Education Policy supports the concept of Life Long Learning, which seeks to provide the opportunity of continuous, relevant, flexible, and just-in-time training. ICT tools appropriately used and supported can benefit employability, personal development and civic participation to support lifelong learning.

ICT for Technical & Vocational Education

The ICT in Education Policy recognizes the important role Technical Vocational Education and Training (TVET) plays in the development of a country's economy. ICTs will assist in the development and delivery of the TVET courses to expose learners to ICT skill sets. Through the use of ICTs, the inclusion of TVET at all levels in the education system should be promoted.

IMPLEMENTATION

The implementation of the Policy directions will be done through the use of a comprehensive Rolling Master Plan which will serve as the guide for the execution of strategies and programmes.

For this policy and its associated Rolling Master-Plan to be a success, it is essential for the following to be considered:

1. A collaborative approach, through the establishment of a multi-sectorial team with responsibility for championing the initiatives and programmes of the ICT in Education Policy. It is critical that this be done within the remit of the MoEY's annual budget.

2. Discussions should be ensued with key partners to obtain sponsorship and buy-in for its implementation additionally to the approved budget.

3. Partnership and collaboration with stakeholder Ministries, in particular, those with portfolio responsibility for ICTs, finance and planning, must be pursued in a timely manner.

4. The Office with responsibility for ICT within the MoEY must play an important role in ensuring there is functional alignment with ICTs and the overall strategic objectives of the MoEY; also empowering all arms of the Ministry to be efficiently equipped in ICT skills through competency based developments that are aligned with the national goals.

5. Governance Mechanism and Central Programme Coordination (CPC).

   ├ The National ICT in Education Steering Committee will be the governance mechanism that will oversee and manage all initiatives pertaining to the implementation of the ICT in Education Policy.

   ├ An ICT Central Programme Coordinator (CPC) should be employed to manage ICT in education initiatives and liaise with the heads of the relevant MDAs. The Coordinator should report directly to the Chief Education Officer.

MONITORING AND EVALUATION

An important phase of the implementation of the ICT in Education Policy is the monitoring and evaluation of all ICT initiatives and programmes. It is essential to gather users' requirements and feedback from the learning communities through the use of various monitoring and evaluation tools. This provides evidence based analysis permitting the plan to be reviewed periodically as informed by the outcomes of implementation.

The Monitoring and Evaluation (M&E) framework will ensure the gathering of evidence to inform policy formulation on ICT integration, its use and impact on the education system. Data gathered during M&E will also give guidance to the formulation of improved management, and accountability systems, and provide better understanding of the increasing role of ICT in knowledge formulation and acquisition of new skills and competences demands of the evolving industries. M&E will also provide insight to the kind of values and attitudes that are required to shape the societies of the 21st Century.

LEGISLATIVE FRAMEWORK

The legislative framework that will have specific implications to the overall implementation of the ICT in Education Policy is the ICT Authority Act. The said Act seeks to establish the ICT Authority who will lead the charge in streamlining ICT spend; driving efficiency and effectiveness; reducing unnecessary bureaucracy; and improving service delivery across and within MDAs. The ICT Authority will ensure the consolidation and delivery of services across Government through a range of modalities, while establishing a mechanism for the development of directives, codes, standards and guidelines for the acquisition, use, interoperability, security, reliability and management of ICTs and ICT related systems and services.

Further, the ICT Authority will seek to promote and support the development of competencies and professional standards in order to equip and retool ICT staff, thereby increasing the efficiency and productivity of ICT staff and the public sector workforce by extension.

Existing legislation will also need to be reviewed within the context of the policy and amendments made where necessary. Some of the key pieces of legislation to be considered are The Education Act, 1965, The Education Regulations,1980, The Cybercrimes Act and the Data Protection Act. Consideration must also be given to new and emerging mechanism for citizens' identification at the national level.

LINKAGES WITH OTHER POLICIES AND PROGRAMMES

The ICT in Education Policy is formulated within the framework of international and national priorities.

Among these are:

├ **United Nations Sustainable Development Goals** and in particular,

- Goal 4: Quality Education – "Ensure inclusive and equitable quality education and promotes lifelong learning opportunities for all".

  - Target 4.b -By 2020, substantially expand globally the number of scholarships available to developing countries, in particular least developed countries, small island developing States and African countries, for enrolment in higher education, including vocational training and information and communications technology, technical, engineering and scientific programmes, in developed countries and other developing countries

- Goal 9: Industry, Innovation and Infrastructure- "Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

  - Target 9.C- Significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet in least developed countries by 2020.

├ **Jamaica's National Developmental Plan, Vision 2030** and in particular

- **Goal 1** – "Jamaicans are empowered to achieve their fullest potential" which is aligned with National Outcome 2: World-Class Education and Training.

- **Goal 3**- : "Jamaica's Economy is Prosperous" which is aligned with National Outcome 11: A Technology Enabled Society

├ **Government of Jamaica Information and Communications Technology (ICT) Policy**
The policy's vision is for a knowledge-based and educated society that is globally competitive and productive; giving rise to the strategic placement of Jamaica as the key ICT hub within the region.

├ **BYOD Policy Guidelines**, which support schools, to enable students to bring their own technology and devices to school solely for the purpose of enhancing the learning process and by extension, help to relieve some of the budgetary constraints on the government.

├ **Draft Data Collection and Information Sharing Policy** -The policy is intended to facilitate standard collection and appropriate sharing of data between government entities to inform decision-making and enhance service delivery.

POLICY REVIEW

Due to the dynamic nature of this industry, the ICT in Education Policy is expected to have a five (5) year life span; however, depending on the availability of resources the life of the policy could be extended through the implementation plan. The timeline for reviewing the policy is once every year for the first two years and once for the following three years or earlier if necessary. The rolling Master Plan will be reviewed annually to keep abreast of the changes in the industry and to make adjustment based on needs and requirements.

CONCLUSION

Countries such as Singapore, Finland and Australia have used ICT in Education Policies to transform their education system, develop the capabilities of their people and ultimately the economy. With Vision 2030 in sight, the performance of the education system plays an integral role in achieving national goals and objectives. The ICT in Education Policy is a necessary component if Jamaica is to become a developed country. It is therefore critical that all stakeholders support the partnership required for, transforming lives, empowering citizens and creating a sustainable economy that will make Jamaica the place of choice to live, work, raise families and do business.

Specific Outcomes of the Policy

The specific outcomes of the ICT in Education Policy is aligned with the national goals of improving access to quality education and providing world class citizens as outlined by the Vision 2030, and the Sustainable Development Goals. The specific outcomes include:

a) **Learning Opportunities for All**
- An ICT-enabled education system that leads to citizens with world class skills to support the national development agenda.
- Sustainable improvement in the quality of education through performance measurement and monitoring.
- A culture embracing ICT in education that encourages equitable opportunities for learners with special educational needs at all levels.
- An education system that promotes and develops lifelong learning and TVET in schools.
- An ICT-based education system that inspires interest to learn and increase attendance in schools.

b) **Transforming Teachers and Teaching**
- An education system in which facilitators use ICTs in the teaching and learning environment to encourage learning and improve students' performance and for effective management of the learning process.

c) Transforming Student Learning

- o Integrated ICTs within the curriculum and assessment; using ICT Curricula Integration Standards
- o Encourage critical thinking, problem solving, decision-making, and digital citizenship that include the values inherent in collaborating and communicating through the integration of ICTs in the education system.

d) Empowering Education Management and Administration

- An ICT-enabled education system that produces a cadre of human resources with ICT competencies and relevant skills. These skills will be utilized at the MoEY and school administrative level including principals and head of educational institutions, teachers, ICT coordinators, helpdesk and students.
- An ICT-enabled education system that leads to efficient and effective management of business processes and resources; example the use of EMIS.
- An Enterprise Resource Planning System (ERPS) for education that provides the capabilities for research, statistical functions, data mining and business intelligence through data and knowledge management best practices and international standards at the macro, meso and micro levels: example tracking the cost of educating a child through the entire education system, and facilitating research for further policy development such as identifying areas requiring special interventions.

e) Nurturing Talents and Innovation

- A transformed citizenry using ICT skills to develop innovative ideas that lead to entrepreneurial activities, national branding and ultimately contribute to national development for example, developing local apps and model and character animation products.

GLOSSARY

Business Process Reengineering

Radical business redesign initiatives that attempt to achieve dramatic improvements in business processes by questioning the assumptions or business rules that underlie the organization's structures and procedures.

Education Management Information System (EMIS)

This is an information system that provides management information for support, monitoring, and decision-making. In addition, it will also serve the purpose of disseminating statistical data for national, regional and international purposes.

Free and Open Source Software (FOSS)

These are software made available free of cost. In the Jamaican context, this refers to those open source applications with reasonable support and governance structure to ensure that the use of the software can be sustained within the education system.

ICT

The term, "Information and Communication Technologies (ICT) refers to forms of technologies that are used to create, store, share or transmit, exchange information" (Blurton, 1999, p. 1). This broad definition of ICT includes technologies such as radio,

television, video, DVD, telephone (both fixed line and mobile phones), satellite systems, computer and network hardware and software, as well as the equipment and services associated with these technologies, such as video conferencing and electronic mail. In the Jamaican education context, ICTs include all digital and electronic resources, information technology tools and applications, education management systems which are deployed as enablers for effective teaching and learning which ultimately promote creativity and innovation towards achieving a knowledge-based economy.

Life Cycle

This is a structured approach using defined phases to implement ICT initiatives. In this context, each phase is completed before subsequent phases begin. For example, the life cycle approach to system implementation has three phases: 1) Definition; 2) Construction; and 3) Implementation. The output of each phase forms the input to subsequent phases. This is sometimes referred to as the Waterfall Model.

Open Educational Resources (OER)

In this context speaks to electronic and digital teaching and learning materials that are made available for use within the education system.

Open Standards

Service Level Agreement (SLA)

This is a document that outlines the agreed quality of service to be delivered by service provider to a client. An SLA usually forms an overall contract to an agreement and is binding.

Theory of Change (TOC)

This theory defines all the processes that are required to achieve stated long term goals. These processes are usually set out in a change framework as outcomes or results.

Transformation

In the context of this policy, transformation means changes to the teaching and learning processes enabled through the use of ICTs tools.

Vision 2030

The roadmap that defines the goals, strategies and national outcomes required to transform Jamaica to developed status by 2030.

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