Transforming Education through Technology for Inclusive and Sustainable Learning

Ghana EdTech Strategy

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Final

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Abbreviations

MoE   Ministry of Education

GES   Ghana Education Service

MoCD   Ministry of Communications and Digitalization

CENDLOS Centre for National Distance Learning and Open Schooling

NTC   National Teaching Council

CTVET   Commission for Technical and Vocational Education and Training

GTEC   Ghana Tertiary Education Commission

EMIS   Education Management Information System

REA   Renewable Energy Authority

GSA   Ghana Standards Authority

EPA   Environmental Protection Agency

CPD   Continuous Professional Development

CSOs   Civil Society Organizations

NITA   National Information Technology Agency

NCCE   National Commission for Civic Education

DPC   Data Protection Commission

PPP   Public-Private Partnership

CaaS   Computer-Lab-as-a-Service

LMS   Learning Management System

Definition of Terms

Educational Technology (EdTech)	The combined use of computer hardware, software, and educational theory and practice to facilitate learning. It encompasses various domains, including online learning, instructional technology, and information and communication technology (ICT) in education.
Artificial Intelligence (AI)	The simulation of human intelligence processes by machines, especially computer systems. AI can support and enhance teaching roles in education by handling tasks like lesson planning, marking and offering individualized learner support through AI-powered tutors.
Adaptive Learning	An educational method that uses AI to tailor teaching materials and techniques to the individual needs of each learner, thereby enhancing learning efficiency and effectiveness.
Blended Learning	A teaching approach that combines traditional face-to-face classroom methods with online educational materials and interactive online activities.
Learning Management System (LMS)	A software application or web-based technology plan that implements and assesses a specific learning process. Educators can create and deliver content, monitor learner participation, and evaluate learner performance via the LMS.
Massive Open Online Course (MOOC)	A free online course available for anyone to enrol in, providing an affordable and flexible way to learn new skills or advance one's career.
Mobile Learning (m-Learning)	Educational content delivered through mobile devices such as smartphones and tablets, allowing learning to occur anytime and anywhere.
E-Learning	Learning conducted via electronic media, typically on the Internet. It encompasses various forms of educational technology in learning and teaching.
Digital Literacy	The ability to effectively and critically navigate, evaluate, and create information using various digital technologies.
Virtual Learning Environment (VLE)	An online system that provides educators and learners with digital solutions to create, store, and disseminate educational content.
Assistive Technology	Devices or software designed to assist individuals with special needs in performing functions that might otherwise be difficult or impossible.

Cybersecurity	The practice of protecting systems, networks, and programs from digital attacks, ensuring the integrity, confidentiality, and availability of information.
Data Privacy	The aspect of information technology that deals with the ability of an organization or individual to determine what data can be shared with third parties.
Digital Divide	The gap between those who have ready access to computers and the Internet and those who do not due to socioeconomic or geographical factors.
Personalized Learning	An educational approach that aims to customize learning for each learner's strengths, needs, skills, and interests, often leveraging technology to facilitate individualized learning paths.
Educational Management Information System (EMIS)	A system for collecting, integrating, processing, maintaining, and disseminating data and information to support decision-making, policy analysis, formulation, planning, monitoring, and management at all levels of an education system.
Inclusive Curriculum	A curriculum that ensures the participation and achievement of all learners, regardless of their backgrounds, abilities, or special needs, by providing equitable access to learning opportunities.
Out-of-School Children (OOSC)	Children and young people in the official age range for a given level of education who are not enrolled in pre-primary, primary, secondary, or higher levels of education.
EdTech Ecosystem	The network of stakeholders, including educators, learners, policymakers, technology providers, and communities, that interact and collaborate to integrate technology into education effectively.
Digital Pedagogy	The study and use of contemporary digital technologies in teaching and learning focusing on how to effectively integrate digital tools to enhance educational outcomes.
VARK	Visual, Aural, Reading, Kinesthetic. The four (4) main types of learning styles or preferences that people have when acquiring new information
Mobile Network Operators	Mobile Network Operators (MTN, Telecel, Airtel Tigo, Glo Ghana, GIFEC, NITA, Internet Service Providers (ISPs))
Workplace Experience Learning	Workplace Experience Learning

Executive Summary

The Ghana EdTech Strategy presents a comprehensive national framework designed to leverage digital technologies to deliver inclusive, equitable, and high-quality education. By focusing on 14 strategic priority areas, the strategy seeks to systematically address foundational gaps while positioning Ghana as a leader in digitally enabled learning across Africa.

This strategy is grounded in a robust framework of *Governance*, *Management, and Administration* to ensure leadership, accountability, and coordination across various sectors and stakeholder groups. This is strengthened by substantial investments in *Infrastructure and Connectivity* aimed at closing the digital access gaps, especially in underserved and rural areas. Prioritising *Localised Content Creation* ensures that teaching and learning resources align with Ghana's cultural, linguistic, and contextual realities. *Curriculum and ICT Integration* incorporate digital skills across educational levels to promote 21st-century learning. Through targeted *Capacity Building* interventions, including training and support, teachers, school leaders, and system administrators can be empowered to effectively utilise and maintain digital tools. *Inclusivity and Accessibility* guarantee equitable access to EdTech solutions for all learners, including girls, children with disabilities, and marginalised communities. This strategy prioritises *Cybersecurity and Digital Safety* along with *Data Protection* to establish a secure and trustworthy digital learning environment. Complementing this is the creation of secure, interoperable systems for *Data Management and Reporting*, which will underpin real-time decision-making and provide insights at the school level. A strategic focus on *Monitoring and Evaluation* provides the necessary feedback loop to refine programs and enhance their implementation. Additionally, this strategy advocates AI and Emerging Technologies to improve learning outcomes, support teacher planning, and facilitate personalised learning experiences.

Incorporating *Experiential Learning and Innovations* facilitates the creation of creative, hands-on learning experiences through makerspaces, coding, robotics, and real-world problem-solving. At the heart of this strategy is a dedication to *Sustainable and Financially Inclusive Digital Learning Systems*, achieved through the development of innovative financing models, public-private partnerships, and resource optimisation frameworks. Together, these 14 strategic priorities were designed to ensure that Ghana's education system is future-ready, resilient, and responsive to all citizens learning needs.

Introduction

1.1. Rationale for the EdTech Strategy

The Fourth Industrial Revolution (4IR) has brought rapid advancements in Artificial Intelligence (AI), Big Data, Cloud Computing, and Digital Learning Platforms, reshaping education globally. The shift toward digital transformation has highlighted the critical role of Educational Technology (EdTech) in reshaping teaching, learning, assessment, research, and educational administration. For Ghana, adopting EdTech is not just a response to global trends; it is a strategic imperative to improve access, equity, quality, and relevance in the education system. Hence, integrating EdTech and AI-driven innovations has the potential to bridge educational gaps, improve learning outcomes, and ensure equitable access to quality education in the future.

While progress has been made in expanding access to basic education, challenges persist, including the following:

   i. Limited digital infrastructure
   ii. inconsistent connectivity across schools
   iii. Low digital literacy among teachers and learners
   iv. Limited localized digital content
   v. Inequitable access to learning resources, especially in underserved areas

AI-powered personalised learning, automated administrative processes, and real-time data analytics offer solutions to address these challenges, making education adaptive, efficient, and inclusive. This EdTech Strategy provides a framework to strengthen foundational systems and gradually build the capacity to leverage digital tools for teaching, learning, assessment, school management, research, and policy development. While advanced technologies such as Artificial Intelligence (AI) provide long-term potential, the strategy focuses on building the necessary infrastructure, institutional capacity, content, and training systems to lay the groundwork for future innovation is very much deficient.

The EdTech strategy seeks to:

   i. Ensure the provisioning and setup of the needed technological infrastructure and digital systems for teaching, learning, assessment, research, and educational administration
   ii. Improve learner learning experiences through appropriate, accessible digital content
   iii. Enhance teacher capacity through training, support systems, and digital teaching resources
   iv. Expand access to education through inclusive, multi-platform digital solutions and assistive technologies
   v. Strengthen education system management using data systems for planning, monitoring, and improved decision making
   vi. Ensure safe, secure, efficient, stable, and equitable digital learning environments

Ghana, like many African countries, has a complex education system. The EdTech Strategy development followed a thematic approach to ensure that decision-makers and implementers of the strategy understood the interaction between categories, enabling a structured implementation plan that considered interconnected components within the education system.

This EdTech strategy aligns with the following:

i. Ghana's Education Strategic Plan (ESP) 2018-2030
ii. ICT in Education Policy (2015, 2024 (revised))
iii. The World Bank's EdTech Readiness Index (ETRI), 2023
iv. Sustainable Development Goal 4 (Quality Education)
v. AU Agenda 2063 and ECOWAS ICT in Education Framework (2018)
vi. EdTech Hub – Developing a National EdTech Strategy (Global Reference), 2022
vii. Cybersecurity ACT 2020 (1038)
viii. Data Protection ACT 2012 (ACT 843)
ix. National Child Online Protection Framework 2024
x. National Cybersecurity Policy and Strategy 2024
xi. Electronic Transactions ACT 2008 (ACT 772)
xii. Directive for the Protection of Critical Information Infrastructure

1.2. Purpose

The Ghana EdTech Strategy provides a structured framework for integrating, implementing, and sustaining technology and AI in education in Ghana. It guides policymakers, educators, technology providers, and development partners in designing and deploying scalable and efficient evidence-based EdTech solutions. The Ghana EdTech Strategy aims to provide a structured, inclusive, and sustainable framework for the integration of digital technology into the national education system. It is intended to guide policymakers, educators, technologists, and development partners in the following ways:

i. Provisioning and setup of the needed technological infrastructure and digital systems for teaching, learning, assessment, research, and educational administration
ii. Strengthening the digital foundations of Ghana's education system
iii. Expanding access to high-quality and relevant educational content
iv. Supporting educators through continuous professional development in EdTech through automated lesson planning and intelligent tutoring
v. Enhancing education system management through improved data systems for real-time decision-making
vi. Promoting digital equity and inclusion for learners in all regions and communities
Build a future-ready workforce by embedding AI, coding, and computational thinking into the curriculum.

1.3. Vision

A digitally inclusive and resilient education system in Ghana that enhances learning, teaching, and management through accessible, relevant, and sustainable educational technology solutions.

1.4. Mission

To guide the integration of digital technology into Ghana's education system by strengthening foundational systems, expanding equitable access, empowering educators and learners, and promoting innovation, ensuring that every learner is equipped with the skills to thrive in a digital world.

1.5 Goal

The overarching goal of this strategy is to establish a coherent, inclusive, and sustainable framework that guides the integration of digital technology across all levels of Ghana's education system, ensuring that learners, teachers, and institutions are empowered with the tools, skills, and support systems required to thrive in an increasingly digital world. It seeks to bridge the digital divide, enhance teaching and learning outcomes, and lay the foundational systems, infrastructure, capacity, content, governance, and monitoring that will enable Ghana to adapt to future innovations, including emerging technologies, in a phased and contextually relevant manner.

1.6. Objectives

The following objectives drive the Ghana EdTech Strategy:

i. *Governance and Coordination*: Establish clear roles, policies, and structures to lead EdTech implementation.
ii. *Connectivity and Infrastructure*: Expand ICT infrastructure and affordable Internet access in schools.
iii. *Content Development:* Support the creation of localised, curriculum-aligned digital learning materials.
iv. *Capacity Building:* Train teachers, administrators, learners, and policymakers in digital literacy and pedagogy.
v. *Curriculum Integration:* Integrate digital skills, computational thinking, and emerging technologies into learning outcomes.
vi. *Equity and Inclusion*: Ensure that all learners—including those with special education needs and in rural, urban, and underserved areas —can access digital learning.
vii. *Cybersecurity and Data Protection:* Protect learner and school data and promote responsible digital citizenship.
viii. *Monitoring and Evaluation:* Use data systems to track EdTech adoption, usage, and learning impact.
ix. *Partnerships and Sustainability:* Foster collaboration across public, private, and development sectors to fund and scale solutions.
x. *Readiness for Emerging Technologies:* Build long-term capacity to explore and adopt technologies such as AI in the future.

1.7. Scope

The Ghana EdTech Strategy applies to all levels of education and key stakeholders, including:

1.7.1. Education Levels Covered
i. Early Childhood, Primary, and Junior High School (Basic Level)
ii. Secondary Education
iii. Technical and Vocational Education and Training (TVET)
iv. Tertiary and Continuing Education
v. Informal and Alternative Learning Systems

1.7.2. Stakeholders Engaged

i. Ministry of Education (MoE), Ghana Education Service (GES), and regulatory bodies
ii. Regional and District Education Offices
iii. Teachers, school administrators, and ICT coordinators
iv. learners, parents, and community leaders
v. Tech startups, AI innovators, and digital content creators
vi. Development partners (World Bank, UNICEF, UNESCO, African Union, ECOWAS, etc.)

1.7.3. Areas of Focus

i. Digital governance, budgeting, and institutional leadership
ii. School-level digital infrastructure and connectivity
iii. Digital literacy, teacher training, and professional development
iv. Curriculum-aligned digital content and delivery platforms
v. Inclusive access, assistive technologies and support for learners with special needs
vi. Data systems for management and performance tracking
vii. Cybersecurity and learner data protection measures
viii. AI-enhanced smart classrooms and digital platforms

1.8. Guiding Principles

The Ghana EdTech Strategy is grounded in the following core principles:

i. *Equity and Inclusion*: Ensure all learners have access to digital learning regardless of location, gender, abilities, or socioeconomic status
ii. *Sustainability*: Design scalable, cost-effective, and context-appropriate solutions
iii. *Collaboration and Partnerships*: Encourage multisectoral (e.g., government, academia and private sector) collaboration and partnerships for innovation and funding
iv. *Phased Innovation:* Emphasize incremental implementation of emerging technologies based on readiness
v. *Capacity Development:* Build the digital and pedagogical capacity of educators and education managers
vi. *Resilience and Flexibility*: Promote hybrid, blended, and offline solutions to meet local realities
vii. *Localization*: Prioritize Ghanaian languages, culture, and curriculum alignment in EdTech solutions
viii. *Safety and Security:* Safeguard learner data and promote safe digital behaviours
ix. *Evidence-Based Implementation*: Use data and research to inform planning, implementation, and continuous improvement
x. *Future Readiness*: Build digital foundations today that can support emerging technologies tomorrow
xi. *Ethical AI Use in Education*: Establishing AI ethics guidelines to ensure fairness, transparency, and bias reduction in learning technologies.
xii. *Data-Driven Decision-Making*: Using AI-powered analytics to assess educational performance, resource allocation, and policy effectiveness.

THE FOURTEEN (14) THEMATIC AREAS

Thematic Area 1: Governance

2.1. Vision

Establish a robust, transparent, and coordinated governance structure to oversee the integration of EdTech into Ghana's education system, ensuring ownership, accountability, and sustainable implementation.

2.2. Objectives

Number	Objectives
1	Develop a centralized governance framework to coordinate EdTech strategy.
2	Strengthen government, private sector, and academia collaboration for EdTech Strategy implementation.
3	Ensure a holistic capacity building and professional development for educators and administrators on how to integrate and govern EdTech effectively.
4	Maintain a coordinated and distributed system of governance (Collaborating Approach) framework to coordinate EdTech strategy.
5	Ensure effective and efficient resource utilization for EdTech Initiatives
6	Ensure ownership, Accountability, Transparency, and Equity of EdTech Strategy.

2.3. Challenges and Opportunities

Category	Description	Impact/Significance
Challenges		
1	Non-existence regulatory framework for EdTech adoption and implementation.	Delayed execution and fragmented adoption.
2	Insufficient ~~of~~ sustainable funding	Delayed implementing the strategy
3	Rapid Technological change and adaptability issue	Slow integration of EdTech and changes in the direction of implementation
4	Unwillingness of continuity of EdTech Interventions/initiatives by new administration/management.	Reprioritize policies disruption of educational programs leading to loss of effective initiatives and changes in resource allocation
5	Cybersecurity and data protection risk	Increased vulnerability to data breaches and cyberattacks

6	Non-existence framework for EdTech adoption for persons with special needs	Poor inclusivity and availability of appropriate technologies for persons with special needs
Opportunities		
1	Leveraging public-private partnerships to enhance EdTech governance.	Ensures long-term sustainability of EdTech initiatives.
2	Encourages lifelong learning and professional development	Improve management, teacher and learner effectiveness to ensure that technology integration is meaningful
3	Enhanced data-driven decision making	Better-informed decision-making based on real-time educational data
4	Strengthening digital equity and inclusion	Bridge the digital divide and promote inclusive education

2.4. Establishment of a National EdTech Governance Framework

2.4.1 Governance Structure

A robust governance framework is essential for the successful implementation of EdTech. This includes establishing a National EdTech Steering Committee and a National EdTech Technical Working Group to be coordinated by CENDLOS to oversee the implementation of the EdTech Strategy. The Technical Working Group will report to the Steering Committee. The framework must be standardised and include compliance mechanisms for digital content, platforms, and tools to ensure quality and accessibility. This structure should involve the Ministry of Education, Ghana Education Service, Pre-tertiary, PBMED, Head of ICT Unit - GES, NASIA, CEA, NaCCA, NTC, CTVET, Ghana TVET Service, Private Sector (Telcos, NGOs in EdTech, Service Providers), New Frontier Tech, and other relevant agencies.

2.4.2 Funding and Resources

There is a need to secure adequate and sustainable funding and resources for the sustainability of EdTech initiatives. This can be achieved by ensuring that a significant portion of the education budget is dedicated to EdTech, exploring collaboration with private sector partners to leverage additional resources and expertise, and seeking support from international organisations and development partners.

2.4.3 Monitoring and Evaluation

Establishing a robust monitoring and evaluation framework to track progress and its impact is critical. This will define clear metrics for measuring the effectiveness of EdTech initiatives. Additionally, it will create channels for feedback from management, educators, teachers, learners, parents, and other relevant stakeholders to continuously improve the system and regularly publish reports to maintain transparency and accountability.

2.5. Roles and Responsibilities of Government, Private Sector, and Civil Society

2.5.1 Government

Role: The government serves as the primary regulator, policymaker, and enabler of the adoption and implementation of EdTech.

Responsibilities
  i.   *Policy and Regulation:* Develops laws, policies, and standards for EdTech integration, ensuring accessibility, quality, and data security.
  ii.   *Infrastructure Development*: Invests in digital infrastructure, such as offline and online learning management systems, devices, and affordable Internet connectivity, particularly for underserved communities.
  iii. *Funding:* Provides funding and incentives for EdTech adoption in schools and educational institutions.
  iv.   *Capacity Building:* Provide capacity for management and educators in digital literacy programs to improve the adoption of EdTech.
  v.   *Monitoring and Evaluation:* Establish mechanisms to assess the impact of EdTech adoption and ensure compliance with regulations.
  vi.   *Equity and Inclusion:* Ensure EdTech solutions cater to diverse learning needs, especially for learners with special needs and those in underserved communities.

2.5.2 Private Sector

Role: The private sector (EdTech companies, technology providers, and investors) drives innovation, product development, and service delivery in education.
Responsibilities:
  i.   *Technology Development:* Designs and develops digital learning tools, platforms and software.
  ii.   *Public-Private Partnerships (PPPs):* Collaborate with governments and institutions to expand EdTech access (including the provision of affordable data).
  iii. *Research & Innovation:* Invest in research and development to enhance digital education through AI, VR, gamification, and adaptive learning.
  iv.   *Data Privacy & Security:* Ensures ethical data collection and compliance with global and local regulations.
  v.   *Capacity Building & Training:* Provides training programs for school managers, educators, and learners on how to use EdTech solutions effectively.

2.5.3 Civil Society (NGOs and Advocacy Groups)

Role: Civil society acts as a watchdog, advocate, and facilitator to promote ethical, inclusive, and evidence-based governance in EdTech.
Responsibilities:
  i. *Advocacy and Awareness:* Create awareness of digital literacy and equitable access to EdTech adoption among underserved communities.
  ii. *Policy Advisory and Research:* Conducts independent research on the effectiveness of EdTech and provides policy recommendations.
  iii. *Capacity Building and Community Engagement:* Conduct digital literacy and teacher-training programs, particularly in underserved areas.
  iv. *Monitoring and Accountability:* Holds governments and private sector players accountable for ethical and responsible EdTech practices.
  v. *Open Educational Resources (OER):* Develops and promotes free educational content to enhance accessibility.

2.6. Strategy and Legal Framework for EdTech Implementation

2.6.1 Strategy Objectives

This strategy will help ensure equitable access to digital learning tools and resources for all learners, regardless of their socioeconomic background. It will enhance the quality of education using technology by focusing on interactive and personalised learning experiences. EdTech solutions must be inclusive and cater to the needs of learners with special needs.

2.6.2 Legal Framework

A robust legal framework to establish regulations to protect learner and teacher data, ensuring compliance with international standards, such as the GDPR. Protect the intellectual property of EdTech developers and content creators. Set standards for digital educational content to ensure it meets national curriculum requirements and quality benchmarks

2.6.3 Governance Structure

The governance structure should include the Ministry of Education, EdTech Advisory Board, and Implementing Agencies, and beneficiary schools and institutions.

2.6.4 Funding and Resources

Secure funding through Government Budget Allocation, Public-Private Partnerships, and development partnerships.

2.6.5 Monitoring and Evaluation

Establish a monitoring and evaluation framework to track progress and its impact.

2.7 National Coordination and Partnerships

2.7.1 Centralized Policy Framework

i.   Establish national EdTech strategies that align with broader educational goals.
ii. Ensure consistency in policies across regions and educational institutions.

2.7.2 Regulatory Oversight and Standards

i.   Develop national guidelines for the use of EdTech tools, ensuring quality, accessibility, and data privacy.
ii. Monitor the effectiveness of digital education initiatives through standardized assessments.

2.7.3 Infrastructure Development

i.   Coordinate investments in digital infrastructure (broadband access, school devices, and IT support).
ii. Ensure that EdTech solutions reach urban and rural schools equitably.

2.7.4 Capacity Building and Training

i.   Oversee the implementation of nationwide teacher-training programs in digital pedagogy.
ii. Ensure the development of digital literacy programs for learners, parents, and school administrators.

2.7.5 Funding and Resource Allocation

Allocate financial and technical resources to support EdTech adoption in schools, educational institutions and communities (community libraries)

2.8 Partnerships in EdTech Governance

2.8.1   Public-Private Partnerships - PPPs

i.   Government collaborates with EdTech companies to provide free or subsidised learning platforms (e.g. Google for Education and Microsoft Teams for schools).
ii. Telecom providers offer discounted or free Internet access to learners and educators.
iii. Corporate social responsibility (CSR) programs fund digital literacy training.

2.8.2 Government-Civil Society Partnerships

i.   NGOs and advocacy groups help bridge the digital divide by providing free educational resources and training.
ii. Civil society organisations monitor the ethical use of learner data and privacy policies.
iii. Community-based organisations assist in the adoption of EdTech in marginalised areas.

2.8.2 Government-Academic Partnerships

i.   Universities conduct studies on the impact of EdTech and recommend the best practices.
ii. Collaboration with research institutions can help develop AI-driven personalised learning tools.

iii. Governments fund educational technology research and pilot programs in universities.

2.8.4 International Partnerships and Development Agencies

i. International EdTech initiatives (e.g. UNICEF's Learning Passport) offers free digital learning content to learners in developing countries.
ii. Cross-border collaborations enable knowledge exchange among countries with advanced EdTech ecosystems.

2.9 Key Actions and Strategies

Action/Strategy	Expected Outcome
Establish a national EdTech governance body.	Clear leadership and accountability for EdTech initiatives.
Develop plan for private sector involvement.	Policy framework for private sector involvement
Funding and Partnership	Sustained funding and increased collaboration in EdTech.
Align Comprehensive EdTech Strategy with the National Medium Term Policy Framework.	EdTech strategy for implementation developed
Provision of ICT infrastructure and logistics	Adequate infrastructure and logistics to support EdTech

2.10 Action Plan

Action	Timeline	Resources Needed	Responsible
EdTech Strategy developed	End of June, 2025	Financial, Logistics and Human resources	MoE, GES, CTVET, Ghana TVET Service, CENDLOS, World Bank, CEA, DPs
Establish National EdTech Steering Committee	End of June, 2025	Financial, Logistics and Human resources	MoE, GES, CTVET, Ghana TVET Service, CENDLOS, World Bank, CEA, DPs
Establish National EdTech Technical Working Group	End of July, 2025	Financial, Logistics and Human resources	MoE, GES, CTVET, Ghana TVET Service, CENDLOS, World Bank, CEA, DPs
Develop ToRs for the SC and TWG	End of August, 2025	Logistics and Human resources	MoE, GES, CEA, DPs

			CENDLOS, World Bank
Develop plan for private sector involvement.	End of August, 2025	Financial, Logistics and Human resources	MoE, GES, CEA, CTVET, Ghana TVET Service, DPs CENDLOS, World Bank
Identify EdTech funders	End of August, 2025	Financial, Logistics and Human resources	MoE, GES, CEA, CTVET, Ghana TVET Service, DPs CENDLOS, World Bank
Develop Implementation Partnership Agreements for funding	End of September, 2025	Financial, Logistics and Human resources	MoE, GES, CEA, CTVET, Ghana TVET Service, DPs CENDLOS, World Bank
Develop a comprehensive EdTech Plan aligned with the National Policy	End of August, 2025	Financial, Logistics and Human resources	MoE, GES, CEA, CTVET, Ghana TVET Service, DPs CENDLOS, World Bank
Provide ICT Infrastructure, Content and Logistics for EdTech	2025 - 2030	Financial and Human (Incl. Budget officers, Finance officer, Procurement officer, Audit at the planning and implementation stages) resources	MoE, GES, CEA, CTVET, Ghana TVET Service, DPs CENDLOS, World Bank

2.11 Performance Indicators

Indicator	Description	Target	Data Source	Frequency
Completion of a documented private sector engagement plan.	A finalized and approved plan outlining strategies, stakeholders, and implementation steps for private sector involvement.	Number of Private sector players in EdTech involved	Research publications/ Existing private sector engagement plans	Once
Number of signed Implementation Partnership Agreements (IPAs).	The total count of formal agreements signed with funding partners to support implementation.	Number of signed Implementation Partnership Agreements (IPAs) to secure funding for implementation. (e.g: At least 5 signed IPAs by Q4 2025 to support project implementation).	Research publications/ existing IPAs	Once
Completion and official approval of the EdTech Strategy.	A finalized and government-endorsed EdTech plan that aligns with the National Policy.	A fully developed and government-approved EdTech Plan 1. At least 5 stakeholder consultation sessions conducted with policymakers, educators, and EdTech providers. 100% alignment with key National Policy priorities as assessed through a policy compliance review.	Research publications/Existing EdTech plans	Once

		Incorporation of at least 80% of recommended EdTech strategies from national and international best practices.		
		Adoption by at least 80% of key education stakeholders (e.g., Ministry of Education, school districts, EdTech partners).		
		Development of an implementation roadmap with at least 3 clear milestones for rollout.		
Percentage of schools and learning centers equipped with ICT infrastructure.	Schools equipped with	Target: At least 80% of schools and learning centers equipped with ICT infrastructure by 2028 year.	EMIS Data	Annual Census
	(e.g., computers, internet connectivity, digital devices).			

2.12 Risk Assessment

Risk	Impact	Likelihood	Mitigation Strategy
Data privacy and cybersecurity regulation gaps	Risk of Learners' data breaches and misuse	High	Align national laws with global standards (e.g., GDPR), to ensure compliance audits
Limited internet connectivity in rural areas	Exclusion of learners in underserved areas widening the digital divide	High	Expand broadband projects to underserved areas, partner with telcos providers for subsidies
Insufficient IT infrastructure (e.g.,	Inequitable access to digital learning tools	Medium	Implement device-sharing programs, encourage private sector donations

computers, tablets, servers)			
Technical Failures	Inability to access digital tools and platforms	Medium	Ensure regular maintenance and updates of hardware and software. Establish a reliable IT support system with real time responses.
Inadequate training opportunities for educators	Inability to effectively leverage digital tools	High	Develop comprehensive training programs tailored to educators needs. Provide continuous professional development opportunities.

2.13 Roles and Responsibilities

MDAs	Responsibility	Expected Contribution
Ministry of Education (MoE)	Review the 2015 ICT in Education policy.	Ensures policy alignment with Ghana's education goals, provides funding, and oversees implementation of EdTech Strategy
Ghana Education Service (GES)	Implements EdTech Strategy in schools.	Ensure schools integrate digital tools, monitors usage and effectiveness
Technical and Vocational Education and Training (TVET) Institutions	Implements EdTech Strategy in TVET institutions.	Ensure workforce readiness for the digital economy. Digital skills training programs developed for the youth
Complementary Education Agency (CEA)	Implements EdTech Strategy in classes and training Centers	Ensure the integration of digital tools in Classes and Learning Centers and monitors usage and effectiveness
Ministry of Communications and Digitalization	Leads ICT development and broadband expansion	Ensures connectivity for schools and learning centers, supports digital inclusion initiatives

Internet Service Providers (ISPs) and Telcos	Provide internet access and digital infrastructure	Expand affordable and reliable internet connectivity to schools and remote areas
Universities and Colleges of Education.	Develop and implement curricula that incorporate digital literacy and EdTech use	Ensure educators are equipped to integrate technology in teaching and learning
World Bank, UNICEF, UNESCO, USAID and other DPs	Provides funding and technical support for EdTech interventions/initiatives	Assist Ghana in implementing large-scale digital education programs
Data Protection Commission (DPC)	Enforces data privacy laws for EdTech platforms and institutions	Protects learner and teacher data, enforces cybersecurity regulations

2.14 Alignment with Other Pillars

   i.   Supports Data Protection by enforcing cybersecurity laws.
  ii.   Enables Management and Administration through structured governance.
 iii.   Strengthens coordination among government agencies, private sector, and NGOs
 iv.   Ensure the implementation of strategies to expand ICT infrastructure in schools
  v.   Ensures affordable and reliable Internet access for learners and teachers.
 vi.   Ensure the implementation of policies for digital literacy training.
vii.   Ensures that digital content aligns with the national curriculum.

Thematic Area 2: Management and Administration

3.1 Vision

Strengthen administrative and management systems to efficiently coordinate and support the implementation of EdTech initiatives in educational institutions.

3.2 Objectives

Number	Objectives
1	Implement a digital management system for tracking EdTech initiatives/interventions.
2	Train school managers and educators in digital tools for education governance.
3	Improve access to quality EdTech initiatives/interventions at all levels
4	Ensure sustainable investment in EdTech initiatives/interventions
5	Ensure all learners, regardless of background, benefit from EdTech
6	Ensure provision of infrastructure and digital tools at all levels

3.3 Challenges and Opportunities

Category	Description	Impact/Significance
Challenges		
1	Resistance to adopting digital management tools.	Limits efficiency in decision-making.
2	Unsustainable funding and resources to support EdTech initiatives	Delayed implementation of EdTech initiatives.
3	Cybersecurity and Data Privacy risk	Increase in vulnerability to data breaches and cyberattacks
4	Unavailable Standardized Monitoring and Evaluation Metrics	Measuring the effectiveness of EdTech programs remains inconsistent
5	Deployment of EdTech without Pedagogical Alignment.	Weak engagement and widening learning gaps
6	Unstable network connectivity	Delay in timely feedback and implementation of interventions
Opportunities		
1	Digitalizing Management and administration processes reduce workload, enhance efficiency and transparency.	Ensures efficient resource allocation and effective management and administrative processes.
2	Leveraging technology ensures uniformed content availability, flexibility and consistency in learning.	Ensures equity and improve learning experience.

3.4. Institutional Capacity for Managing EdTech

3.4.1 Infrastructure
i. Digital Connectivity: Ensure the provision of reliable Internet access in all schools and offices, especially in rural and underserved areas.
ii. Digital Devices: Ensure the provision of digital devices for school managers, educators, and learners, such as tablets, laptops, and interactive whiteboards.

3.4.2 Human Resources
i. Professional Development: Implement continuous professional development programs for school managers and educators to enhance their skills in using EdTech tools effectively.
ii. Certification Programs: Develop certification programs for educators in digital learning and technology management.
iii. Leadership Training: Provide training for school managers, and educators on strategic planning and management of EdTech initiatives.

3.4.3 Governance Structures
i. *EdTech Advisory Board:* Form an advisory board comprising experts from academia, industry, development partners, learner representatives, and civil society to provide strategic guidance and oversight.
ii. *Local Education Authorities:* Empower local education authorities to implement and monitor the EdTech Strategy at the regional and local levels.

3.4.4 Collaborations and Partnerships
i. *Public-Private Partnerships (PPPs):* Collaborate with private sector partners to leverage additional resources, expertise, and innovative solutions.
ii. *Development partners and donors:* seek support from CSOs, faith-based organisations, industries, international organisations, parents, and local donors to fund EDtech initiatives.

3.4.5 Monitoring and Evaluation
i. *Performance Metrics:* Define clear metrics to measure the effectiveness and efficiency of EdTech initiatives and capacity-building programs.
ii. *Feedback Mechanisms*: Establish channels for feedback from school managers, educators, learners, parents, funders, and CSOs to continuously improve EdTech interventions/initiatives.
iii. *Regular Reporting:* Ensure regular reporting and linking indicators to maintain transparency and accountability.

3.4.6 Inclusivity and Accessibility
i. *Special Needs Education:* Ensure that EDtech initiatives/interventions are accessible to education managers, educators, and learners with special needs.
ii. *Gender Equity*: Promote gender equity in EdTech adoption and implementation.

3.5. Leadership and Decision-Making Structures
3.5.1 Central Leadership

i. *Ministry of Education (MoE):* The MoE should lead all EdTech initiatives and ensure alignment with the national education policies and goals.
ii. *MoE agencies and other stakeholders*: Responsible for implementing EdTech Strategies and managing day-to-day operations.

3.5.2 EdTech Advisory Board

i. *Composition*: Include experts from academia, industry, development partners, learner representatives, civil society, and the government.
ii. *Roles*: Provide strategic guidance and advice on policy development, technology integration, and best practices.

3.5.3 Local Education Authorities

i. *Regional and District Offices:* Empower local education authorities to implement and monitor the EdTech Strategy at the regional and local levels.
ii. *School Leadership:* School heads and administrators should be trained to manage effectively EDTech initiatives.

3.5.4 Stakeholder Engagement

i. *School managers and Educators:* Involve school managers and educators in decision-making processes to ensure that EdTech tools meet their needs and enhance teaching and learning practices.
ii. *Learners and Parents:* Create channels for feedback from learners and parents to continuously improve EdTech initiatives/interventions.

3.5.6 Public-Private Partnerships (PPPs)

i. *Collaboration*: Partner with private sector companies to leverage additional resources, expertise, and innovative solutions.
ii. *Funding*: Secure funding through collaborations with industry, CSOs, international organisations, and donors.
iii. *EdTech Accelerators:* Collaborate with programs such as the Mastercard Foundation EdTech Fellowship to support startups and SMEs in the EdTech space.

3.5.7 Government Funding

i. *Budget Allocation:* Ensure that a significant portion of the national education budget is dedicated to EdTech initiatives.
ii. *Ghana Education Trust Fund (GETFund):* Leverage GETFund to support infrastructure development, digital devices, and teacher training programs.

3.5.8 International Grants

i. *Multilateral Organisations*: Seek funding from organisations such as the World Bank, UNESCO, the Mastercard Foundation, and UNICEF for large-scale EdTech initiatives/interventions.

ii. *Bilateral Aid:* Engaging with donor countries and international development agencies to secure grants and technical assistance.

3.5.9 Community and Local Resources

i. *Local Fundraising:* Organising fundraising events and campaigns to gather additional resources from the community.

ii. *Community Partnerships:* Mobilise resources from local businesses, parent associations, and community leaders to support EdTech initiatives.

3.5.10 Innovative Financing Mechanisms

Impact Investing: Attract impact investors interested in funding projects that generate social and educational benefits.

3.6 Key Actions and Strategies

Action/Strategy	Expected Outcome
Deploy a nationwide school management system.	Real-time monitoring of school performance.
Provide continuous professional development programs for education managers and educators.	Increased digital literacy among education managers and educators
Improve access to quality EdTech interventions at all levels	Improved access to quality EdTech at all levels
Develop sustainable investment plan-for EdTech initiatives	Enhance skills of key actors in Edtech at all levels
Ensure all learners, regardless of background, benefit from EdTech initiatives/interventions	Improved access and inclusivity for all learners

3.7 Action Plan

Action	Timeline	Resources Needed	Responsible
Deploy a nationwide school management system.	2025 -2030	Financial, Logistics and Human resources	MoE, GES, CTVET, Ghana TVET Service, CENDLOS, World Bank, CEA, DPs
Provide continuous professional development programs for education managers and educators	End of December, 2025	Financial, Logistics and Human resources	MoE, GES, CTVET, Ghana TVET Service, CENDLOS, World Bank, CEA, DPs
Improve access to quality EdTech interventions at all levels	2025 - 2030	Financial, Logistics and Human resources	MoE, GES, CTVET, Ghana TVET Service, CENDLOS, World Bank, CEA, DPs
Develop sustainable investment plan in EdTech initiatives	End of June, 2025	Financial, Logistics and Human resources	MoE, GES, CTVET, Ghana TVET Service, CENDLOS, World Bank, CEA, DPs
Ensure all learners, regardless of background, benefit from EdTech	2030	Financial, Logistics and Human resources	MoE, GES, CTVET, Ghana TVET Service, CENDLOS, World Bank, CEA, DPs

3.8 Performance Indicators

Indicator	Target	Data Source	Frequency
% of schools and learning centres with reliable internet access	All Schools and learning centres	Government reports	Biannually
Number of educators and learners with access to digital devices	All educators and learners	Government reports	Biannually
% of managers and educators who have completed EdTech training programs	All educators and learners	Government reports	Biannually
% of educators and learners demonstrating proficiency in digital literacy skills	All educators and learners	Government reports	Biannually
% of digital content that aligns with the national curriculum	All curricula	Government reports	Biannually

% of EdTech interventions accessible to education managers, educators and learners with special needs	All education mangers, educators and Learners	Government reports	Biannually
% of educators and satisfied with EdTech tools and training	All educators and learners	Government reports	Biannually
Establishment of clear metrics to measure the effectiveness of EdTech initiatives	All stakeholders	Frequency of reports published on the progress and impact of EdTech initiatives	Biannually

3.9 Risk Assessment

Risk	Impact	Likelihood	Mitigation Strategy
Non-availability and unreliable internet connectivity and intermittent or unsustainable power supply, especially in rural areas	High	Likely	Invest in reliable internet connectivity and power supply solutions
Unauthorized access to sensitive data of users	Medium	Likely	Implement robust cybersecurity protocols, including regular audits and training
Resistance from education managers and educators-to adopt new technologies	Medium	Likely	Provide continuous training and support for educators and administrators
Insufficient training for education managers and educators on using EdTech tools	Medium	Likely	Provide continuous training and support for educators and administrators
Lack of protection of intellectual property rights for EdTech content and tools	Medium	Likely	Ensure adherence to data privacy and intellectual property regulations
Inadequate funding for EdTech initiatives	High	Likely	Explore multiple funding mechanism for EdTech initiatives

3.10 Roles and Responsibilities

Role	Responsibility	Expected Contribution
Ministry of Education (MoE)	Review the 2015 ICT in Education policy and allocate resources to the implementation agencies	Ensures policy alignment with Ghana's education goals, provides funding, and oversees implementation
Ghana Education Service (GES)	Implements EdTech Strategy in schools	Ensures schools integrate digital tools, monitors usage and effectiveness
Ghana TVET Service	Implements EdTech Strategy in TVET schools and training institutions	Ensures TVET schools integrate digital tools, monitors usage and effectiveness
Complementary Education Agency (CEA)	Implements EdTech Strategy in classes and training Centers	Ensures the Agency integrate digital tools in classes, monitors usage and effectiveness
Technical and Vocational Education and Training (TVET) Institutions	Develop digital skills training programs for youth	Ensure workforce readiness for the digital economy
Universities and Colleges of Education	Train educators in digital literacy and EdTech use	Ensure teachers are equipped to integrate technology into teaching and learning.
World Bank, UNICEF, UNESCO, USAID, and Other DPs	Provides funding and technical support for EdTech interventions/initiatives	Assist Ghana in implementing large-scale digital education programs

3.11 Alignment with Other Pillars

i. Links with Data Management Systems to facilitate reporting and accountability.
ii. Supports Infrastructure and Connectivity by ensuring proper resource allocation.
iii. Ensure EDTech Strategy are implemented at national, regional, district, and institutional levels.
iv. Ensures effective coordination between government, private sector, and schools.
   Example: GES ICT Units manage EdTech adoption in schools.
v. Oversees the procurement and maintenance of the EdTech infrastructure.
vi. Ensures that digital content is accessible and aligned with the national curriculum.

Thematic Area 3: Infrastructure and Connectivity

4.1. Vision

Ensure equitable access to digital infrastructure and connectivity to support digital learning and administration in schools. This will improve learning outcomes and create jobs by producing digitally literate graduates.

4.2. Objectives

Number	Objectives
1	Expand reliable internet access to all public schools with dedicated connectivity for pre-tertiary and tertiary institutions.
2	Provide subsidized, low-cost mobile devices and laptops for both learners and teachers at all levels.
3	Make provision for Bring Your Own Device (BYOD) to complement government effort while establishing compliance frameworks.
4	Establish shared ICT centres of excellence and practical labs across schools nationwide.
5	Launch and train a localized technical support team to respond to maintenance issues and establish preventive maintenance protocols by leveraging on expertise from universities and technical universities.
6	Partner with Mobile Network Operators (MNOs) and Internet Service Providers (ISPs) to zero-rate online learning platforms and curriculum-aligned digital content.
7	Provide alternative power sources (solar, battery packs) for off-grid schools.
8	Provide a harmonized interoperability platform for EdTech applications.

4.3. Challenges and Opportunities

Category	Description	Impact/Significance
Challenges		
1	High CAPEX/OPEX for ICT infrastructure.	Limited access for rural and underserved schools.
2	Last-mile connectivity issues (no 4G/5G/fiber/VSat)	Limited access for rural and underserved schools.
3	Security and maintenance bottlenecks	Low lifetime viability for devices
4	Political interference	Stall projects
5	Device durability and cost	Limited access for rural and underserved schools.

6	Inadequate funding	Affects sustainability and rollout
7	Limited capacity in the deployment of existing and emerging technology	Affects sustainability and rollout
Opportunities		
1	Strong demand for PPPs with MNOs and EdTech startups	Reduces costs and increases reach.
2	Global donor demand for digital education (World Bank, GPE, DFID, USAID, AfDB, and other donor partners)	Reduces costs and increases reach.
3	MNOs and ISPs as ecosystem anchors	Reduces costs and increases reach.
4	NITA infrastructure and service availability in all the districts of Ghana	Increase reach and improve connectivity
5	GIFEC's Rural Connectivity Programme	Increase reach and improve connectivity

4.4. Expansion of ICT Infrastructure in Schools

Priority should be given to universities, senior high schools, technical institutes, and basic schools in the Government of Ghana's "Digital Ghana Backbone Initiative". The government should allocate resources to pre-tertiary institutions to establish and enhance ICT infrastructure.

4.5. Affordable Internet Access and Digital Devices for Learners and Teachers

The government should subsidise device procurement and distribution for learners and teachers and promote and support local tech industries in the development and production of digital devices.

Government should provide incentives for MNOs and ISPs to provide affordable data services for campuses.

4.6. Public-Private Partnerships for Connectivity Solutions

The government should partner with the private sector in a PPP arrangement to undertake the following projects:

   i.   Infrastructure (fiber, towers, power, VSAT)
   ii. Content hosting (zero-rating)
   iii. Joint innovation hubs in ICT centre
   iv. PPP enablers referenced in the M&E Framework and the government's "Digital Economy Accelerator" plans.

4.7. Energy and Power Supply for ICT in Education

Government flags energy access as a core bottleneck and

    i.   Provide solar mini-grids for off-grid schools

    ii.   Provide ICT lab with UPS battery backup systems

    iii.   Partner with MNOs and ISPs to deploy solar towers for communities without connectivity

4.8. Key Actions and Strategies

Action/Strategy	Expected Outcome
Develop ICT investment roadmap for the education sector.	Prioritized funding for critical infrastructure.
Develop actionable ICT infrastructure development plan to ensure alignment with government enterprise architecture framework	Improved interoperability and reduced duplication
Provide government-subsidized internet access for schools.	Increased digital inclusion.
Resource NITA/MNOs/ISPs to provide or improve connectivity locally	Reduced connectivity cost and increased digital inclusion
Resource NITA/MNOs/ISPs to provide an interoperability platform for EdTech Applications	Improve coordination and accountability in the EdTech Ecosystem.
Build district-level ICT centres shared across school clusters and collaborate with other partners to leverage and improve on existing Community ICT Centers	Economies of scale, shared resource use
Set up PPP framework with MNOs, ISPs and EdTech companies	Accelerated deployment and innovation

4.9. Action Plan

Action	Timeline	Resources Needed	Responsible
Develop ICT Infrastructure Investment Roadmap aligned to government enterprise architecture	2025-2026	lanning team, IT consultants, telecom experts	CENDLOS and National Information Technology Agency (NITA)
Map and prioritize schools for internet deployment, digital platforms and others. (underserved communities)	2025-2027	GIS data, MNO infrastructure maps, EMIS/NaSIA data, cost models	GES, GTVET, MNOs, NCA, NaSIA
Launch PPP framework with MNOs, ISPs and device providers	2025-2026	Legal MoU templates, subsidy models	MoE, NCA, Ministry of Finance
Develop ICT resource centers across schools.	2025–2029	Computers, internet infrastructure, digital content, and funding for school ICT labs.	GIFEC, CENDLOS, GES, NITA, Telcos
Procure and distribute subsidized devices to SHS/TVET learners and teachers	2026-2030	Device suppliers, logistics vendors, financing mechanisms	MoE, GES, GTVET, GIFEC, GETFund, MNOs
Set up 2500 ICT labs (20-seater computers each)	2025–2030	Civil works, devices, software, solar kits	MoE, District Assemblies, Development Partners
Provide zero-rated access to digital learning platforms	2025-2026	CDN hosting, operator agreements	MoE, MNOs, ISPs, Ministry of Communications
Deploy solar to off-grid schools	2025-2030	Solar kits, maintenance partners	Ministry of Energy, MNOs, NGOs
Train localized technical team, School ICT teachers/Coordinators for maintenance response	2026– 2030	Prevention and Maintenance Training Materials	Tertiary Institutions

4.10 Performance Indicators

Indicator	Target	Data Source	Frequency
% of public schools with internet connectivity	60% by 2030	EMIS, NCA, MoE Reports	Annual
% of teachers receiving ICT devices	90% by 2030	Teacher Distribution Database	Annual
% of functional ICT labs	90% by 2030	MoE project tracking system	Quarterly
% of digital-learning platforms zero-rated by MNOs	100% top 5 platforms by 2026	MoU compliance reports	Quarterly
% of schools with backup power for ICT usage	60% off-grid schools by 2028	Ministry of Energy	Annual
% of teachers trained and certified	60% by 2030	NTC/NaCCA LMS records	Quarterly

4.11 Risk Assessment

Risk	Impact	Likelihood	Mitigation Strategy
Budget shortfalls/delays in fund release	High	Medium	Blend financing with donor and private capital via PPPs and GETFund top-ups
Last-mile connectivity in deep rural areas	High	High	Use of VSAT, microwave, or 4G/5G Fixed Wireless Access (FWA) alternatives
Political change disrupts continuity	High	High	Institutionalize strategy via legislative backing; embed in MTDPs
Device theft and poor maintenance	Medium	High	Use serial tracking, school MoUs, insurance, locked OS for loss prevention, implement routine maintenance protocols
Resistance to change among teachers/admin	Medium	Medium	Early stakeholder sensitization and peer-led digital champions

Power outages or no-grid locations	High	Medium	Integrate solar microgrids or hybrid battery kits in initial deployment

4.12 Roles and Responsibilities

Role	Responsibility	Expected Contribution
MOE	Formulation of policy that supports the integration of digital technology in education.	Policy document and budgetary allocation.
GES/NaSIA/GTEC/TVET	Policy Implementation and monitoring of performance	Regulation, Monitoring and Evaluation
NITA/GIFEC/MNOs/ ISPs	Provide digital infrastructure	Provide Connectivity and Infrastructure.
CENDLOS, National EdTech Steering Committee	Coordination of all stakeholders to align	Facilitate digital learning solutions. To promote digital-learning platforms and resources
Donor Partners	Technical Support	Funding and project support

4.13 Alignment with Other Pillars
  i.   Enhances AI and Emerging Technologies through better infrastructure.
  ii.   Support Inclusivity and Accessibility by providing connectivity solutions for people with special needs.
  iii. Governance pillar to develop policies (PPP framework and compliance framework for the BYOD model).

Thematic Area 4: Localised Content Creation

5.1. Vision

Promote the development and integration of culturally relevant and curriculum-aligned digital content that supports curriculum modernisation, inclusion, and digital learning adoption. This will enhance teaching and learning by improving content adoption and understanding the curriculum.

5.2. Objectives

Number	Objectives
1	Develop local content and local-language digital learning materials.
2	Support EdTech startups in creating educational content.
3	Encourage co-creation of content between teachers, universities, and local creatives.
4	Create open licensing models to ensure free, equitable access to government-funded educational content
5	Ensure content reflects Ghanaian cultural context and social diversity.
6	Establish a national digital repository of localized curriculum-aligned resources.
7	Create content that addresses special needs
8	Develop and enforce Intellectual Property Rights protection for EdTech content creators

5.3. Challenges and Opportunities

Category	Description	Impact/Significance
Challenges		
1	Limited local expertise in content development.	Delays in implementation.
2	Inconsistent quality control across EdTech products	Reduces trust and effectiveness of solutions
3	Lack of content in local languages and practical subjects	Limits accessibility and relevance for learners
4	Slow uptake by teachers due to poor integration with pedagogy	Hinders effective classroom adoption
5	Fragmented platform landscape	Reduces interoperability and user experience
Opportunities		
1	Growing EdTech industry in Ghana	Encourages local innovation
2	Strong policy backing in ESP and government for digital content development	Encourages development and integration of EdTech solutions
3	Rising pool of creative talent in Ghana's tech/startup ecosystem	Creates a pathway for integrating localized content

4	Global demand and funding for inclusive digital content	Increases investment opportunities
5	Availability of free tools for OER, licensing, animation, and translation	Reduces production costs and improves scalability
6	Growing mobile-first audience and smart device penetration	Distribute localized educational content more widely, especially through mobile platforms.

5.4. Development of Digitized Local Curriculum-Aligned Educational Content

Education Strategic Plan (ESP) promotes the digitisation of textbooks and teacher guides. Government plans content modernization with full integration of STEAM, civic, and life skills.
Priority: Convert NaCCA-reviewed materials into multi-format (video, audio, interactive) content accessible on mobile and web.

5.5. Support for Ghanaian EdTech Startups and Local Developers

Both documents suggest structured grants, public procurement eligibility, and incubation support for Ghanaian EdTech companies.
Priority: Local content creators to receive funding, recognition, and channel access through MoE/NITA/NaCCA/TVET/CENDLOS partnership.

5.6. Promotion of Indigenous Languages in Digital Learning

ESP recommends targeted digital materials in local languages for Basic and Non-Formal Education (NFE) sectors. The government should support local language policies as part of cultural preservation.
Use: Local narrators, translators, and linguists in content localisation pipelines.

5.7. Open Educational Resources (OER) and Content Licensing

Ghana's digital content must be accessible, reusable, and licenced. The ESP highlights potential OER partnerships, and the government promotes free access through the Digital Ghana framework.
Action: National OER Policy aligned with the Creative Commons and CENDLOS standards.

5.8. Key Actions and Strategies

Action/Strategy	Expected Outcome
Establish a national EdTech content development hub, spearheaded by CENDLOS.	Increased production of localized educational content.
Provide incentives for Ghanaian EdTech content creators.	Enhanced cultural relevance of learning materials.
Support grants and tax relief for local EdTech startups	Lower costs of educational technologies to make digital learning tools more affordable for schools, especially in underserved communities.

Digitize and translate core curriculum into 15 major local languages	Enhance inclusivity and learner engagement
Mandate open licensing for all MoE-funded content	Guarantee equitable access and sharing
Launch national repository and content discovery platform	Centralize access and drive teacher adoption
Create incentives for teacher co-creation and use of digital materials	Strengthen grassroots relevance and usage

5.9. Action Plan

Action	Timeline	Resources Needed	Responsible
Establish a national EdTech content development hub spearheaded by CENDLOS	2025 - 2026	Policy support	MoE CENDLOS
Provide incentives for Ghanaian EdTech content creators	2025 - 2026	Incentive scheme design, funding, monitoring and evaluation framework	MoE, CENDLOS
Train teachers on EdTech use in classrooms	2025 - 2027	Trainers, training materials, access to ICT devices	Teacher Training Coordinator
Digitize and translate core curriculum into 15 major local languages	2025 - 2030	Curriculum experts, translators, digital platforms, funding	NaCCA, CENDLOS
Implement EdTech tools in 10 pilot schools	2025	ICT tools, internet access, training support staff	Project Implementation Manager
Create incentives for teacher co-creation and use of localized digital materials.	2026	Incentive mechanisms, training programs, digital tools.	MoE, NTC, CENDLOS
Define digital content standards and guidelines.	2025-2026	Curriculum experts, accessibility experts, international digital content standards framework	NaCCA, CENDLOS
Form a national digital content creation team.	2026-2030	Curriculum experts, accessibility experts, teachers	NaCCA, CENDLOS

5.10. Performance Indicators

Indicator	Target	Data Source	Frequency
Percentage of teachers trained on EdTech	65% of teachers trained	Training attendance records, post-training assessments	Quarterly
Number of Localized Content created	One subject (JHS/SHS) fully localized in 5 years	School census from EMIS and NaSIA Annual School Inspections Report	Annually
Improvement in Teacher Efficiency after the use of localized content created	TBD	Monitoring and Evaluation from NTC, NaSIA	Annually
Learners' performance in all subjects in localized content	80% improvement in test scores	Learner performance data, exam results	Annually
Number of schools using localized content created	50% schools using localized content created	School ICT implementation reports	Semi-annually
Feedback from teachers on effectiveness of localized content created	85% positive feedback	Teacher surveys, focus groups	Termly/Semester/ Trimester
Percentage of digital content standards and guidelines developed.	100%	Digital content standards and guidelines document	Annually

5.11. Risk Assessment

Risk	Impact	Likelihood	Mitigation Strategy
Teacher readiness for EdTech integration	High - delays in project timeline	Medium	Provide extensive professional development and support throughout the process.
Inadequate EdTech infrastructure in schools to support usage of localized digitized content.	High - hindered project rollout	High	Ensure necessary resources are secured before implementation; seek partnerships.
Resistance to technology by teachers	Medium - reduced engagement	Medium	Conduct awareness and motivation sessions for both teachers and learners.

| Data privacy concerns with online tools | High - compromised privacy | Low | Implement data protection policies and use secure platforms compliant with privacy laws. |
| Budget constraints for scaling localized content creation. | High - limited reach | Medium | Seek additional funding through grants or partnerships; prioritize resources |

5.12 Roles and Responsibilities

Role	Responsibility	Expected Contribution
MoE/CENDLOS	Formulation of EdTech Implementation Policy	Policy and budgetary allocation
GES/NaSIA/GTEC/TVET	ICT Policy Implementation	Regulation, Monitoring and Evaluation
NITA/GIFEC/MNOs/ISPs	Bridge the digital divide gap	Provide Connectivity Infrastructure
CENDLOS	Coordination of all stakeholders to align EdTech Standards	Coordinate all stakeholders to ensure alignment.
Donor Partners	Technical Support (Funding and capacity building)	Funding and project support
Tech Hub/National EdTech Steering Committee, National Digital Content Creation Team	Technical support (develop local educational content)	Local Content Creation, promote local ICT solutions tailored for education, Skills training and mentorship digital literacy.

5.13 Alignment with Other Pillars

i. Complements Curriculum and ICT Integration by providing relevant content. By providing relevant content that aligns with modern educational practices, the project enhances the curriculum with ICT resources, enabling teachers to deliver lessons and engage learners better.

ii. Supports Inclusivity and Accessibility through localised digital resources. The use of localised digital resources ensures that all individuals, regardless of location or background, have equal access to quality education. ICT tools will be accessible in multiple languages and tailored to different learning needs.

iii. Support Management and Administration pillars in enforcing intellectual property rights protection laws to encourage EdTech local content developers.

Thematic Area 5: Capacity Building (Training and Support)

6.1 Vision

Equip educators, learners, and administrators with the skills and knowledge to effectively utilise EdTech tools.

6.2 Objectives

Number	Objectives
1	Implement digital literacy training programs as core courses for teachers to enhance pedagogical skills.
2	Provide technical support for users (Educators, Learners, and Administrators)
3	Equip education managers with digital skills for improved management and decision making
4	Strengthen Professional Learning Communities (PLC) to provide peer to peer mentoring and coaching
5	Enhance Learner Digital Literacy for improved learning outcomes / lifelong learning
6	Boost the Ghanaian teacher profile for the international market

6.3 Challenges and Opportunities

Category	Description	Impact/Significance
Challenges		
1	Inadequate funding for continuous training.	Slows adoption of EdTech solutions. Slows professional development
2	Inadequate Digital Infrastructure (Devices, networking equipment, Interactive whiteboards and projectors, connectivity etc.)	Limits equitable access to quality education and hinders the full potential of EdTech solutions, especially in underserved areas.
3	Low motivation in adopting EdTech solutions among educators	Reluctance in EdTech adoption
4	Limited digital literacy among teachers and learners.	Reduces the effectiveness of technology in education. Increase teacher time on task
5	Inadequate Technical Support	Makes technology adoption difficult
6	High Cost of Implementation	Exacerbates inequalities in access to quality education
7	Slow adaptability to change by educators and administrators	Slows adoption of EdTech solutions. Teachers' resistance to change.
Opportunities		
1	Government and Private Sector Collaboration in Edtech solutions	Reduces cost and increases outreach.

2	Integration of digital skills in Teacher Certification Programs	Ensure widespread adoption
3	Use of Open Educational Resources (OERs)	Reduce content costs, improve accessibility and contributing to knowledge sharing
4	Peer Learning and Train-the-Trainer Models	Drive knowledge-sharing and sustainability
5	Leverage online platforms for remote training.	Expand access to training programs.
6	Growing Mobile & Internet Penetration	Support mobile-based learning solutions

6.4 Teacher Digital Literacy and Pedagogical Training

i. Develop comprehensive teacher-training programs to leverage ICT tools and their pedagogical applications.
ii. Introduce micro-credentialing and certification programs to incentivize teachers.
iii. Integrate digital competency requirements into teacher-education programmes.
iv. Provide a comprehensive teacher resource pack (IT)
v. Integrate digital literacy in the curriculum

6.5 Continuous Professional Development (CPD) for Educators

i. Implement a structured CPD framework aligned with the ICT in Education Policy.
ii. Leverage existing online/offline CPD platforms for self-paced learning.
iii. Leverage on Professional Learning Communities (PLC) to promote EdTech training for teachers.
iv. Enhancing partnerships and collaborations with PPPs to provide free EdTech training for teachers is recommended.
v. Develop and Enforce National Digital Competency Framework Standards.
vi. Incentivise participation and performance in the EdTech program for teachers.

6.6 Learner Digital Skills Development Programs

i. Introduce computer programming, computational thinking, and digital literacy programs at all levels of education.
ii. Encourage learner participation in technology-driven projects and competitions.
iii. Career readiness and digital job preparation skills for learners.

6.7. Training for School Leaders and Administrators

i. Promote data-driven decision-making through digital tools: Help school leaders understand how to use data to make informed decisions and improve learning outcomes.
ii. Provide training on technological integration and edtech tools: Provide school leaders with the knowledge and skills to select, implement and manage technological tools effectively

iii.   Train school leaders to lead change effectively, especially in an environment that requires technological adoption and shift in teaching methods.

iv.   Equip school leaders with the skills needed to manage and lead in a digital-first educational environment.

v.   Provide cybersecurity, digital safety, and data protection training for school leaders.

6.8 Key Actions and Strategies

Action/Strategy	Expected Outcome
Establish a national digital t raining program that provides certification to incentivise teachers to undertake digital learning programs.	Increased digital competencies and adoption among teachers.
Provide certification to incentivise teachers to undertake digital learning training programs.	High adoption of digital tools.
Develop a peer mentoring and coaching system.	Strengthened/enhanced knowledge transfer and support.
Support the development of ICT resource centers across schools.	Increased access to digital learning resources and support.
Leverage growing mobile and internet penetration to expand mobile-based learning programs.	Enhanced accessibility to digital education, enabling flexible and inclusive learning opportunities.
Leverage on existing learning platforms and training workshops organized for teachers	Provide easy adoption of the ICT training

6.9 Action Plan

Action	Timeline	Resources Needed	Responsible
Provide certification to incentivize teachers to undertake digital learning training programs	2025 – 2029	Incentives, certification courses, policy framework.	NTC, GES, GTVET, CENDLOS, NaCCA, NaSIA
Develop a peer mentoring and coaching system.	2026 – 2028	Training workshops, mentorship guidelines, ICT facilitators	GES, GTVET, NTC, NaCCA, NaSIA
Develop ICT resource centers across schools.	2025 – 2029	Computers, internet infrastructure, digital content, funding for school ICT labs.	GIFEC, CENDLOS, GES, NITA, Telcos
Implement learner digital skills development programs.	2025 – 2029	Training materials, collaboration with PPPs	CENDLOS, GES, GTVET, NaCCA

Train school leaders and administrators on digital transformation.	2025 – 2027	Leadership training modules, EdTech consultants, funding.	GES, CENDLOS, GTEC, GTVET, NTC, NaCCA, NaSIA
Monitor and evaluate EdTech strategy implementation.	2025 – 2029	Data collection tools, assessment frameworks, research experts, funding.	GES, MoE, CENDLOS, GTVET, NTC, NaCCA, NaSIA
Develop a BYOD framework to support growing mobile and internet penetration to expand mobile-based learning programs.	2025 - 2029	Technical policy experts	MoE, NTC GES, GTVETS CENDLOS, NaCCA, NaSIA

6.10 Performance Indicators (600000 teachers)

Indicator	Target	Data Source	Frequency
Percentage of teachers trained in digital literacy.	50% of teachers trained by 2029.	Training program reports, school records.	Annual
Number of teachers certified in EdTech programs.	25% of teachers certified by 2029.	Certification databases, CPD records	Bi-Annual
Percentage of schools with functional ICT resource centers	30% of schools equipped by 2029	School ICT infrastructure reports.	Annual
Number of peer mentoring and coaching programs established.	At least 10 mentoring programs launched by 2029.	GES reports from district education offices	Annual
Percentage of learners with access to digital learning tools.	5 million of learners have access by 2029	School surveys, LMS usage data, EMIS data.	Annual

6.11 Risk Assessment

Risk	Impact	Likelihood	Mitigation Strategy
Inadequate funding	Delays in training programs	High	Seek funding (PPPs)
Resistance to change	Low adoption of digital tools	Low	Creation of awareness Creation of incentives
Curriculum alignment	Hinders the achievement of learning objectives	High	Seek funding Expert inclusion Policy direction

Change in management	Discontinuation of existing developed policies Loss of institutional memory	High	Develop and institutionalise policies to enhance continuity
Inadequate monitoring and evaluation	Ineffective implementation Low achievement of policy objective	Moderate	Institute effective monitoring and evaluation plan Dedicated funding
Infrastructural limitation	Ineffective implementation	High	Dedicated funding

6.12 Roles and Responsibilities

Role	Responsibility	Expected Contribution
MoE	Policy direction and funding	Ensures national alignment
GES/ NTC/ CENDLOS/ TVET	Training implementation	Develops teacher capacity
NaCCA	Curriculum development	Curriculum enhancement
NaSIA	Inspection	Proper implementation of existing standards
NITA	Digital services	Ensure digital service delivery
NGOs and Development Partners	Technical and financial Support	Expands outreach and impact

6.13 Alignment with Other Pillars

  i.   Strengthen Curriculum and ICT Integration by ensuring effective teaching and learning.
 ii.   Support Cybersecurity and Digital Safety through awareness training.
iii.   Governance: Establish policies and frameworks for the national digital training program and certification standards for teachers.
 iv.   Management and Administration – Empower school leaders and administrators through peer mentoring and coaching systems to oversee digital learning adoption.
  v.   Infrastructure and Connectivity – Support the development of ICT resource centres in schools to enhance access to digital learning tools and resources.
 vi.   Capacity Building – Directly implement a national digital training program that equips educators with ICT competencies and provides certification.
vii.   Inclusivity and Accessibility: Expand opportunities for teachers and learners in remote areas by leveraging growing mobile and Internet penetration for mobile-based learning.
viii.   Data Protection – Embed training on secure data-handling practices as part of ICT certification programs to protect learner and institutional data.

Thematic Area 6: Curriculum and ICT Integration

7.1 Vision

To integrate ICT effectively into the national curriculum to improve learning outcomes and ensure learners develop 21st century skills

7.2 Objectives

Number	Objectives
1	Develop technological pedagogical frameworks for teachers to ensure improved learning outcomes
2	Integrate modern educational technologies and interactive tools to enhance teaching and learning
3	Establish a well-defined strategy that outlines how ICT will be integrated across curricular for teachers and learners
4	Establish partnerships with industry to enhance ICT curriculum development
5	Establish a set of rules and procedures for developing, creating and use of appropriate electronic content

7.3 Challenges and Opportunities

Category	Description	Impact/Significance
Challenges		
1	Resistance to ICT adoption in traditional teaching methods	Slows down the pace of digital transformation in education
2	Insufficient digital resources in schools	Limits learners' exposure to technology
3	Limited internet connectivity and unreliable power supply	Hinders access to online learning platforms and digital tools
4	High cost of ICT infrastructure and maintenance.	Makes it difficult for schools, especially in rural areas, to sustain digital education initiatives
5	Inadequate digital literacy among teachers and learners	Reduces the effectiveness of ICT integration in the teaching and learning process
6	Inadequate localized digital content tailored to national curricula	Limits the relevance and effectiveness of ICT-based learning materials in the local context
Opportunities		
1	Expanding access to open educational resources (OER)	Reduces costs and enhances accessibility to quality learning materials

2	Leveraging offline solutions or cloud-based solutions for content delivery	Reduces cost and enhances accessibility
3	Integrating digital skills into national curriculum	Prepares learners for lifelong careers in a technology-driven economy
4	Leveraging emerging AI and adaptive learning technologies	Enables personalized learning experiences for learners
5	Pursue Public-Private Partnerships in ICT for education	Encourages investment and innovation in digital learning infrastructure and content

7.4. Embedding ICT into National Education Curriculum

i. Align with ESP 2018-2030
ii. *Align with Curriculum standards: ICT* integration should complement subject-specific learning outcomes
iii. *Progressive Digital Skills Development:* Introduce ICT competencies progressively from early childhood to tertiary education.
iv. *Contextualise and provide inclusive content*: Digitise locally relevant learning materials to be culturally appropriate and accessible to all learners.
v. *Blended Learning Approaches*: Encourage a combination of face-to-face and digital learning.
vi. *Teacher Readiness and Capacity Building:* Train Education managers and administrators to integrate ICT effectively into their teaching and learning.
vii. Develop an inclusive curriculum suitable for all learners
viii. Address gender based and socio-emotional issues of teachers and learners

7.5 Use of Digital Tools for Teaching and Learning

7.5.1 Developing a Technological Pedagogy Framework

i. Embed ICT literacy into the curriculum.
ii. Digital tools must align with learning outcomes, assessment strategies, and learner needs.
iii. Guidelines for selecting appropriate digital resources for different subjects and grade levels should be established.

7.5.2 Training and Capacity Building for Teachers

i. Continuous Professional Development (CPD): Regular training on digital tools, virtual learning platforms, and online assessment strategies.
ii. Peer Mentorship Programs: Establish a teacher-to-teacher support system to enhance knowledge sharing on digital teaching strategies.
iii. Pre-Service and In-Service Training: Embed ICT pedagogy into teacher education programmes and conduct ongoing workshops for teachers in active service.

7.5.3 Ensuring Equitable Access to Technological Tools

   i.   Provide subsidised devices (tablets, laptops, smartboards) to schools, especially in underserved areas.
  ii.   Implement BYOD policies while ensuring safety and security measures.
 iii.   Develop cloud-based and offline learning solutions to cater for schools with limited internet access, e.g., iCampusgh, iBox, Learning Passport
  iv.   Set up inclusive ICT resource centers in schools and community learning hubs.

7.5.4 Utilizing Learning Management Systems (LMS) and E-Learning Platforms

   i.   Integrate iCampusgh, iBox, Learning Passport, Minecraft Education, etc. into lesson planning.
  ii.   Use cloud-based platforms to store and share learning materials, assessments, and learner portfolios
 iii.   Encourage blended learning models that combine online and in-person instruction.

7.5.5 Incorporating Interactive and Multimedia Learning Tools

   i.   Use videos, animations, simulations, etc., to explain complex concepts.
  ii.   Integrate gamified learning platforms, such as Minecraft Education, to make lessons more engaging.
 iii.   Leverage Augmented Reality (AR) and Virtual Reality (VR) for immersive learning experiences in science and geography.
  iv.   Encourage the use of digital storytelling tools to enhance literacy skills.

7.5.6 Enhancing Digital Assessment and Feedback Mechanisms

   i.   Use online quizzes and auto-graded assessments for instant feedback.
  ii.   Leverage AI-powered tools to analyse learner performance and provide personalised learning recommendations.
 iii.   Implement e-portfolios in which learners can track their progress and showcase their digital skills.

7.5.7 Promoting Collaborative and Project-Based Learning

   i.   Online discussion forums (*iBox, iCampusgh*) for group discussion
  ii.   Cloud-based collaboration tools, such as Google Drive and Microsoft OneDrive, for co-authoring and sharing documents.
 iii.   Virtual project-based learning with real-world applications, engaging learners in cross-school and international collaborations.

7.5.8 Developing Guidelines for Safe and Responsible Digital Use

   i.   Teach digital citizenship and cybersecurity awareness as part of the ICT curriculum.
  ii.   Implement data protection policies for learner information and online activities.
 iii.   Encourage safe online interactions and responsible use of digital tools in the classroom.
  iv.   Create awareness of potential hazards in the use of digital tools.

7.6. Strategies for STEM and Computational Thinking

7.6.1 Embedding STEM Across Subjects

    i.   Use ICT tools to simulate scientific experiments and engineering designs in subjects such as physics, chemistry, and biology.

    ii.   Integrate coding and programming skills into mathematics lessons to solve real-life problems (e.g. calculating data trends or creating mathematical models).

    iii.   Design thinking approaches in technology and engineering that apply scientific concepts to solve practical issues.

7.6.2 Encouraging Computational Thinking

    i.   Introduce coding and algorithmic logic early in the educational journey (e.g. through block-based coding platforms such as Scratch, moving to more advanced programming languages such as Python and JavaScript in secondary education).

    ii.   Problem-solving activities should align with computational thinking principles, such as breaking complex problems into manageable parts, identifying patterns, abstracting key elements, and designing algorithms.

    iii.   Use interactive digital tools that simulate problem-solving environments where learners can create and test algorithms (e.g., using robots or games like Minecraft to implement computational thinking).

7.6.3 Developing Practical STEM Skills through Project-Based Learning

    i.   Design STEM challenges where learners can develop prototypes or solutions to current issues (e.g. climate change, energy efficiency, space exploration) using ICT.

    ii.   Involve Projects, data analysis, and visualisation tools, allowing learners to interpret large datasets, identify patterns, and draw conclusions using technologies such as Excel, Python, or other data analysis tools.

    iii.   Use collaborative digital platforms for teamwork on STEM projects, where learners from different schools or even countries can work together on common challenges, fostering international collaboration.

7.6.4 Teacher Education and Professional Development

    i.   Establish regular CPD programs for educators, focusing on the integration of computational thinking and STEM teaching strategies.

    ii.   Train educators in the use of educational technologies such as virtual labs, simulations, and interactive whiteboards that make abstract STEM concepts more accessible.

    iii.   Encourage peer mentoring and collaborative teaching methods to allow educators to share best practices in teaching STEM with ICT.

7.6.5 Industry - Community Collaboration

  i.   Partner schools with local tech companies and industries to provide workshops, guest lectures, and internships for learners, helping them see how STEM skills are applied in the workforce.
 ii.   Organise hackathons and STEM competitions to encourage learners to tackle real-world problems using STEM principles and computational thinking.
iii.   Collaborate with educational and research institutions can allow learners to work on advanced projects and gain insights into current research in fields like artificial intelligence, robotics, and sustainable engineering.

7.6.6 Inclusive Education in STEM

  i.   Employ differentiated learning strategies to cater to the diverse needs of learners, ensuring that all learners can engage with STEM content at a level appropriate to their abilities.
 ii.   Integrate assistive technologies into the curriculum to support learners with special learning needs, ensuring their full participation in STEM and computational thinking activities.
iii.   Implement programs that specifically aim to encourage girls and underrepresented groups to pursue STEM-related fields through mentorship and targeted initiatives.

7.6.7 Using Data to Drive Instruction

  i.   Employ analytic tools to track learner progress in STEM subjects and provide teachers with data to inform instruction and identify learners who may need additional support.
 ii.   Use adaptive learning technologies to tailor STEM education to each learner's pace and learning style, helping to ensure mastery of the concepts before progressing.
iii.   Assess teachers progress, learner outcomes, and achievements.

7.7 Digital Learning Framework for Different Education Levels - Early Childhood Education (ECE) – Foundational Digital Literacy

  i.   Use of multimedia storytelling and interactive learning apps to develop literacy and numeracy skills.
 ii.   Use Age-appropriate digital games to build cognitive and problem-solving abilities.
iii.   Use Basic digital skills training (e.g. identifying devices, using touchscreens, and recognising icons).
 iv.   Guided parental engagement programs for at-home digital learning support.
  v.   Safe and supervised ICT use policies to ensure responsible screen time.

7.7.1 Primary Education – Building Digital Competency and Computational Thinking

  i.   Introduce block-based coding using platforms like Scratch
 ii.   Integrate digital learning tools into subjects (e.g. using educational games for math, digital storytelling for language development).
iii.   Engage in Collaborative digital projects that encourage creativity and teamwork.
 iv.   Implement basic cybersecurity and digital citizenship training to promote safe online behaviour.
  v.   Use of assistive technologies for inclusive education and accessibility.

7.7.2 Junior High School – Digital Learning as a Tool for Subject Mastery
    i.   Establish advanced coding and robotics programs to reinforce logical thinking.
    ii.   Create digital content (e.g. multimedia presentations, basic graphic design).
    iii.   Embed project-based STEM learning through virtual labs and simulations.
    iv.   Roll out Research and information literacy training for evaluating digital sources.
    v.   Roll out Blended learning approaches (using Learning Management Systems like iCampusgh and Learning Passport etc.)

7.7.3 Senior High School – Specialization and Career Readiness
    i.   Roll out advanced programming courses (e.g. Python, Java, and AI fundamentals).
    ii.   Implement Entrepreneurial ICT training (e.g. digital marketing, e-commerce, tech startups).
    iii.   Promote STEM innovation projects (e.g. IoT, data science, and climate technology).
    iv.   Roll out Internships and industry partnerships to provide real-world ICT applications.
    v.   Introduce Cloud-based collaborative learning and self-paced online courses.

7.7.4 Tertiary Education – Digital Innovation and Workforce Integration
    i.   Specialised ICT courses (e.g. cybersecurity, blockchain, and cloud computing).
    ii.   Establish technology incubators and innovation hubs for digital entrepreneurship.
    iii.   Establish Blended and online learning models using virtual labs, Augmented Reality (AR) etc.
    iv.   Integrate Industry collaboration into curriculum design for experiential learning.
    v.   Promote Learner-led ICT projects to address real-world challenges.

7.7.5 Teacher Education and Continuous Professional Development (CPD)
    i.   Promote pre-service and in-service ICT training programs for teachers.
    ii.   Encourage the use of digital teaching resources and e-assessment tools.
    iii.   Promote peer mentoring and online professional learning communities.
    iv.   Provide certification in digital pedagogy and EdTech integration.

7.8 Key Actions and Strategies

Action/Strategy	Expected Outcome
Develop ICT-integrated curricula for primary, secondary, and tertiary levels.	Digital learning embedded in teaching, learning and assessment processes.
Provide digital teaching resources and ICT training for teachers.	Improved teacher effectiveness in digital education.
Specify the types of technologies to be integrated (e.g., computers, tablets, interactive whiteboards, etc.,) and how they align with educational goals	Strategic adoption of relevant EdTech solutions to enhance educational outcomes.

Develop a module on how ICT can be incorporated at various levels	Structured guidance for seamless ICT integration in teaching and learning provided.
Train teachers (In-service and Pre-service) on how to incorporate ICT in teaching and learning	Educators equipped with the skills to effectively use digital tools in pedagogy.
Build the capacity for teachers to create multimedia content, interactive lessons, quizzes and online assignments.	Enhanced teachers' ability to develop engaging and interactive learning materials.
Collaborate with industry in designing curriculum and provision of experiential learning for learners	Increased learners' practical exposure to real-world applications of ICT skills.
Institute events that challenge learners to come up with innovative ICT solutions to emerging problems	Increased creativity, problem-solving, and entrepreneurship among learners.
Develop guidelines and content that are locally salient and contextual, culturally sensitive and age appropriate.	Inclusive, relatable and relevant digital education guidelines developed
Establish minimum accessibility criteria for e-content development.	Promotes inclusive education by ensuring digital learning materials are accessible to all learners including those with special learning needs.

7.9 Action Plan

Action	Timeline	Resources Needed	Responsible
Develop ICT-integrated curricula for tertiary and pre-tertiary levels.	2025 – 2027	Curriculum experts, ICT specialists, digital content development tools.	MoE, GTEC, GES, NaCCA, CENDLOS
Provide digital teaching resources and ICT training for teachers.	2025 – 2029	Digital devices, online learning platforms, internet, training facilitators	GES, CTVETS, NTC CENDLOS, NITA, Telcos
Specify the types of technologies to be integrated and how they align with educational goals.	2025 – 2026	Needs assessment tools, ICT procurement plans, EdTech consultants.	GES, GTVETS, NaSIA, GTEC, NTC, NaCCA, CENDLOS

Develop a module on how ICT can be incorporated at various levels.	2025 – 2026	Module development team, digital pedagogy experts, funding	GES, GTVETS, NaSIA, GTEC, NTC, NaCCA, CENDLOS, MoE
Train teachers (In-service and Pre-service) on how to incorporate ICT in teaching and learning.	2025 – 2029	Training facilities, learning management systems, digital course materials.	GES, GTVETS, GTEC, NTC, NaSIA, CENDLOS
Build the capacity for teachers to create multimedia content, interactive quizzes, lessons and online assignments.	2025 – 2028	Multimedia software, content creation workshops, ICT labs.	MoE, PRE-TERTIARY/ TERTIARY, GES, GTVETS, GTEC, CENDLOS, NCA, MoCD, CEA
Collaborate with industry in designing curriculum and provision of experiential learning for learners.	2026-2029	industry partnerships, internship programs, funding.	NaCCA, INDUSTRIES, GES, GTVETS, GTEC, NTC, MoE
Institute events that challenge learners to come up with innovative ICT solutions to emerging problems.	2026 – 2029	Hackathon funding, mentorship programs, ICT labs.	MoE, INDUSTRIES, GES, GTVETS, GTEC, NTC
Develop guidelines and content that are locally salient, contextual, culturally sensitive, and age appropriate.	2025 – 2027	Content development experts, policymakers, education researchers.	NaCCA, CENDLOS, GES, GTVETS, NTC, MoE
Establish minimum accessibility criteria for e-content development.	2025 – 2027	Accessibility guidelines, inclusive digital design experts, assistive, technology.	CENDLOS, NaCCA, NTC, GES

7.10 Performance Indicators

Indicator	Target	Data Source	Frequency
Percentage of schools implementing ICT-integrated curricula.	30% of primary, secondary, and tertiary institutions by 2029.	MoE, GES, TVET reports, and other relevant agencies	Annually
Number of teachers trained in ICT integration for curriculum delivery.	30% teachers trained by 2029.	Teacher training reports, professional development records.	Annually
Availability of digital teaching and learning resources aligned with the national curriculum.	Digital resources available for all subjects at each level by 2027.	MoE database, school ICT infrastructure reports	Annually
Learner proficiency in digital literacy and ICT-based problem-solving.	30% of learners demonstrate competency in ICT skills by 2029.	National learner ICT assessments, standardized digital literacy tests.	Bi-annually
Number of subject-specific digital modules developed and adopted.	Digital modules integrated into all subjects per level by 2029.	Curriculum development reports, educational publisher records.	Annually
Teacher capacity to create digital learning content (e.g., multimedia, quizzes, online assignments).	30% of teachers trained in content creation by 2028.	CPD training records, teacher certification databases.	Annually
Percentage of schools with adequate ICT infrastructure to support curriculum integration.	20% of schools equipped with ICT labs and digital tools by 2029.	ICT infrastructure reports, school inspection data.	Annually
Learner participation in ICT-driven innovation challenges and problem-solving events.	At least 2000 learners engaged in national EdTech by competitions by 2029.	Event participation records, competition reports.	Annually
Industry collaborations for ICT-integrated curriculum design and experiential learning.	At least 20 industry partnerships established by 2028.	MoE-Industry partnership reports, internship and apprenticeship data.	Annually
Development of ICT accessibility standards for curriculum-aligned digital content.	National accessibility framework established by 2026.	MoE ICT policy documents, accessibility compliance audits.	One-time policy evaluation, then every 3 years

7.11 Risk Assessment

Risk	Impact	Likelihood	Mitigation Strategy
Insufficient training for teachers in ICT integration.	Reduces the effectiveness of digital education.	High	Develop structured ICT training programs, integrate digital literacy into teacher education, and establish peer mentoring systems
Rapid technological advancements leading to outdated infrastructure.	Creates challenges in maintaining relevant and updated ICT tools.	Low	Establish regular EdTech evaluations, ensure flexibility in procurement policies, and adopt scalable digital solutions.
Insufficient collaboration between education institutions and industry	Limits learners' exposure to real-world ICT applications.	Medium	Strengthen industry partnerships, introduce experiential learning opportunities, and incorporate emerging industry trends into the curriculum.

7.12 Roles and Responsibilities

Role	Responsibility	Expected Contribution
NaCCA	ICT module development on how ICT can be incorporated at various levels	Ensures the module aligns with national curriculum
Ministry of Education (MoE)	Provides policy direction, funding, and oversight for ICT integration in the curriculum.	Drive the successful implementation of ICT-based education strategies.
Ghana Education Service (GES)	Implement ICT-focused teacher training programs and oversee curriculum adoption in schools.	Facilitate the widespread adoption of digital education resources in pre-tertiary schools.
Teacher Education Institutions	Incorporate ICT pedagogical training in pre-service and in-service teacher programs.	Equip educators with digital literacy and teaching skills for effective ICT integration.
National Information Technology Agency (NITA)	Develop and enforce ICT standards for digital education infrastructure.	Ensure a secure and efficient ICT ecosystem to support learning.
Telecom Providers	Expand internet connectivity and support mobile-based learning initiatives.	Improve digital access for schools, particularly in underserved areas.

School Leaders and Administrators	Oversee the integration of ICT in school operations and classroom teaching. Monitor and evaluate the progress integration	Ensure effective implementation of digital learning policies at the institutional level.
Parents & Guardians	Support learners in digital learning at home and promote responsible use of technology.	Enhance learner engagement with ICT resources beyond the classroom.

7.13 Alignment with Other Pillars

i. Supports Capacity Building by equipping teachers with the necessary ICT skills.
ii. Aligns with Localised Content Creation by ensuring culturally relevant digital content.
iii. Governance: Supports the establishment of rules and procedures for developing, creating, and using appropriate electronic content to ensure compliance with national policies.
iv. Management and Administration – Provides school leaders with a digital pedagogical framework that enables effective ICT adoption and decision-making at the administrative level.
v. Curriculum and ICT Integration – Establishes a strategy to integrate ICT across all subjects and levels, ensuring a structured and comprehensive digital learning experience.
vi. Inclusivity and Accessibility – Ensures that digital pedagogical frameworks and educational technologies support diverse learning needs, including those of learners with special needs.

Thematic Area 7: Inclusivity and Accessibility

8.1. Vision

Ensure equitable access to digital education tools and platforms for all learners, including marginalised communities, rural and underserved areas, and learners with special education needs (SEN).

8.2. Objectives

Number	Objective Description
1	Develop inclusive EdTech solutions for learners with SEN.
2	Expand digital learning opportunities in urban, rural and underserved areas.
3	Develop local-bespoke educational support services, including AT, specialized instructional methods, and adaptive learning materials unique to all learners.
4	Implement local and specialized educational support services and assistive technologies, specialized instructional methods, and adaptive learning materials for all learners.
5	Train educators, school administrators, and communities on inclusive strategies, special needs awareness, and culturally responsive pedagogy in schools and communities.
6	Partner with families, local organizations, and stakeholders to create a supportive network that enhances learning opportunities, social integration and overall well-being of diverse learner groups.

8.3. Challenges and Opportunities

Category	Description	Impact/Significance
Challenges		
1	Limited assistive technology for learners with special needs.	Excludes vulnerable learners from digital education.
2	Lack of or poor ICT infrastructure (devices and internet connectivity) in rural and underserved areas.	Excludes marginalised learners and teachers from digital education. Teachers and learners do not have opportunities to explore and adapt up-to-date innovative approaches to teaching and learning. Learners in the long term are less competitive in higher education and job markets that increasingly demand ICT proficiency.
3	Cultural stereotypes, limited access to technology, and a lack of female role models in STEM fields.	Limit girls, boys and women equally participating in and benefiting from digital learning opportunities.

4	Inadequate training of teachers in using assistive technologies to support learners with special needs.	Teachers are ineffective in meeting the specific learning needs of learners. Disengagement and underperformance among learners with special needs.
5	Unsafe school environment (conduciveness and security) for ICT equipment	Theft, frequent breakdown and high maintenance cost of ICT equipment
Opportunities		
1	Government and NGOs collaboration for inclusive digital education.	Enhances access and equity in education delivery.
2	Integration of inclusive Universal Design for Learning principles into national education standards.	Creates opportunities for multiple modes of learning for learners with special needs
3	Encouragement of local innovation and an inclusive Edtech solutions market.	Creates avenues for localisation and contextualisation of Edtech solutions

8.4 Digital Learning for Urban, Rural and Underserved Communities

Equitable access to digital education tools and platforms for all learners, including marginalised communities, rural and underserved areas, and learners with SEN, provides opportunities for fair competition and social mobility. A strategic approach to meeting this goal includes the following:

1. Create culturally relevant and language-specific digital content to ensure learners can relate to and engage with the material
2. Develop modules for pre-service and in-service teachers in the use of assistive technologies to support teaching and learning
3. Collaborate with NGO's, PPPs, DPs, Telcos, Tech companies, and educators for funding, building, development, and providing affordable devices and Internet access to marginalised communities.
4. Develop and distribute offline educational content (e.g. preloaded tablets) for areas with limited or no Internet connectivity.
5. Leverage mobile phones, with limitations to deliver bite-sized educational content via SMS, WhatsApp, or mobile apps to reach learners in remote areas.
6. Establish mobile digital learning centres in rural and underserved communities.

8.5 Special Education Needs (SEN) and Assistive Technologies

There is a need for explicit advocacy for government and donor funding to ensure that schools have the necessary assistive technologies and resources targeted at special needs. Learners with special education needs are in well-resourced and underserved communities; some schools are progressively moving toward integrating learners with SEN into mainstream classrooms, while unit schools remain in existence. Specific strategies to ensure sustained and focused efforts include the following:

1. Develop and provide assistive technologies (e.g. screen readers, speech-to-text software, and Braille displays) tailored to the needs of learners with SEN.
2. Design digital platforms that are accessible to all learners with SEN.
3. Train educators on how to use assistive technologies and implement inclusive teaching strategies.
4. Sensitise parents, opinion leaders, religious bodies, and communities on the importance of assistive technologies and how to support learners with SEN.
5. Use digital tools to identify learners with SEN early and provide targeted interventions.

8.6 Gender Equity in ICT Education

Gender equity in ICT education is critical for unlocking the full potential of Ghana's digital future. It is important that a balanced approach addresses the distinct barriers that different genders face. An effective strategy should recognise that boys and girls face vulnerabilities, and programs should be designed to uplift all learners equitably. Systemic barriers, such as cultural stereotypes, limited access to technology, and a lack of female role models in STEM fields, persistently hinder girls and women from equally participating in and benefiting from digital learning opportunities.

1. Launch programs that encourage girls and boys to pursue ICT education and careers, such as coding clubs, mentorship programs, and scholarships.
2. Develop digital content that challenges gender stereotypes and promotes equal participation of boys and girls in ICT.
3. Create safe and supportive environments for girls and boys to learn and explore ICT without fear of discrimination or harassment.
4. Highlight successful women in STEM through digital campaigns and workshops to inspire girls to pursue STEM-related careers.
5. Educate parents on the importance of ICT education for girls and address the cultural barriers that may limit their participation.
6. Track and monitor gender participation in ICT programs and use data to address gaps and improve equity.

8.7 Bridging the Digital Divide

Efforts to bridge the digital divide must address issues of physical access, digital literacy, meaningful use, and the ability to derive socio-economic benefits from technology.

1. Partner with telecom companies to provide subsidised or free Internet access to schools and communities in rural, urban, and underserved areas.
2. Fair distribution of low-cost or subsidised devices (e.g. laptops and tablets) to learners in underserved areas.
3. Invest in building reliable electricity and Internet infrastructure in rural and underserved areas.
4. Advocate for programs that promote digital inclusion, such as tax reliefs for companies providing affordable tech solutions.

5. Engage local leaders and communities in the planning and implementation of digital inclusion initiatives to ensure sustainability.
6. Integrate ICT Teacher Competency Frameworks at the operational level.
7. Train teachers to incorporate digital literacy skills into the curriculum across subjects.

8.8 Key Actions and Strategies

Actions/Strategy	Expected Outcomes
Partner with telecoms, tech firms, NGOs to provide affordable devices and subsidized internet.	Increased connectivity and digital participation in marginalized communities.
Distribute offline educational content via preloaded tablets and storage devices.	Learning continuity in areas with little or no internet access.
Distribute of low-cost/subsidized digital devices to learners.	Reduced digital divide and improved learner device access.
Develop assistive technologies for teaching and learning	Improved accessibility and engagement for learners with SEN.
Train teachers (preservice/inservice) on inclusive tech and pedagogy.	Enhanced teaching capacity to support diverse learners.
Sensitize parents, religious and community leaders on SEN support.	Strengthened community and home-based support for inclusive education.
Establish gender-inclusive ICT clubs and mentorships in schools.	Improved gender balance in ICT education and careers.
Create digital content that addresses gender stereotypes.	More equitable and inclusive representation in learning materials.
Promote female STEM role models via digital campaigns/workshops.	Greater aspirations and visibility of female in tech fields.
Monitor gender-disaggregated data in ICT initiatives.	Data-informed planning and targeted equity interventions.

Train teachers across subjects to integrate digital literacy and inclusive practices.	Increased learner engagement and differentiated instruction.
Produce digital content in local languages and contexts.	Greater learner engagement and cultural relevance.

8.9 Action Plan

Action	Timeline	Resources Needed	Responsible
Survey ICT Infrastructure, gaps in teacher training in SEN and Assistive Tech.	2025-2026	Survey and data analysis tools, local community liaisons	GES, CENDLOS, NITA, GIFEC
Secure funding to support the implementation of strategies	2025 - 2026	Partnerships	MoE, World Bank, UNICEF, DPs, NGOs
Procure and deploy subsidized Edtech tools, devices and assistive technologies,	2026 - 2027	Funds	MOE, DPs, NGO
Establish Community ICT Centres	2026 - 2030	Funds, technical resources	MoE, GES, NGOs, DPs, Traditional Leaders
Train teachers in EdTech integration for learners with SEN	2027 - 2029	Funding, Technical resources, training materials	GES, NTC, DPs, NGO's
Train local "tech champions" to maintain infrastructure.	2027 - 2030	Funds, Training materials	GES, Traditional Leaders, Parents, Teachers, learners, religious organizations,

8.10 Performance Indicators

Indicator	Target	Data Source	Frequency
Percentage of schools in underserved and deprived areas with ICT Infrastructure (Computer Lab)	65% of schools in underserved and deprived areas equipped with ICT facilities and tablets by 2030	EMIS, Partnership with the Universities	Annually
Percentage of schools in rural and deprived areas with internet access Percentage of learners with special needs provided with assistive technologies (AT).	65% of schools in rural and underserved areas connected with Internet by 2030	EMIS, NCA, MoE, NaCCA, NTC	Annually
Percentage of Teachers trained in EdTech integration for learners with SEN	80% of inservice teachers trained by 2030 90% of CoDE have modules developed for integration of assitives technologies for teaching and learning for preservice teachers	NTC, NaCCA, GES, PRINCOF	Annually
Percentage of girls participating in ICT initiatives and competitions Ratio of female trained teachers in Teacher Education Institutions	30% of girls in school participating in ICT initiatives and competitions (national and global) 1:1 ratio of female trained teachers to male teachers in the Teacher Education Institutions	GES, NTC, CoDE NASIA, Tertiary Education Institutions	Annually

| Inclusion of Learners with Special Needs

Number of community sensitization on the use of assistive devices by learners with SEN	5 sensitization meetings per each district	GES, NaSIA, NaCCA, NTC	Annually

8.11 Risk Assessment

Risk	Impact	Likelihood	Mitigation Strategy
Funding Shortfalls	Delayed infrastructure deployment. Gender equity programs scaled back.	High	Diversify funding sources (e.g., public-private partnerships, crowdfunding).
Teacher Interests	Loss of trained teachers in SEN.

Inconsistent implementation of inclusive practices | Moderate | Offer retention incentives (e.g., stipends, career promotion).

Establishing national teacher certification programs in Inclusive/Special Education. |
| Government Priority | Abandoned initiatives | Moderate | Integrating initiatives into existing systems and structures of implementing agencies

Embed projects into non-partisan national development plans. |
| Disaggregated Data | Inability to measure progress or adjust strategies. | Moderate | Harmonization of data to aid monitoring

Partner with universities/NGOs for third-party evaluations. |

8.12 Roles and Responsibilities

Role	Responsibility	Expected Contribution
MoE	Policy making, formulation, provision of resources, and monitoring and evaluation	National alignment ensured
GES	Recruit and Training of teachers, Enrolment of learners, Implementation, Collaborate with sister-organizations for successful implementation	Teacher capacity developed
NaCCA	Develop inclusive curriculum and assessment standards.	Curriculum reviewed to be inclusive
NaSIA	Develop and establish the standards for implementation. Supervision of standards and guidelines	New and existing Pre-Tertiary Educational Institutions licensed
Development Partners (UNICEF, World Bank, T-TEL, DFID)	Support in the provision of assistive devices for SENs, Support Training of Teachers	Inclusive education mainstreamed in schools
NTC	Training and licensing of teachers	Teacher professionalism regulated
GetFund	Provision of infrastructure, learning resources (assistive devices)	ICT and assistive devices provided and maintained regularly

8.13 Alignment with Other Pillars

i.   Strengthens Infrastructure and Connectivity and Localised Content Creation to expand rural access.

ii. Links with Cybersecurity and Digital Safety to ensure a safe learning environment for all.

iii. Develops inclusive policies through Governance & Management and Administration that mandate AI-driven and technology-assisted learning for all learners.

iv. Expands training of educators through Capacity Building (Training and Support) and Curriculum and ICT Integration for personalised and inclusive curriculum.

v.   Utilise Data Management and Reporting & Monitoring and Evaluation tools for real-time monitoring, data-driven decision-making, and continuous improvement in inclusive education.

vi. Supports AI and emerging technologies in providing smarter assistive technology and digital solutions.

Thematic Area 8: AI and Emerging Technologies

9.1. Vision

Leverage AI and emerging technologies to empower learners and teachers to create and deliver adaptive, personalised, and data-informed learning experiences.

9.2. Objectives

Number	Objectives
1	Develop and Implement AI powered adaptive learning platforms to enhance personalized learning for diverse learners.
2	Explore emerging technologies for learner records and certification.
3	Integrate emerging technologies to create interactive and hands-on learning environments.
4	Establish ethical AI guidelines to safeguard all learners and teachers.
5	Equip teachers with real-time data tools to identify learning gaps, tailor instruction, and support differentiated learning.

9.3 Challenges and Opportunities

Category	Description	Impact/Significance
Challenges		
1	Absence of an existing national regulatory framework for ethical use of AI and emerging technologies in education.	Potential misuse of AI in teaching and learning due to ethical concerns, data privacy, and security issues in AI use.
2	High cost of EdTech platforms and licensing fees	Widened digital gap between learners in underserved communities and the privileged ones. Limited deployment of AI and Emerging Technology across all areas
3	Resistance to AI due to misconceptions about automation and job replacement	Slow adoption of AI and ET tools Ineffective implementation of AI and emerging technologies.
4	Insufficient data on learner performance to feed AI algorithms	Difficulty in AI explainability, potential algorithmic bias and fairness which leads to unfair tracking, grading and recommendations for marginalized learners due to training of AI models with biased historical data.

Opportunities

1	AI enhances learning by adapting to individual learners needs.	Improved learning outcomes through tailored instruction and differentiated learning.
2	Access to open-source adaptive learning systems offer cost-effective alternatives	Leverage Generative AI and emerging technologies in providing more localized content. Inclusion of learners of different cultural backgrounds and demographics
3	Analysis of large datasets for better adaptive assessments and faster, targeted interventions	Easier and faster allocation of education resources
4	Immersive and experiential learning opportunities	Enhanced and sustained learner engagement and interest in the learning process
5	Leverage academic expertise from institutions and frameworks such as UNICEF's AI for Children and UNESCO's AI ethics guidelines for training and policy input.	Strengthens ethical AI implementation in schools

9.4 AI-Powered Personalized Learning and Assessment

To improve learner achievement, AI becomes a critical tool to ensure that learners needs are met in the provision of adaptable learning environments and experiences. AI-powered personalised learning creates more learner agency opportunities, enabling self-directed learning and providing insights to support learning. Strategies to realise these benefits include:
  i. Adopt scalable adaptive learning platforms
  ii. Implement AI-Enhanced formative and summative assessment tools
  iii. Use diagnostic AI tools for targeted interventions
  iv. Create localized learner profiles integrated with AI
  v. Provide equitable access to AI tools.
  vi. Train teachers in AI literacy and data use
  vii. Establish national guidelines for the use of AI and emerging technologies in education.
  viii.   Monitor and regulate algorithmic fairness through data quality and model training.

9.5 Use of Big Data and Machine Learning in Education

The collection, processing, and analysis of learner demographics, academic performance, attendance, online interactions, and assessment results provide insights that are otherwise not as obvious to tailor learning experiences, improve educational content, foster collaboration, and improve online learning experiences. Strategies to achieve these benefits include:
  i. Develop a national education data lake

ii. Implement predictive analytics for early warning systems for learners at risk of failing and requiring remediation to be identified.
iii. Implement personalised learning paths using Machine Learning for learners requiring intervention.
iv. Create teacher dashboards with real-time insights and profiles of learners, and formative assessment analysis at scale (national, regional, district, and school level).
v.   Support inclusive education delivery through data-driven, individualised education plans.
vi. Establish school-level benchmarking and equity monitoring systems.

9.6 Blockchain for Credentialing and Certification

The use of blockchain in education within this context recognises that the data used in AI-powered systems require a high level of protection due to their sensitive nature to preserve integrity and authenticity. Employing blockchain technology ensures that learner and teacher data on generative AI are easily verifiable and immutable to reduce the risk of fraud and enhance trust in educational qualifications.

i.   Establish a decentralized blockchain ledger for storing educational credentials, degrees, and certifications.
ii. Adapt smart contracts to automate the verification of educational achievements and certificates.
iii. Integrate the blockchain credentialing system with Ghana's national identification system

9.7 Emerging Tech Pilots and Research Initiatives

The deployment and implementation of AI and emerging technologies in education require rigorous testing to assess their effectiveness and scalability. The pilots ensure that the end users contribute actively and inform adjustments and research directions to address specific sustainability needs. Strategies include:

i.   Launch Innovation Hubs at all levels of education.
ii.   Pilot Augmented Reality/Virtual Reality tools in the delivery of the curriculum
iii. Establish Research-Practice partnerships with universities.
iv.   Conduct small-scale pilots of EdTech in rural schools to create model school.
v.   Utilise learner and teacher feedback to guide EdTech pilot design.
vi.   Create a national repository of EdTech pilot results and case studies.
vii. Embed ethics and inclusion Research in emerging technology pilots.
viii.   Incentivising teacher-led action research on technology integration.

9.8 Key Actions and Strategies

Action/Strategy	Expected Outcome
Develop national guidelines on AI and emerging tech and monitor for fairness and data protection.	Responsible AI and emerging technology use, builds trust, and protects learner privacy and equity.
Create a National Education Data Lake by aggregating data from multiple sources	Enhanced research, planning, and responsive policymaking that benefits teachers and learners alike.
Implement scalable, context-appropriate AI systems for personalized learning and data-driven assessment.	Improved learner engagement and use of real time data to support remediation.
Deploy diagnostic tools and predictive analytics to identify and support at-risk or struggling learners.	Improved learning performance and reduced dropout rates
Provide continuous professional development to help educators interpret and use AI and Machine Learning data effectively.	Improved data-informed instruction and support for differentiated learning.
Develop Learner Profiles and Dashboards and integrate AI and Machine Learning insights into teacher-facing dashboards and learner learner profiles.	Improved personalized teaching strategies, learner reflection and ownership of learning.
Distribute offline-ready, accessible tech solutions and ensure inclusive infrastructure in all schools.	Bridges digital divide
Utilise National Learning Platforms and Machine Learning to analyze learner work at scale and generate actionable feedback.	Reduced teacher workload and timely provision of feedback to learners
Collaborate with data protection and cybersecurity agencies to implement blockchain for certification and records.	Improved credibility, transparency, and portability of learner qualifications.

Set up hubs in Colleges of Education, STEM schools, and rural areas to pilot emerging technologies.	Improved teacher innovation capacity and ability to engage learners through interactive and relevant technology.
Create partnerships with universities and collect learner/teacher input to guide EdTech pilots.	Improved evidence-based practice
Develop a digital repository of EdTech pilot outcomes, case studies, and best practices.	Scale-up of effective strategies and innovative learning

9.9 Action Plan

Action	Timeline	Resources Needed	Responsible
Identify specific needs and gaps of specific AI tools in current educational practices.	2025 - 2026	Survey and data analysis tools, local community liaisons	NITA, MOE, CENDLOS
Secure funding to support the implementation of strategies	2025 - 2026	Partnerships	MoE, DPs
Introduce AI-powered tools in 10 selected classrooms in public, private, SENs and underserved schools each.	2026 - 2028	Funds, technical resources	MoE, NGOs, GES, GTVET
Provide professional development for teachers on AI use and emerging technologies	2027-2028	Trainers	NTC,MoE, NaCCA
Expand the deployment of AI-powered solutions in underserved areas Increase the pilot to more than 50% of schools in the country.	2027 -2030	Partnerships	MOE, MoC, World Bank, UNICEF, PPPs, GoG
Integrate AI tools into the broader curriculum	2026- 2028	Partnership	NaCCa, MOE, NTC
Develop Adaptive Learning paths for learners based on the data received.	2027 -2028	Partnership	CENDLOS, NaCCa,
Involve parents, traditional leaders, educators and learners in understanding and supporting AI use in education.	2028-2030	Communication tools, Partnerships	Parents, MoE, Traditional Leaders,

9.10 Performance Indicators

Indicator	Target	Data Source	Frequency
Percentage of schools utilizing AI in education delivery	65 % of schools using AI in teaching, learning and assessment	EMIS	Annually
Percentage reduction in reported unethical and unfair AI use	85% of AI generated contents meet ethical and fair use guidelines fair across different educational demographics	EMIS (through plagiarism checkers), Institutions	Annually
Percentage of learners with SEN using AI tools	70% adoption of AI by learners with special education needs	EMIS	Annually

9.11 Risk Assessment

Risk	Impact	Likelihood	Mitigation Strategy
Data Privacy and Security Risks	Increased Mistrust which can lead to reluctance in adopting AI for teaching and learning Legal implications	High	Adhere to data protection regulations and standards
Over-reliance on AI and emerging technologies	Reduced psychomotor and critical thinking skill development	High	Balance technology use with traditional teaching methods. Encourage collaborative learning and interactive learning
Unequal access to technology and internet connectivity	Delayed access to interventions and Limited technology integration	High	Improve ICT infrastructure in schools Provide offline solutions that accommodate low bandwidth but with frequent synchronization.
Reliability of AI Systems	Affect the quality of learning outcomes	Medium	Partnership with global EdTech providers/developers
Non-compliance with legal and regulatory requirements on data protection	Legal penalties Loss of credibility	Low	Ensure the usage of AI systems used conform to legal standards.

9.12 Roles and Responsibilities

Role	Responsibility	Expected Contribution
MoE	Develop national policies and strategies for AI-driven inclusive education.	Formulate and oversee inclusive education policies integrating AI.
	Allocate resources and enforce policies supporting digital accessibility.	Enhanced availability of AI-powered localized learning content in Ghanaian languages.
CENDLOS	Implement strategies for AI-driven integration in education	Monitor and evaluate strategies
NaSIA	Monitor and ensure compliance with inclusive education policies	Monitor and evaluate schools' adherence to inclusive policies and technology integration.
MoF	Secure funding for ICT infrastructure development	Allocate budgets for ICT infrastructure expansion in rural areas.
Development Partners (World Bank, UNICEF)	Support in the provision of financial and technical support for digital accessibility in rural areas.	Improved EdTech delivery
NaCCA	Develop and approve AI-driven, accessible learning materials.	AI-powered, adaptive learning systems incorporated into the national curriculum

9.13 Alignment with Other Pillars

i. Requires Infrastructure and Capacity interventions to be successful
ii. Enhances Curriculum and ICT Integration through smart learning tools.
iii. Supports Data Management and Reporting by optimising learner analytics.
iv. Ensures Cybersecurity and Digital Safety and Data Protection by integrating AI-powered security systems to safeguard learning materials, learner, and teacher data.
v. Supports Capacity Building (Training and Support) by equipping educators with AI-powered teaching strategies and accessible digital skills.
vi. Enhances Governance & Management and Administration by implementing AI-powered policies and administrative systems to support inclusive education.

Thematic Area 9: Cybersecurity and Digital Safety

10.1 Vision

Create a safe and secure digital learning environment by protecting learners, teachers, digital devices, parents, guardians, institutions, and other interested stakeholders from cyber threats and digital exploitation.

10.2 Objectives

Number	Objectives
1	To develop national cybersecurity guidelines for the educational institutions to ensure standardization, harmonization, efficient and scalable practices that strengthen institutional resilience.
2	To develop policies on cybersecurity programs for the various educational levels to reduce vulnerabilities among stakeholders
3	To develop a national strategy for the provisioning of cybersecurity solutions across the various institutions and educational levels thereby ensuring a safer learning environment.
4	To ensure compliance with the relevant regulations in the Data Protection Act of Ghana for standardization.
5	To develop a national strategy for the training of skilled personnel towards the delivery of cybersecurity content and ensure uniform dissemination of cybersecurity knowledge across institutions.
6	To equip the identified stakeholders (teachers, digital devices, parents, guardians, institutions and other interested stakeholders) with the digital safety knowledge to protect themselves within cyberspace and promote digital wellbeing for responsible usage of devices and applications.
7	To identify and assess potential online risks targeted at institutional and individual systems and propose mitigation solutions.

10.3 Challenges and Opportunities

Category	Description	Impact/Significance
Challenges		
1	Sector Ministry has no national cybersecurity guideline for educational institutions.	It will create unregulated cyberspace/ Insecure systems for the educational institutions and other relevant agencies
2	Absence of specific cyber policy targeted for educational institution	It will result in unsafe digital learning environments.
3	Inadequate awareness for compliance with the data protection regulations	Creates unsafe digital learning environments

4.	The absence of a national framework for the training of skilled personnel	It will create unsafe digital learning environments and result in significant gaps in workforce readiness and capability across critical sectors
5	Inadequate cybersecurity awareness among the identified stakeholders (teachers, digital devices, parents, guardians, institutions and other interested stakeholders)	It will increase the risk of cyber threats, weaken organisational resilience, and undermine national efforts to ensure a secure digital environment.
6	Inadequate cybersecurity knowledge and expertise among the identified stakeholders (teachers, digital devices, parents, guardians, institutions and other interested stakeholders)	It will hamper timely detection, comprehensive risk assessment, and effective response to emerging online threats. Thereby exposing individuals, institutions, and national systems to increased vulnerabilities, threats and attacks. It exposes individuals, institutions, and national systems to increased vulnerabilities, threats and attacks.
Opportunities		
1	To advocate for and develop a comprehensive national cybersecurity framework tailored for the education sector	It will establish a secure digital learning environment
2	The existence of the Cybersecurity Act 2020 (Act 1038)	It will serve as a background for the establishment of a cybersecurity policy for the education sector
3	To support and guide institutions in developing customized cybersecurity policies that address their unique digital environments	It will enhance institutional capacity to minimize and respond to cyber threats
4	To spearhead the development of a national policy framework that standardizes the procurement, deployment, and management of cybersecurity solutions	It will ensure consistency and effectiveness in cybersecurity practices across sectors

5	To initiate the creation of a national compliance guideline that operationalizes data protection regulations	It will promote consistent and enforceable data protection practices
6	To develop and implement a national capacity-building framework that standardizes training of skilled personnel in cybersecurity	It will create a skilled workforce equipped with employable skills.
7	To design and roll out targeted, inclusive cybersecurity awareness programs that empower all stakeholders with the knowledge and skills needed to foster safe digital practices	It will reduce the risk of cyber threats
8	Cybersecurity awareness campaigns in schools during the national cybersecurity awareness month.	Builds a culture of responsible digital citizenship.
9	Integrate cybersecurity and digital safety education into school curriculums	Reduce online threats Reinforce knowledge acquisition to teachers and provide support to the learners.
10	Utilize CPD platforms (PLCs, teachers' platform) for cybersecurity capacity building among teachers. Encourage the culture of cybersecurity.	Reinforce knowledge acquisition to teacher and provide support to the learner thereby minimising potential harm
11	Develop and train incident response teams within institutions to manage cybersecurity incidence	It will ensure proactive cybersecurity measures and improve the speed, accuracy of threat analysis and detection.
12	To invest in advanced threat analysis and detection technologies and systems	It will improve the speed, accuracy of threat analysis and detection.
13	Utilize CPD platforms (PLCs, teachers' platform) for cybersecurity capacity building among teachers. Encourage the culture of cybersecurity.	Reinforce knowledge acquisition to teachers and provide support to the learners.

| 14 | Potential for Jobs creation | Reduction in youth unemployment |

10.4 Cyber Safety Awareness and Digital Ethics

Awareness of safe online behaviour, understanding of data protection and privacy rules, knowledge of secure communication, and ethical use of digital devices and systems are some indicators of cyber safety awareness and digital ethics. While cyber safety awareness focuses on the practical skills needed to protect individuals from cyber threats and behave safely online, Digital Ethics addresses the moral principles guarding online behaviour on the responsible use of digital technologies.

10.5 Protection Against Online Harassment and Cyberbullying

Protection against online harassment and cyberbullying requires multiple approaches, including education, technology, legal action, and mental health support. By strengthening protection against online harassment, institutions and EdTech providers have a role to play in fostering a culture of awareness, responsibility, and safe utilisation of technological tools.

10.6 Guidelines for Secure Use of EdTech Platforms

Secure usage of EdTech platforms is essential for protecting users' privacy, promoting positive learning experiences, and minimising the risks associated with cyber threats. Adhering to guidelines, institutions can foster a safe, secure, and productive digital learning environment.

10.7 National Cybersecurity Policy for Education Technology

The policy ensures a safe and productive digital learning environment, focusing on issues including data privacy, secure access, cybersecurity education, and digital ethics to safeguard learners, educators, education managers, and institutions.

10.8 Key Actions and Strategies

Action/Strategy	Expected Outcome
To advocate for the ministry and its decentralised bodies to include as a priority the establishment of cybersecurity guidelines in the national education policy.	Coordinated cybersecurity implementation from national to the district levels.
Creating awareness about the importance of cybersecurity, offer guidance and template for developing tailored cybersecurity policies for the various educational levels	Increased knowledge on prevention of cyber threats and harmonized cybersecurity policies.
Develop a comprehensive national policy framework that defines clear guidelines for implementation of cybersecurity solutions Develop a comprehensive cybersecurity framework	Harmonized cybersecurity policies and synchronized cybersecurity solutions. Address data protection, online safety, and responsible technology use

Initiate the development of a national compliance guideline that aligns with existing data protection regulations	Enhanced institutional compliance with data protection laws, improved safeguarding of personal and sensitive information, increased accountability among data handlers, and strengthened public trust in digital and governmental services.
Design and implement a national cybersecurity training framework as well as Integrate cybersecurity and digital safety education into school curriculums.	Enhanced a well-coordinated and competent cybersecurity workforce equipped with standardized skills. Institutionalized cybersecurity training for learners and teachers.
Conduct digital safety training programs for learners and teachers.	Improved knowledge on cybersecurity for learners and teachers.
Develop a national cyber safety curriculum.	Increased awareness and prevention of cyber threats.
Implement strict data protection policies in schools.	Secure digital learning environments.
Design and implement targeted awareness campaigns tailored to each stakeholder group	Increased cybersecurity knowledge and behavioral change among stakeholders
Invest in advanced threat detection systems and establish real-time threat intelligence sharing networks Deploy a range of security measures and solutions to protect educational data and online privacy	Improved early warning capabilities, faster identification and containment of cyber threats to enhance coordination among stakeholders. Enhanced data and systems security

10.9 Action Plan

Action	Timeline	Resources Needed	Responsible
Stakeholder Mapping and Engagement	2025 – 2030	Tech solutions	MoCDTI (its agencies)
Evidence Gathering and Policy Brief Development		Skilled Personnel	PPP (Telcos)
Advocacy and Communication Campaign		Funding	MoF
Drafting and Presentation of Policy Proposals		International cooperation	MoE and its agencies
Capacity Building and Technical Support		Funding	CENDLOS
Awareness Campaign Design and Rollout	2025 – 2030	Tech solutions	MoCDTI (its agencies), PPP, MoF, MoE and its agencies
Development of Resource Materials		Skilled Personnel	
Stakeholder Engagement and Sensitization Workshops		Funding	
Technical Assistance and Policy Drafting Support		International cooperation	
Collaboration with Regulatory and Oversight Bodies		Skilled Personnel	
Conduct a nationwide assessment of existing cybersecurity practices and gaps across sectors.	2025 – 2030	Tech solutions	MoCDTI, CSA JCC
Identify key challenges, resource limitations, and inconsistencies in the procurement and implementation of cybersecurity tools.		Skilled Personnel	Ministry of Education
Convene multi-sectoral forums with stakeholders from government, private sector, academia, and civil society to gather input and build consensus.		Funding	Other relevant MDAs National Accreditation Board (NAB)
Draft guidelines covering key areas, and ensure the framework incorporates risk-based approaches and best practices		International cooperation	Non-Governmental Stakeholders
Legal and Regulatory Review against existing laws		Legal experts, policy analysts, regulatory audit tools	Ministry of Justice & Attorney General's Department, MoCD, Data

			Protection Commission
Stakeholder Mapping and Engagement	2025 – 2030	Tech solutions	MoCDTI (its agencies)
Review of Existing Legal and Regulatory Frameworks		Skilled Personnel	PPP, MoF, MoE
Analyze the Data Protection Act and related policies to extract key compliance obligations.		Legal and policy analysts, regulatory documents, stakeholder workshops	Data Protection Commission, MoCD, MoE
Development of Draft Compliance Guidelines		Technical writers, legal experts, stakeholder review sessions	Data Protection Commission, GES, MoE
Validation and Pilot Implementation		Pilot schools, monitoring tools, M&E consultants	GES, CENDLOS, NITA
Finalization and Official Endorsement		Inter-agency working group, legal advisory committee	MoE, Attorney General's Dept., DPC
Nationwide Dissemination and Training		Training modules, facilitators, regional rollout logistics	MoE, GES, NCCE, CSOs
Establish a Multisectoral Steering Committee to ensure diverse input and coordinated implementation.	2025 – 2030	Tech solutions	MoCDTI (its agencies)
Conduct Needs Assessment and Skills Gap Analysis to inform the development of a framework that responds to actual capacity needs.		Skilled Personnel	PPP

Develop the National Cybersecurity Training Framework to ensure consistency, scalability, and alignment with national cybersecurity priorities and global standards.		Funding	MoF
Curriculum Integration for Basic and Secondary Schools to foster early digital safety awareness and responsible online behavior.		International cooperation	MoE
Teacher Training and Professional Development to identify implementation challenges and opportunities for refinement.		CPD modules, ICT trainers, feedback and evaluation tools	Ministry of Education (MoE), National Teaching Council (NTC), GES
National Rollout and Public Awareness to generate public support and ensure widespread adoption across all regions.		Media campaign funding, outreach facilitators, local language materials	MoE, Ministry of Information, NCCE, CSOs
Situational Analysis and Needs Assessment by conducting a national skills gap analysis to identify existing competencies and shortages in cybersecurity training and content delivery	2025 – 2030	Tech solutions	MoCDTI (its agencies)
Map existing training institutions and programs (universities, TVETs, training centers, etc.) and assess their relevance to cybersecurity needs.	2025 – 2028	Trainers (Teachers) of trainers(learners)	PPP
Engage key stakeholders for inputs and validation.	2025 – 2028	Funding	MoF
Define Strategic Objectives and Goals	2025 – 2028	International cooperation	MoE
Integrate cybersecurity into broader digital literacy programs	2025 – 2028	Curriculum experts, instructional designers, ICT and cybersecurity content	Ministry of Education (MoE), CENDLOS, GES

Localize content to Ghana's cultural, linguistic, and policy context		Language experts, localization teams, policy consultants	MoE, NaCCA, National Languages Centre
Institutional framework and accreditation		Regulatory policy input, QA standards, accreditation tools, advisory board	National Accreditation Board, CTVET, GTEC, MoE
Conduct Needs Assessment by identifying current gaps in cybersecurity knowledge and skills across different sectors and assessing existing training programs and their effectiveness.	2025 – 2030	Tech solutions	MoCDTI (its agencies)
Define Objectives and Scope by determining specific goals for the national strategy (e.g., increasing workforce capacity, standardizing training quality) and defining the scope of training (e.g., target audience, types of cybersecurity skills).	2025 – 2028	Trainers (Teachers) of trainers(learners)	PPP
Conduct stakeholder Engagement by consulting relevant stakeholders and gather input on training needs, curriculum development, and implementation strategies.	2025 – 2028	Funding	MoF
Develop Curriculum and Training Modules by designing comprehensive cybersecurity training modules aligned with established standards and best practices.	2025 – 2028	International cooperation	MoE
Establish training delivery mechanisms	2025 – 2028	Training content, delivery platforms (e.g., LMS), certification frameworks, partnerships with educational institutions	Ministry of Education (MoE), GES, CTVET

Allocate funding and resources for curriculum and infrastructure	2025 – 2028	National and donor funding, instructional materials, qualified trainers, ICT labs	Ministry of Finance (MoF), MoE, CENDLOS
Create timeline and implementation milestones	2025 – 2030	Project planning tools, implementation consultants, M&E frameworks	MoE, Ministry of Communications and Digitalization (MoCD), GES
Launch communication and awareness strategy	2025 – 2026	Digital media content, outreach coordinators, events and campaigns	MoE, NITA, NCCE, Information Services Department
Policy integration and sustainability mechanisms	2025 – 2030	Policy review teams, legal advisors, national cybersecurity standards, inter-ministerial coordination	MoE, MoCD, Data Protection Commission, CSA (Cyber Security Authority)

10.10 Performance Indicators

Indicator	Target	Data Source	Frequency
National cybersecurity guidelines for educational institutions developed and implemented.	Implementation by 2027	Guidelines implemented by GES, TVET, DPC, CSA	Bi-annual (Every 6 months)
Policies on Cyber security programmes developed and enforced	40% of cyber security policy programmes developed and enforced by Year 2. - 60% of EdTech providers comply by Year 3.	Policy adoption reports from MoE, GES, and CSA	Bi-annual (Every 6 months)

Number of learners, teachers, and parents trained with digital safety knowledge	At least 80% of learners, 80% of teachers, and 50% of parents trained by Year 3.	Training reports from GES, MoE, CSA	Quarterly

10.11 Risk Assessment

Risk	Impact	Likelihood	Mitigation Strategy
Unavailability of National cybersecurity guidelines for educational institutions.	Educational institutions will not have coordinated and integrated systems. This can result in increased vulnerability, lack of accountability and responsibility, and legal and financial risks among others.	High	Develop easy-to-use guidelines and toolkits for education institutions and collaborate with EdTech companies and cybersecurity experts to provide capacity-building support.
Low enforcement of policies in developed Cyber security programmes	EdTech providers not complying with cybersecurity policies can lead to loss of trust in educational technology and increased in cybersecurity vulnerabilities.	HIGH	Prioritize strong enforcement and monitoring of cybersecurity policies while investing in capacity building to support this effort.

10.12 Roles and Responsibilities

Role	Responsibility	Expected Contribution
MoE, GES, CSA,	Prioritize strong enforcement and monitoring of cybersecurity policies while investing in capacity building to support this effort.	Strengthen, monitor, and evaluate EdTech providers to comply with cybersecurity policies and invest in capacity building.
MoE, GES, CSA, EdTech Providers (PPPs)	Develop easy-to-use guidelines and toolkits for education institutions and collaborate with EdTech companies and cybersecurity experts to provide capacity-building support.	Enhanced Digital literacy and Integration. Promote safe and secure use of technology and provide capacity building for educators.

10.13 Alignment with Other Pillars

   i.   Links with Infrastructure and Connectivity for secure digital access.

  ii.   Supports Data Protection by ensuring compliance with data privacy laws.

Thematic Area 10: Data Management and Reporting

11.1 Vision

To promote a culture of data-driven and evidence-based reporting for decision-making in education.

11.2 Objectives

Number	Objectives
1	Ensure effective data collection modalities aligned with key educational decision-making priorities
2	Employ efficient data management processes to ensure data accuracy, consistency, and equitable accessibility for educational stakeholders.
3	Adopt secure and reliable data storage solutions that comply with relevant regulations for educational data.
4	Develop strategies for ethical use of data to inform educational policies and practices.
5	Implement a robust monitoring and evaluation framework to assess the quality, impact, and effectiveness of data-driven initiatives in education

11.3 Challenges and Opportunities

Category	Description	Impact/Significance
Challenges		
1	Lack of comprehensive real-time education data reporting systems.	Delays in data collection and analysis can result in slow responses to issues.
2	Delayed processing of data collected.	Data collected loses relevance, problems remain unsolved or a solved not based on the required evidence
3	Limited understanding of indicators	If the research team does not understand how to analyze and apply data, they may fail to make effective decisions.
4	Lack of awareness of data types and storage locations.	Duplication of labour as agencies are not collaborating.
5	Challenges in Data Accessibility	Hinders global visibility, decisions cannot be made at all levels
6	Data Security & Privacy Risks	Data breaches can result in legal consequences, loss of public trust, and ethical concerns.
7	Limited Funding for Data Systems	Data collection remains manual and inefficient.
8	The absence Of AI and ML will hinder data management	Effective and timely education planning and interventions
Opportunities		

1	Availability of different data sources for alignment	One data set validates another.
2	Data literacy and capacity building on, data collection, manipulation, target setting, analysis and utilisation	Insights lead to actionable improvements in the entire education ecosystem.
3	Data governance and ownership	Enhanced stakeholder participation
4	Open Data & Transparency Initiatives	Accessible education data can drive innovation, research, and accountability, fostering evidence-based policy reforms.
5	Data-Driven Funding & Resource Allocation	Governments and donors will allocate resources more effectively by using real-time education data to identify institutions with urgent needs.
6	Increased Stakeholder Collaboration and ownership	Seamless data sharing between government, schools, NGOs, and private sector partners enhances strategic planning and funding decisions.

11.4 Standardized Education Data Collection and Storage

   i. Centralised education data systems ensure that all data are stored in unified databases and cloud-based platforms, allowing seamless integration and accessibility across schools and institutions.
  ii. Standardised data collection protocols with uniform formats, automated validation processes, and clear reporting guidelines are necessary to maintain consistency and accuracy in educational data.
 iii. Data accessibility and security measures, such as role-based access control, encryption, and backup systems, help protect sensitive information while ensuring that authorised users can retrieve the data they need.
  iv. Data analytics and reporting for decision-making using dashboards, benchmarking, and predictive analytics provide insights that support evidence-based policy decisions and educational improvements.
   v. Stakeholder collaboration and capacity building are necessary to enhance data management practices and drive continuous improvement in education systems.

11.5 Digital School Management Systems

 i. Centralised learner and staff records for accurate real-time updates and seamless data sharing.
ii. Real-time attendance and performance tracking to generate reports that help identify learning gaps and improve outcomes.

iii. Efficient resource and financial management will lead to the transparent and effective allocation of school resources.
iv. Enhanced communication and stakeholder engagement are required to improve collaboration and decision-making.
 v. Data-driven decision-making and policy planning are required for continuous improvement in school operations.

11.6 Real-time Data Analytics for Decision Making

i.   Decentralised data collection feeding into the centralised integration system allows for real-time updates and seamless integration and sharing.

ii. Live dashboards for performance monitoring provide dynamic visualizations of key performance indicators (KPIs)

iii. Predictive analytic models can be developed for proactive decision making.

iv. Enhanced resource allocation and operational efficiency at all levels are also required.

v.   Evidence-based policy and strategy development will improve MoE's transparency and efficiency.

11.7 Integration with National Education Management Information Systems (EMIS)

i.   Standardised data collection and data entry protocols for accurate, timely, and reliable reporting.

ii. Real-time data synchronisation is required to reduce delays and ensure seamless data exchange between agencies and other stakeholders.

iii. Data-driven decision-making and policy planning using an aggregated national and institution-based dashboard.

iv. Enhanced collaboration and capacity building among stakeholders to promote open-data policies.

11.8 Key Actions and Strategies

Action/Strategy	Expected Outcome
Develop timelines for data collection that aligns with key decision-making periods and academic sessions Regularly review and update the data collection process based on feedback and results.	Enhanced timely data collection, aggregation and analysis.
Deploy a national education data management system that interacts with institutional databases at the subnational levels.	Streamlined reporting and data analysis.

Develop guidelines on how to store, manage and share educational data	Enhanced protection and access to reliable data.
Establish training programmes and guidelines for data-driven decision-making.	Formulation and implementation of appropriate policy decisions that solve educational challenges
Undertake timely monitoring of EdTech initiatives Regularly review and update strategies to reflect changing educational priorities and challenges Provide regular feedback to refine modalities based EdTech usage	Improve EdTech utilization, performance and educational outcomes.

11.9 Action Plan

Action	Timeline	Resources Needed	Responsible
Design a roadmap for nationwide EdTech data collection specifying data collection processes and locations	2025 - 2030	Personnel Logistics financial	CENDLOS and GES
Form a technical working group to develop guidelines for data management and reporting	2025	Personnel Logistics financial	CENDLOS
Develop manuals on data management and reporting	2025	Personnel Logistics financial	CENDLOS
Conduct training sessions for key decision makers in the education space	2025	Personnel Logistics financial	CENDLOS
Conduct institutional and infrastructural needs assessment across the country	2026	Personnel Logistics financial	CENDLOS and GES, Ghana Statistical Service
Identify and conduct a ToT for regional and district officers on EdTech data management systems: MoE officials, Teachers, Parents	2026	Personnel Logistics financial	MOE, CENDLOS and GES
Deploy EdTech infrastructure at the school, district and regional education offices.	2027	Personnel Logistics financial	MOE, CENDLOS and GES

11.10 Performance Indicators

Indicator	Target	Data Source	Frequency
Number of functional EdTech initiatives monitored	50% of EdTech initiatives monitored	MOE and agencies	Annually
Number of Reviewed and updated strategies that reflect changing educational priorities and challenges	100% review of strategies	MOE and agencies	Every two years
Number of Reports on EdTech implementations	50% of implementations reports	MOE and agencies	Annually
Number of decisions made based on evidence.	100% data driven decision making	MOE, agencies and partners	Annually

11.11 Risk Assessment

Risk	Impact	Likelihood	Mitigation Strategy
Low digital literacy	High	Medium	Develop training resources
Low proactiveness in embracing the use of technology commonly known as BBC	High	Medium	Co-creation of EdTech interventions with end users
Limited expertise in the deployment of EdTech tools	High	Medium	Collaborative engagement between diverse actors for effective deployment of EdTech tools
Inadequate resources	Medium	Medium	Government to partner with Development Partners for the provision of EdTech tools.

11.12 Roles and Responsibilities

Role	Responsibility	Expected Contribution
MoE	Policy formulation and M&E	Established policies for guiding the implementation of data management processes.
GES, CTVET, Ghana TVET Services, CENDLOS and CEA	Policy implementation and adherence	Adherence to implementation of established data management processes.
World Bank and DPs	Technical and financial support	Financial and technical support for the development and implementation of data management processes.

11.13 Alignment with Other Pillars

i. Strengthens Monitoring and Evaluation by improving reporting mechanisms.

ii. Supports AI and Emerging Technologies by leveraging big data analytics.

iii. Governance: Supports accountability and inclusivity by providing transparency regarding EdTech outcomes.

iv. Capacity Building: Helps measure the effectiveness of teacher training and professional development programs.

v. Data Protection.

Thematic Area 11: Data Protection

12.1 Vision

Establish a robust data protection framework that safeguards the personal data of learners and teachers through compliance with national and international data privacy laws while promoting responsible data use in education.

12.2 Objectives

Number	Objectives
1	Ensure all EdTech platforms (mobile, web application and any other element of service delivery) comply with Ghana's Data Protection Act and international standards (e.g., GDPR).
2	Implement strategies for learner and teacher data privacy (Privacy strategy, retention strategy, consent forms, cloud security strategy, information security strategy, and any other related strategies)
3	Develop and implement plans, procedures, and guidelines that govern the collection, usage, storage, disclosing, and sharing of personal data within educational technology space (Principles of Data Protection)
4	Execute technical and organizational measures to protect learners' and teachers' personal data from unauthorized access, breaches, and other security threats (Privacy by design and default)
5	Conduct regular training sessions and awareness campaigns for teachers, learners, and other stakeholders on data protection best practices, rights under the law, and the importance of responsible data handling in educational settings

12.3 Challenges and Opportunities

Category	Description	Impact/Significance
Challenges		
1	Inadequate enforcement mechanisms for data privacy regulations in education.	Potential misuse of learner and other stakeholders' data which leads to privacy violations.
2	Inadequate awareness and understanding of data protection among school administrators and teachers.	Increased vulnerability to data breaches, cyber threats and potential attacks.
3	Draft National data governance framework yet to be implemented. Many educational institutions may lack formal data governance frameworks or enforcement mechanisms	Establishing clear governance structures will improve accountability in handling learners', teachers' and other stakeholders' personal data.

4	Resistance to policy adoption. Teachers, administrators, and learners may resist changes due to unfamiliarity with data protection regulations.	Low uptake, and adherence to policy regulations on data protection standards will lead to inconsistency in data handling across institutions resulting in increased risks of legal litigations
5	Inconsistent data management practices resulting from the different schools deploying varied EdTech platforms and approaches.	Not adhering to standardization of the platforms deployment across schools may lead to fragmentation of data.
6	Insufficient training on how to handle processing of personal information for people with special learning needs	Regulations to help prevent discriminations against learners with special learning needs
Opportunities		
7	Leverage best practices from global EdTech regulations to create a strong data protection framework.	Ghana's education system strengthened to meet international data security standards.
8	Adoption of a Comprehensive Data Governance framework that will create a structured framework for managing personal data securely	A well-defined data governance structure will improve institutional credibility and enhance partnerships with stakeholders.
9	Enhanced Data Security Measures to drive the use of encryption, multi-factor authentication, and secure cloud storage.	Strengthened security measures for reducing cyber threats to ensure safe digital learning environments.
10	User Awareness and Training programs on data protection to improve learners' and teachers' understanding of online safety and cybersecurity.	It will increase digital literacy by empowering learners and educators on their rights and responsibilities to protect their personal data/assert themselves
	Develop a data repository for research, to enable policy makers formulate policies, plan, and focus trends and patterns for national development.	Enhanced decision-making processes of policy makers.

12.4 Compliance with National and International Data Protection Laws

Compliance with national data protection laws is critical for ensuring that educational institutions, EdTech platforms, EdTech providers, and other stakeholders adhere to legal frameworks that protect personal data, ensure the legitimate use of data, and ensure the privacy and security of individuals' personal information. Institutions must implement robust security measures to protect personal data from breaches and cyberattacks. By implementing clear data protection policies,

educating stakeholders, ensuring secure handling of personal data, and collaborating with educational institutions, they can ensure that they meet legal obligations and protect the privacy and rights of learners, parents, and educators. This not only helps avoid legal repercussions but also builds trust and confidence among users, fostering a secure and innovative educational ecosystem that benefits all stakeholders.

12.5 Stakeholders Privacy Rights

The privacy rights of learners and teachers are essential components of secure and ethical educational systems. Institutions and EdTech providers must comply with Ghana's Data Protection Act of 2012 to ensure the lawful collection, use, and protection of personal data. This includes obtaining informed consent, minimal processing, providing access and correction rights, ensuring data security, and safeguarding against breaches. By upholding these privacy rights, institutions can foster trust, reduce the risk of data misuse, and provide a secure learning environment for all stakeholders.

12.6 Secure Digital Identity Systems

A secure digital identity system is foundational for protecting individuals' personal data in digital environments. For educational institutions or EdTech platforms, implementing a secure digital identity system is essential for safeguarding the privacy and security of learners, educators, and education managers. By combining advanced authentication and verification methods, data encryption, and role-based access controls, educational institutions and EdTech platforms can create a secure, user-friendly system that maintains the privacy, security, and trust of all users.

12.7 Ethical Considerations in Data Usage

Ethical considerations in data usage are essential for ensuring that data are collected, stored, processed, and shared in a manner that respects individual rights and promotes fairness. Handling data responsibly is critical for ensuring transparency and maintaining the trust of stakeholders. This is crucial to ensure the clear and concise use of language for obtaining explicit consent. Ethical considerations also ensure accountability, data subject rights, data minimality, purpose limitation, data breach notification, and data accuracy.

12.8 Key Actions and Strategies

Action/Strategy	Expected Outcome
Develop and enforce national data protection guidelines for EdTech providers and institutions e.g. DPIA	To regulate the compliance requirements for all EdTech providers and institutions
Conduct awareness and training programs for learners, teachers, and school administrators on data privacy and protection.	Improved understanding and responsible handling of personal information. For data subjects to know and assert their rights under the Act
Implement secure digital identity systems for learners and teachers.	Reduced identity fraud and enhances security in digital education platforms.
Require EdTech providers to routinely be audited by the data protection commission	Enhanced compliance and monitoring of continuous improvement in data security.

Implementation of a Centralized Data Protection Policy for Educational Institutions	Increased compliance with data privacy regulations and reduced legal risks for educational institutions, improve trust among stakeholders in digital learning platforms, and standardize data protection measures across the education sector to ensure consistency in data management.
Conduct regular data protection capacity building and training all stakeholders Integrate digital literacy and data protection modules into school curricula to enhance awareness from an early age Collaborate with relevant stakeholders and deliver targeted training sessions.	Enhanced digital literacy among learners and educators, reduced human error-related data breaches and strengthened culture of data responsibility, where all stakeholders actively participate in safeguarding personal information.
Implementing adequate security Infrastructure in Educational Institutions by deploying advanced data protection security measures, establish data breach response mechanisms to detect, report, and mitigate cybersecurity incidents efficiently and partner with cybersecurity authority and technology providers to offer affordable security solutions for educational institutions.	Reduce risk of data breaches and cyberattacks in schools and EdTech platforms, increased adoption of secure digital learning tools that align better with international best practices.

12.9 Action Plan

Action	Timeline	Resources Needed	Responsible
Implementation of a Centralized Data Protection Policy	2025-2027	Legal & policy experts - Consultation & workshops - Compliance monitoring tools	Data Protection Commission (DPC) Cyber Security Authority (CSA), - Ministry of Education (MoE) - Ghana Education Service (GES), Attorney General's Office

Develop a digital literacy curriculum with a focus on data protection, organize training & workshops for learners, teachers, and administrators and create online resources & toolkits for continuous learning.	2025-2028	Training modules - Experts in cybersecurity & data privacy - Online learning platforms	Ministry of Education (MoE) - Ghana Education Service (GES) -Data Protection Commission - Cyber Security Authority (CSA) - EdTech Companies & NGOs
Assess current cybersecurity readiness in schools deploy data protection measures, establish incident response teams for threats in educational systems and secure partnerships with relevant organisations' for security solutions.	2025-2030	Cybersecurity tools - IT security and data protection experts - Funding & partnerships	- Cyber Security Authority (CSA) - Ghana Data Protection Commission (DPC) - Ghana Education Service (GES) - Private sector & EdTech firms

12.10 Performance Indicators

Indicator	Target	Data Source	Frequency
The number of educational institutions adopting the data protection policy among schools and EdTech providers**.	40% of schools adopt the policy by Year 2. - 60% of EdTech providers comply by Year 3.	Policy adoption reports from MoE, GES, DPC, CSA - Compliance audits from DPC & CSA	Bi-annual (Every 6 months)
Implementation of a Centralized Data Protection Policy	50% of implementation by 2027	DPC & CSA	Bi-annual (Every 6 months)
Number of educators, learners, and administrators trained in data protection and cybersecurity and percentage of schools integrating digital literacy and data protection into their curriculum	At least 60% of learners and 60% of teachers trained by Year 3. - 60% of schools include digital literacy in their curriculum by Year 3.	Training reports from GES, MoE, DPC, CSA - School curriculum reviews from MoE & GES	Quarterly

Number of schools with cybersecurity technologies implemented (e.g., encryption, multi-factor authentication, secure cloud storage).	At least 70% of public and private schools implement cybersecurity measures by Year 3.	IT security assessment reports from CSA, MoE, EdTech partners	Quarterly
Number of cybersecurity incidents reported in educational institutions	50% reduction in cybersecurity incidents in schools by Year 3	- Cybersecurity incident reports from CSA & DPC	Annual Cybersecurity Audit

12.11 Risk Assessment

Risk	Impact	Likelihood	Mitigation Strategy
Low Adoption of Data Protection Policy by Schools & EdTech Providers	Schools and EdTech platforms fail to comply with the Ghana Data Protection Act 2012, which can lead to legal risks and data breaches.	Medium	Conduct extensive awareness campaigns for schools and EdTech providers. By providing compliance incentives such as technical support and certification for compliant institutions. - Strengthen enforcement mechanisms through audits and penalties
Limited Technical Capacity of Educators & School Administrators	Teachers and school administrators lack the skills to implement and enforce data protection measures.	High	Provide ongoing digital literacy training for educators, develop easy-to-use guidelines and toolkits for schools, collaborate with EdTech companies and cybersecurity experts to provide capacity-building support.
Inadequate Cybersecurity Infrastructure in Schools	Schools remain vulnerable to cyberattacks, data breaches, and unauthorized access to personal data.	High	Secure government and private sector funding to support cybersecurity upgrades, encourage cloud-based security solutions with encryption for schools and establish minimum cybersecurity standards for educational institutions.

12.12 Roles and Responsibilities

Responsible Institution	Role and Responsibility	Expected Contribution
CSA, GTEC, NACCA, MoE and DPC	Develop and implement cybersecurity policies for the education sector. - Conduct cyber risk assessments for schools and EdTech platforms, provide guidance and best practices for securing digital learning tools, collaborate with the Data Protection Commission (DPC) for compliance monitoring.	Strengthened cyber resilience in educational institutions, reduced cyber threats and data breaches in schools and enhanced national cybersecurity awareness for learners and teachers.
DPC	Ensure compliance with Data Protection Act, conduct data protection audits and enforcement actions in schools and EdTech companies and provide training and guidance on responsible data collection and processing Create awareness on the rights of data subjects	Increased compliance with data privacy laws, reduced unauthorized access to learners' and teachers' personal data and ensured stronger enforcement of data protection regulations.
MoE	Develop and enforce data protection policies for educational institutions, oversee the integration of digital literacy and cybersecurity education in school curricula, allocate funding for cybersecurity infrastructure in schools.	Nationwide adoption of data protection policies in schools, increased budget allocation for cybersecurity measures, more digitally literate learners and educators.
EDTECH Companies and service providers	Ensure compliance with the Data Protection Act Ensure data privacy by default and design in learning platforms and applications, implement strong security measures, provide technical support and security training on the scope of processing for schools. Establish a data protection policy in all agreements signed Establish data processing agreements	More secure and privacy-compliant digital learning platforms, reduced cybersecurity risks for learners and educators and stronger partnerships between private sector and educational institutions.

12.13 Alignment with Other Pillars

i. Cybersecurity and Digital Safety: Ensures that learner and teacher data are protected from breaches and unauthorised access.

ii. Data Management and Reporting: Establishes secure frameworks for collecting and storing educational data.

iii. Monitoring and Evaluation: Compliance checks are implemented to ensure adherence to data protection laws.

Thematic Area 12: Experiential Learning and Innovations

14.1 Vision

Bridging the gap between educational institutions and industry by implementing government policies that provide tax incentives for industry-aligned internships and workplace experience learning (WEL), ensuring learners gain hands-on practical experience and problem-solving skills to promote innovation, employability, and entrepreneurship among learners through the establishment of innovation centres and business incubators.

14.2 Objectives

Number	Objectives
1	Develop structured experiential learning programs at all levels that integrate academic knowledge with industry practice and real-life experience.
2	Strengthen partnerships between educational institutions and industry to enhance internship/workplace and real-life experience including virtual and simulated learning opportunities.
3	Provide equal access to training, internship/workplace experience including virtual and simulated learning opportunities for all learners, focusing on gender, underserved communities and especially abled persons through scholarships, transportation support, or digital platforms.
4	Enhance critical competencies and skills that are in demand in the job market, including proficiency in AI, data analytics, cybersecurity, software development including coding, networking, hardware and other tech related areas.
5	Create mentorship initiatives that pair learners with industry professionals, facilitators and experiential liaison officers to provide guidance, support and network opportunities that enhance the learning experience.
6	Establish and promote innovation hubs, labs at schools and learning centers where learners can work on real-world projects through incubations, hackathons, research and marketing technologies to address local challenges.
7	Promote partnership between government, training institutions and private sectors to set up business incubators to enhance the process of innovation and entrepreneurship skills, factory production, process management, firm leadership and structure, and business management.
8	Institute measures to accommodate and incentivise industry professionals to share their practical knowledge with learners e.g. tax relief.

14.3 Challenges and Opportunities

Category	Description	Impact/Significance
Challenges		
1	Inadequate collaboration between industries and educational institutions in experiential learning.	Learners graduate with minimal practical skills, reducing immediate employability.
2	Insufficient internship opportunities for learners.	Limits exposure to industry practices and professional work environments.
3	Inadequate infrastructure for learners' and facilitators' professional development	Inadequate facilities and resources may hinder the quality of training, internship and real-life experiences provided.
4	Unequal access to experiential learning opportunities for all learners	Disparities in skills acquisition and experiential development, particularly for learners from underserved communities, leading to workforce inequality.
5	Insufficient Mentorship	Learners may struggle to gain practical and real-life experiences and guidance, affecting their personal and professional growth
6	Insufficient Funding and Resources	Constraints on budget and resources may limit the number of internship placements and training programs available
7	Employer unwillingness to Invest	Industries may be hesitant to invest in training and internship programs without seeing immediate returns.
8	Inadequate supervision and follow ups on learners at industry and real-life experience.	Inability of industrial liaison officers and supervisors in the institutions to monitor learner's and real-life activities.
9	Unwillingness of industry to accept learners due to risk	Industries may not accept learners due to high risk of accident at the workplace without insurance cover
10	Inadequate understanding of workplace experience learning by learners and parents	Unwillingness of parents to sponsor leads to low participation of learners towards Workplace Experience and Learning (WEL).

11	Unfavorable policy environment (limited incentives, lack of partnerships and active match making between learners and industries)	Lack of relevant industry skills among learners. Lack of motivation for industry to absorb learners. Hinder learners' employability and preparedness for the job market. Limited innovations by the industry players. Impact economic growth negatively.
12	Minimal awareness and limited compliance with government policy on learner-employer welfare and protection during internships	Unwillingness of employers to accept interns for the fear of risks of accidents and other workplace hazards with no insurance policy.
13	Difficulty in conducting WEL activities (monitoring, data collection, data collation and analysis) and limited WEL period Inadequate resources due to unavailability of training capacity and materials in their institutions	Limited resources and tools for the execution of WEL activities; and minimal consideration of WEL in certification Insufficient time for learners in industry Industry refusal to accept learners due to limited duration. Inability of learners to match up with robust industry activities.
14	Inadequate standards, guidance and compliance on trade areas	Inconsistencies in the administration of WEL activities
16	Bulky documentation for WEL activities and lack of digital technology in WEL data collection	Industry providers/players refuse to accept WEL documentation and in many cases are unable to print bulky documents
17	High cost of internship due to illegal fees charged by some industries before accepting learners	Learners not being placed due to cost/charges from industry
Opportunities		
1	Expanding public-private partnerships for real life experiences and innovation programs.	Enhances learners' employability and promotes industry-driven innovation and play-based learning.
2	Leveraging digital platforms for virtual experiences and innovation competitions.	Provides flexible learning opportunities and expands access to industry expertise.

3	Initiatives for skills development (YEA, Youth Employment Authority)	Increased competencies in emerging technologies such as AI, data analytics, networking, software development, coding, and cybersecurity to enhance learners' marketability and entrepreneurial skills.
4	Collaborating with local and international industries for internship and training programs	Provides learners with practical experiences, network building, and real-world insights into the tech industry.
5	Organizing events for learners to develop innovative tech solutions within a limited timeframe.	Fosters teamwork, rapid prototyping, hackathons that can lead to the development of viable startups or projects.
6	Creating innovation labs for hands-on projects and problem-solving activities.	Encourages critical thinking, creativity, and application of theoretical knowledge to practical challenges
7	Setting up of business incubators to enhance the process of innovation and entrepreneurial skills	Industry ready workforce with the requisite skills. Reduction in unemployed citizenry. Potential exportation of skilled workforce Opportunities for business start-ups, increase entrepreneurship, and innovation
8	Educational and Industrial partnership to foster Projects-based learning approach into curricula	Learners acquire relevant skills in industry through internship/workplace experiences. Institutions' facilitators get abreast with current industry trends and emerging technologies. Opportunities for facilitators in industry through internships and collaborations through Research and Development (R&D) projects. Accelerate industry growth and improve educational curriculum.

| 9 | Establish favorable and personal tax relief to incentivize, for industry players and professionals to share their practical knowledge with learners | Learners and facilitators acquire industry relevant through industry experts and internships.

Less training cost for industries for newly employed staff.

Ready employable workforce with relevant industry skills set. Accelerate industry growth and enrich educational curriculum. |

14.4 Accreditation and Certification for Experiential Learning

Accreditation and certification of experiential learning can enhance the educational experience of learners in the fields of AI and other technologies. Implementing a robust accreditation system will not only validate the learning outcomes associated with experiential learning but also ensure that these experiences meet the quality standards. Below is a proposed framework for developing an Accreditation and Certification Program for Experiential Learning.

14.4.1 Focus

i. formally recognised and validated experiential learning experiences.
ii. ensure a consistent standard of quality in experiential learning programs.
iii. enhances employability by providing learners with accredited skill-building credentials.
iv. foster collaboration between educational institutions, industry partners, and community organisations.
v. encourages lifelong learning through the recognition of skills gained outside traditional academic settings.

14.4.2 Key Components of the Framework

Component	Description
Accreditation Criteria	Develop clear criteria that experiential learning programs must meet, including learning outcomes, relevance to industry and quality of mentorship.
Certification Levels	Create different levels of certification from Basic, Intermediate to Advanced based on the complexity of the experiential learning activities.
Training for Evaluators	Train evaluators and assessors on how to assess experiential learning programs based on the established criteria and learning outcomes.

Partnerships with Industry	Collaborate with industry leaders and professional associations to ensure the accreditation process is aligned with market needs and technological advancements.
Quality Assurance Framework	Establish a quality assurance process that includes continuous monitoring and evaluation of accredited programs to ensure ongoing improvement and relevance.
Recognition of Prior Learning (RPL)	Implement an RPL process to assess and validate prior experiential learning for individuals who may not have formal qualifications. This will allow learners to gain credits towards their qualifications.
Digital Certification System	Create a digital platform for issuing and verifying certifications that can be easily shared with potential employers.

14.4.3 Implementation steps

i. Stakeholder Engagement: Engage with stakeholders, including educational institutions, industry partners, and government agencies, to provide input and support the accreditation process.

ii. Develop Accreditation Standards: Create detailed guidelines outlining the criteria for accreditation, including the specific competencies and skills expected from experiential learning opportunities.

iii. Pilot Programs: Start pilot programs in selected institutions to test the accreditation framework, gather feedback, and make necessary adjustments before wider implementation.

iv. Training Programs for Facilitators, Internal verifiers, and external verifiers: Develop and offer training programs for facilitators and industry professionals who will conduct assessments and mentorship within experiential learning programs.

v. Marketing and Awareness Campaign: Promote the benefits of accreditation and certification for experiential learning among learners, facilitators, and employers to increase engagement and participation in the program.

vi. Establish an Oversight Committee: Form an oversight committee consisting of representatives from educational institutions, industries, and the government to ensure transparency and accountability in the accreditation process.

14.4.4 Expected Outcomes

i. Increased Credibility: The accreditation will provide official recognition of the value of experiential learning, enhancing the credibility of educational programs.

ii. Improved Job Readiness: Learners will emerge from programs with validated skills and competencies that are aligned with industry needs, improving their employability.

iii. Consistency in Quality: Standardised criteria for accrediting experiential learning will ensure consistent quality of education across institutions.

iv. Strengthened Industry Links: Closer collaboration between educational institutions and industry will lead to more tailored education that meets current technological requirements.

14.5 National Digital Skills Development Strategy

To bridge the digital skills gap and prepare learners for AI and emerging technologies, a National Digital Skills Development Strategy should be implemented with the following pillars:

14.5.1 Curriculum Integration

i. Embed digital literacy, AI, and data science into national education curricula.

ii. Introduce coding, cybersecurity, and cloud computing at primary, secondary, and tertiary levels.

14.5.2 Upskilling & Reskilling Programs

i. Government-funded boot camps and online courses for professionals transitioning into technology roles.

ii. Partnerships with platforms such as Coursera, Udacity, and local EdTech providers.

14.5.3 Digital Inclusion Initiatives

i. Expand internet access and provide low-cost devices to underserved communities.

ii. Establish community digital hubs for hands-on training purposes.

14.5.4 Monitoring & Evaluation

Periodic digital skills audits to track progress and adjust programs based on labour market needs.

14.6 Policy and Legal Framework for Internship and Innovation Programs

A structured policy framework ensures quality and accessibility of the services.

i. Mandatory Internship Placements: Legislation requiring companies (especially in technology) to allocate a percentage of roles for learner internships/WEL. Coordination with appropriate Expertise and adequate resources support to learners and employers throughout the WEL programme

ii. Tax Incentives: For firms that sponsor innovation labs or take on interns.

iii. Documentation: Documentation must be firmly attached to WEL to clearly identify and document learning outcomes for learners with accredited programmes which are linked to qualifications to demonstrate competence according to acceptable industry standards matches learners' skills and interests with the structured training thoroughly prepares learners, facilitators and business/industry to clearly understand the expectations and outcomes of the WEL programme

iv. Occupational Health and Safety: Learners are protected from moral and physical danger, occupational and environmental health, and safety. Formulate legal policy framework on health and safety

v. Exploitation/abuse: learners must not be exploited by being continuously engaged in a production or service capacity, or being used to substitute for the employment of workers and the payment of appropriate wages

14.7   National Coordination and Industry Partnerships

The National Policy Framework on Workplace Experience Learning is as follows:

i. Establish national EdTech strategies for workplace experience learning to align with industry and institutional needs to meet broader educational goals.

i. Promote standardization, equity and inclusiveness on WEL issues in institutions, industry, learners and other stakeholders in ensuring consistency in WEL policies and practices

ii. Establish stronger collaborations with government, industry, institutions to improve skills of learners for knowledge sharing

iii. Develop national policy and guidelines for industry, learners, institutions and other stakeholders on WEL

iv. Partner with all relevant stakeholders in knowledge transfer in skills delivery integrating EdTech solutions

v. Establish national council, associations or boards to coordinate to ensure sustainability of WEL activities

vi. Build digital infrastructure

vii. Develop competency standards, assessment guidelines and national qualifications form the fundamental components of training packages

14.8 Funding and Investment in Innovation Hubs

Funding could be government, private public partnership, institutions, industry, MasterCraft persons, development partners

14.9 Industry-Academia Collaboration Framework
  i.   Engage mentors to serve as role models
  ii. Engage the industrial liaison officers
  iii. Mandatory facilitators engagement with industry during vacation to improve skill delivery
  iv. Curriculum development - Content creation with edtech solutions (simulations, V/R, AR, AI)
  v.   Industry supervisors provide hands-on learning opportunities to learners
  vi. Provision of employability
  vii. Improve curriculum to meet market needs
  viii.   Improve pedagogical skills
  ix. Research and innovation solutions for incubation hubs
  x.   Improve infrastructural development
  xi. Build capacity of facilitators, industrial liaison officers, learners, and other relevant stakeholders.
  xii. Monitoring and evaluation measure with edtech solutions

14.10 Public-Private Partnerships for Scaling EdTech Initiatives
  i.   Initiate public and private experts on mobilising resources for EdTech initiatives.
  ii. Conduct research and innovation on edtech solutions
  iii. Increase funding on edtech solutions
  iv. Promote AI and emerging technologies
  v.   Ensure effective governance on edtech initiatives
  vi. Improve digital infrastructural development

14.10.1 Create Supportive Policy Frameworks

  i.   Develop clear PPP policies specifically for the education technology sector
  ii. Establish regulatory frameworks that protect data privacy while enabling innovation
  iii. Create tax incentives for private companies investing in educational technology
  iv. Implement streamlined procurement processes to facilitate private sector participation

14.10.2 Build Institutional Capacity

  i.   Create dedicated PPP units within education ministries with EdTech expertise
  ii. Train government officials on EdTech partnership management and evaluation
  iii. Develop standardized templates for PPP agreements in the EdTech space
  iv. Establish centers of excellence to document and share best practices

14.10.3 Design Sustainable Financing Models

  i.   Create blended financing mechanisms combining government, private, and donor funding
  ii. Establish EdTech innovation funds with matching contributions from public and private sectors
  iii. Develop outcome-based financing models where payments are linked to measurable educational improvements

iv. Design tiered pricing models to ensure accessibility while maintaining commercial viability

14.10.4 Foster Collaborative Innovation

i. Host regular EdTech stakeholder forums bringing together policymakers, educators, and technology providers
ii. Establish innovation labs where solutions can be co-created and tested
iii. Create accelerator programs focused specifically on education technology
iv. Develop shared research agendas to address key educational challenges

14.10.5 Focus on Equitable Access and Inclusion

i. Prioritize partnerships that address digital divides and reach marginalized populations
ii. Develop infrastructure sharing agreements to extend connectivity to underserved areas
iii. Create subsidized pricing models for low-income communities
iv. Design solutions that work in low-connectivity environments

14.10.6 Build Trust through Transparency and Accountability

i. Establish clear metrics and KPIs for measuring partnership success
ii. Implement regular evaluation processes with results made publicly available
iii. Create multi-stakeholder governance structures that include educator and community voices
iv. Develop transparent procurement processes that prevent conflicts of interest

14.10.7 Prioritize Teacher Support and Engagement

i. Include teacher training components in all EdTech partnerships
ii. Create teacher feedback mechanisms to continuously improve solutions
iii. Engage teacher associations as key stakeholders in partnership design
iv. Establish teacher innovation networks to identify needs and test solutions

14.10.8 Ensure Local Relevance and Contextual Fit

i. Conduct thorough needs assessments before launching partnerships
ii. Adapt global technologies to local curricula and contexts
iii. Develop localized content in relevant languages
iv. Create pathways for local EdTech entrepreneurs to participate in partnerships

14.12 Action Plan

Action	Timeline	Resources Needed	Responsible
Develop standardized internship programs with industry stakeholders	2025 – 2026	Internship policy framework, technology industry experts, academic coordination teams	MoE, Industry Associations
Establish innovation hubs and incubators within academic institutions	2025 – 2026	Funding, lab infrastructure, university partnerships, tech mentors	MoE, CENDLOS
Implement mentorship and career guidance programs	2025 – 2026	Trained mentors, learner counselors	MoE and Ministry of Youth Development and Empowerment, Private Sector Mentorship Networks
Promote research and development collaborations between universities and industries	2025 - 2027	R&D grants	MoE
Design and implement digital teacher training programs	2025 - 2027	Digital tools, training content, certified trainers	MoE, CENDLOS, NTC
Roll out national mentorship campaign in schools and universities	2025 – 2026	Trained mentors	MoE,
Create innovation fund	2026	Government & donor funding, grant management system, governance framework	MoF, MoE, DPs

14.11 Key Actions and Strategies

Action/Strategy	Expected Outcome
Develop standardized internship programs with industry stakeholders.	Improved industry exposure and job readiness for learners.
Establish innovation hubs and incubators within educational institutions.	Entrepreneurship and practical problem-solving skills improved among learners.
Implement mentorship and career guidance programs in educational institutions.	Support learner career development and industry integration.

Promote research and develop collaborations between educational institutions and industries.	Drive innovation and ensure experiential learning and curricula remain relevant in industry.
Digital teacher training	Improved educator capacity in AI and digital pedagogy
Institute an effective digital monitoring system for trainees in industry experiential learning.	Build an effective digitized system for monitoring the performance of learners (WEL) in industry
Develop facilitators skills through workplace experience learning in industry	Capacities of facilitators in terms of pedagogy, technology and ability to deliver hands-on activities built
Review the national WEL policy	Improved WEL processes, standards and reporting
Sensitize industry on the need to accept WEL as a component of TVET training in Ghana.	Acceptance of learners on WEL activities in industry.
Sensitize industry on WEL programme and benefit in government policy	Increased employability of learners in industry after training. Awareness of beneficial policies to industry players
Organize orientation for stakeholders on WEL programme	Improved stakeholders' participation
Ensure dedicated budget and development partner funding for WEL activities	Improved training and performance of Industrial Liaison Officers, principals, regional officers, facilitators and learners
Involve industry players in the development of TVET curriculum	Improved curriculum standards
Establish linkages and collaborations with industries in providing internship programmes for facilitators in the institutions	Effective teaching and learning activities
Develop a tracking system on learners in the industry	Improved monitoring, evaluation and reporting system

14.13 Performance Indicators

Indicator	Target	Data Source	Frequency
20% of universities implementing standardized internship programs	60% by 2027	Ministry of Education reports, university compliance data	Annual
Number of operational innovation hubs in academic institutions	60 hubs by 2026	Accredited Universities reports	Quarterly
Percentage of learners with access to career mentorship programs	70% by 2027	School reports, survey data	Annual
Number of joint R&D projects between academia and industry	80 projects per year	Research councils, university-industry portals	Annual
Percentage of teachers trained in digital and emerging tech pedagogy	75% by 2026	Teacher training institutes, MOE training logs, CENDLOS training logs	Annual
Number of mentors onboarded and matched with learners	50,000 mentors by 2026	Mentorship platform reports	Bi-Annual
Number of startups, R&D projects, or institutions supported by the fund	500 funded initiatives (e.g., startups, university labs, public-private research projects) by 2027	Innovation Fund Report, grant management system, partner institution reports	Bi-Annual
Percentage of funded projects that reach commercialization or measurable societal impact	40% of projects showing validated outcomes (e.g., revenue, employment, patents, social impact) by 2028	Project impact reports, evaluation studies, monitoring dashboards	Annual
Employer satisfaction with internship and certification programs	85% satisfaction rate by 2029	Employer surveys, industry feedback forums	Annual

14.14 Risk Assessment

Risk	Impact	Likelihood	Mitigation Strategy
Low employer/industry participation	High	Medium	Incentivize through tax breaks and employer recognition
Skills mismatch with labour market	High	High	Regular market analysis and curriculum updates
Inequity in access to digital tools	High	High	Subsidized device programs and rural infrastructure investments, PPPs
Resistance to accreditation reforms	Medium	Medium	Stakeholder education and phased implementation
Lack of qualified assessors	Medium	High	Invest in continuous training and certification of facilitators
Existing curriculum lags industry demands expectation and specifications	High	Medium	Frequent curriculum review involving industry players and collaboration with industry on institutional boards and in skills delivery

14.15 Roles and Responsibilities

Role	Responsibility	Expected Contribution
Government	Policy formation, funding, regulation, national coordination	Drive strategy, ensure equity, and monitor implementation
Private Sector	Offer internships, training, innovation support	Provide expertise, resources, and placement opportunities
Educational Institutions	Integrate experiential learning, provide 21st Century training and skills	Prepare learners, evaluate learning, host innovation hubs
Tech Startups & Innovation Hubs	Mentor learners, support incubation	Foster innovation and entrepreneurial skills
Civil Society	Advocate for inclusion, support grassroots training	Promote digital access and social equity
Development Partners (World Bank, UNICEF, UNESCO, etc.)	Technical and financial assistance	Support innovation, research, and education systems strengthening
Industry Partners	Shape curriculum, co-develop training programs	Ensure alignment with evolving industry needs
Community Organisations	Provide local access, mentorship, and digital literacy programs	Increase grassroots participation and retention

Parents and guardians	Understand the concept of the WEL programme	Encourage and support learners on WEL activities
Training providers	Provide integration of activities between the learner, training providers and industry	WEL programme improved for upskilling
Industry players	Provide opportunities for learners to engage in industry experience	Improve learners' skills delivery
Learners	Acquire hands-on training in their respective trade areas in the industry during WEL by practising what they have learnt in the institutions	Improve practical exposure and competencies and improve understanding of the work environment and employers' expectation

14.16 Alignment with Other Pillars

    i. Governance & Management and Administration

    ii. Experiential learning requires strong governance structures to create policies that support hands-on education and industry collaboration. Effective administration ensures coordination between educational institutions and industries for practical learning opportunities.

    iii. Infrastructure and Connectivity & Localized Content Creation

    iv. Digital infrastructure, such as laboratories, virtual reality, and simulation environments, enhances experiential learning. Localised content ensures that practical experiences align with industry needs and local challenges, thereby making learning more relevant.

    v. Capacity Building (Training and Support) & Curriculum and ICT Integration

    vi. Training educators in innovative teaching and facilitating methods fosters experiential learning. Integrating ICT into the curriculum equips learners with real-world digital skills and enhances their readiness for internships and industry applications.

    vii. Inclusivity and Accessibility & AI and Emerging Technologies

    viii. Experiential learning should be accessible to all learners, including those with special needs. AI-driven simulations, virtual internships, and emerging technologies bridge accessibility gaps and expand innovative learning experiences for students.

    ix. Cybersecurity and Digital Safety & Data Protection

    x. As learners engage in digital internships and industry-linked projects, cybersecurity ensures their safe participation. Protecting data from experiential learning platforms maintains learners' privacy and educational integrity.

    xi. Data Management and Reporting & Monitoring and Evaluation

    xii. Tracking learners' hands-on learning experiences, internships, and innovations ensures a measurable impact. Data-driven decision-making refines experiential learning strategies to achieve continuous improvement.

Thematic Area 13: Monitoring and Evaluation

15.1 Vision

Promote a comprehensive monitoring and evaluation (M&E) framework to assess the impact of EdTech initiatives.

15.2 Objectives

Objective Number	Objective Description
1	Develop a standardized M&E framework for tracking EdTech adoption and impact with the Education Strategic Plan.
2	Establish Key Performance Indicators (KPIs) for assessing the effectiveness of EdTech programmes.
3	Establish feedback mechanisms for improving the implementation of Edtech strategies
4	Improve institutional and technical capacities of existing governance structures for the implementation of the M&E framework.
5	Allocate adequate and sustainable financial and technological resources to support the effective implementation of the M&E framework.

15.3 Challenges and Opportunities

Category	Description	Impact/Significance
Challenges		
1	Lack of a comprehensive M&E framework covering EdTech.	Low accountability of implementation of EdTech initiatives.
2	Different stakeholders may have varying interpretations of key indicators leading to inconsistent data collection.	Inconsistent data hinders accurate comparisons and analysis, making it difficult to assess overall effectiveness.
3	Educational data may be scattered across disparate systems, making it difficult to integrate and analyze.	Fragmented data limits the ability to gain a holistic view of EdTech's impact.
4	EdTech evolves quickly	The framework needs to be adaptable to the evolving technology systems. Outdated frameworks become irrelevant, leading to inaccurate assessments and missed opportunities.

5	Identifying KPIs that accurately reflect the complex impact of EdTech.	Irrelevant KPIs lead to misleading assessments and ineffective interventions.
	Collecting data for numerous KPIs can be time-consuming and resource intensive.	Leading to data collection fatigue and inaccurate data.
6	Existing governance structures may lack personnel with the necessary M&E skills.	Ineffective implementation of the M&E framework.
	Existing structures may be resistant to adopting new M&E practices. Existing technology infrastructure may be insufficient to support M&E activities.	Slow adoption and limited impact of the framework. Monitoring and Evaluation is limited.
7	M&E may not be a high priority compared to other educational needs.	Project objectives are not achieved, and the targets do not get reported.
Opportunities		
1	A standardized framework enables evidence-based decisions about EdTech investments and strategies.	More effective allocation of resources and improved learning outcomes.
	A clear framework promotes transparency and accountability among stakeholders.	Increased trust and stakeholder buy-in. Accelerated innovation and improved EdTech implementation.
	A standardized framework facilitates the sharing of best practices and lessons learned across institutions.	
2	KPIs provide specific targets for improvement, enabling focused interventions. KPIs can demonstrate the return on investment in EdTech initiatives. KPIs can be used to track individual learner progress and tailor interventions.	Will lead to more efficient and effective EdTech programs and products. Increased funding and support for EdTech. Improved learning outcomes for all learners.
3	Feedback is collected and translated into actionable changes.	Feedback collection promotes collaboration and engagement. Improvement of EdTech strategies.

4	M&E data can inform more efficient resource allocation.	Maximized impact of EdTech investments.
	Strong M&E data can attract external funding from donors and partners. Adequate resources ensure the long-term sustainability of EdTech initiatives.	Increased financial resources for EdTech initiatives. Long term positive educational impact.
5	Use of AI and big data analytics for performance tracking.	Enables predictive analysis for proactive decision-making and improvement.

15.4 Key Performance Indicators (KPIs) for EdTech Adoption

i. Number of digital education initiatives implemented
ii. Number of KPIs for EdTech adoption, learner engagement, and learning outcomes
iii. Implemented real-time data dashboards for monitoring digital education trends
iv. Enhanced capacities of officers or personnel in the governance chain
v. Improved financial and technological resources for M&E implementation

15.5 Continuous Assessment and Feedback Mechanisms

15.6 Annual EdTech Impact Reports

i. Develop standardised reporting templates for data collection processes across schools, districts, and regional and national levels.
ii. Includes both quantitative (e.g. test scores and platform usage) and qualitative (e.g. teacher/learner feedback) metrics.
iii. Collaborate with independent evaluators or academic institutions for unbiased reports.
iv. Develop standardised dissemination strategies at all levels and have a system to monitor whether the disseminated reports are being used to improve learning outcomes.

15.7 Improvements Based on Findings

i. Establish structured processes for integrating findings from assessments and reports into policy updates.
ii. Pilot new interventions before full-scale rollouts based on the identified gaps.
iii. Foster a culture of continuous learning among policymakers, educators and developers.

15.8 Key Actions and Strategies

Action/Strategy	Expected Outcome
Adopt the national M&E framework for EdTech implementation.	Consistent evaluation and improvement of digital education initiatives.
Define and track KPIs for EdTech adoption, learner engagement, and learning outcomes.	Measurable insights into EdTech programs and products.
Implement real-time data dashboards for monitoring digital education trends.	Immediate feedback for policymakers and educators.
Conduct periodic impact assessments and case studies on EdTech projects and this should be done by local actors in the school community.	Data-driven decision-making and resource allocation.
Conduct capacity-building programmes for existing governance structures	Enhanced capacities of officers or personnel in the governance chain
Equitable allocation of financial and technological resources for effective implementation of M&E	Improved financial and technological resources for M&E implementation

15.9 Action Plan

Action	Timeline	Resources Needed	Responsible
Adopt a national M&E framework	End of Q4, 2025	Financial, Logistics and Human Resources	MoE, GES, CTVET, GTVET Services, CENDLOS, World Bank, CEA, DPs
Define and track KPIs for EdTech adoption, learner engagement, and learning outcomes	End of Q4, 2025	Financial, Logistics and Human Resources	MoE, GES, CTVET, Ghana TVET Services, CENDLOS, World Bank, CEA, DPs
Implement real-time data dashboards	End of Q2, 2026	Financial, Logistics and Human Resources	MoE, GES, CTVET, Ghana TVET Services, CENDLOS, World Bank, CEA, DPs
Conduct periodic impact assessments and case studies	Yearly	Financial, Logistics and Human Resources	MoE, GES, NaSIA, CTVET, Ghana TVET Services, CENDLOS, World Bank, CEA, DPs
Conduct capacity-building programmes	At least twice per year	Financial, Logistics and Human Resources	MoE, GES, CTVET, Ghana TVET Services, CENDLOS, World Bank, CEA, DPs

Allocation of financial and technological resources	Yearly	Financial	Government and DPs

15.10 Performance Indicators

Indicator	Target	Data Source	Frequency
Number of MoE agencies that have adopted the national M&E framework	100% of MoE agencies and implementing the M&E framework by the end of 2026	Agencies under MoE	One time
Number of KPIs for EdTech adoption and learner engagement	75% of learners at all levels engaged by 2030	Educational institutions	Termly/semesterly
Integrate real-time data dashboards for monitoring digital education trends	Operationalised dashboard with the required functionalities by mid 2026	MoE and agencies	Ongoing
Enhanced capacities of officers or personnel in the governance chain	50% of officers trained by the end of Q2, 2026	MoE, agencies and training providers	Every quarter
Improved financial and technological resources allocation for M&E implementation	80% of financial and technological resources required allocated by Q2 2026	MoE and agencies	Annually

15.11 Risk Assessment

Risk	Impact	Likelihood	Mitigation Strategy
Limited expertise in the development of M&E framework	High	Medium	Effective collaboration between diverse actors for development of M&E framework
Lack of interest	High	Medium	Enhance participation among all actors to drive interest.
Inadequate resources	High	Medium	Government to provide adequate resources, engaging development partners to support financing gaps

Political interference	High	High	Develop a national education plan to compel succeeding governments for continuity of plans

15.12 Roles and Responsibilities

Role	Responsibility	Expected Contribution
MoE	Policy formulation and monitoring	Established policies for guiding M&E framework implementation
GES, CTVET, Ghana TVET, Services, CENDLOS and CEA and all other agencies	Policy implementation and adherence	Adherence to implementation of established M&E framework
World Bank and DPs	Technical and financial support	Financial and technical support for the development and implementation of M&E framework will be available.

15.13 Alignment with Other Pillars

i. Data Management and Reporting: Ensures accurate and timely reporting of EdTech implementation progress.
ii. Governance: Supports accountability by providing transparency regarding EdTech outcomes.
iii. Infrastructure and Connectivity: Uses M&E data to track progress in digital infrastructure deployment.
iv. Capacity Building: Helps measure the effectiveness of teacher training and professional development programs.
v. Management and Administration
vi. Inclusivity and accessibility
vii. AI and emerging technologies
viii. Data protection
ix. Experiential learning and innovation
x. Cyber security and digital safety
xi. Localised content creation
xii. Curriculum and ICT integration

Thematic Area 14: Sustainable and Financially Inclusive Digital Learning Systems

16. 1 Vision
Ensure sustainable, inclusive, and equitable access to digital education across Ghana through long-term planning, responsible investment, community ownership, and institutional resilience.

16.2 Objectives

Number	Objectives
1	Establish long-term financial sustainability mechanisms to support digital education systems.
2	Integrate environmental responsibility into digital infrastructure rollouts.
3	Ensure technology systems are scalable, interoperable, and locally maintainable.
4	Build institutional and human resource capacity to support digital transformation.
5	Promote social inclusion and community engagement in EdTech initiatives.

16. 3 Challenges and Opportunities

Category	Description	Impact/Significance
Challenges		
1	Lack of sustainability budgets and digital asset management at the school level	Low accountability of implementation of EdTech initiatives.
2	Environmental risks from unmanaged e-waste	Inconsistent data hinders accurate comparisons and analysis, making it difficult to assess overall effectiveness.
3	Fragmentation and lack of standards in digital platforms	Fragmented data limits the ability to gain a holistic view of EdTech's impact.
4	Teacher ICT confidence and district-level EdTech capacity gaps	The framework needs to be adaptable to the evolving technology systems.
Opportunities		
1	Existing refurbishment networks and solar initiatives	Outdated frameworks become irrelevant, leading to inaccurate assessments and missed opportunities.
2	Strong interest from the private sector and global development partners	Opportunity to leverage support and innovation for sustainable implementation.
3	CPD and TVET reforms enabling digital capacity building	Potential to build a skilled workforce for long-term success.
4	Regional hubs and youth-driven innovation potential	Ability to localize support and foster innovation from the ground up.
5	Integration with national data and policy frameworks	Enhances scalability and institutional alignment for EdTech programs.

16.4 Financial Planning for Digital Education

Effective financial planning for digital education involves estimating the lifecycle costs, planning sustainable investments, and ensuring long-term funding streams. This includes budgeting for infrastructure, training, content development, and maintenance. It also emphasises proactive financial literacy and school-based accountability in managing digital resources.

16.5 Inclusive Financing Models

Inclusive financing models are critical to ensure that no school or learner is left behind in the education system. These include tiered subsidies based on school needs, blended public-private funding, community contributions, and outcome-based financing. Each model is designed to support equitable access and ensure that low-resource schools are not disadvantaged.

16.6 Operational Efficiency in EdTech Investments

Operational efficiency includes the use of cost-effective solutions such as refurbished equipment, solar power, and shared resources. Schools are encouraged to adopt 'Computer-Lab-as-a-Service' (CaaS), optimise procurement processes, and integrate total cost of ownership planning to maximise the impact of limited funds.

16.7 Governance and Sustainability Oversight

Strong governance is essential for the sustainability of digital learning initiatives in higher education. This involves establishing clear roles for national and local stakeholders, creating sustainability benchmarks, and institutionalising mechanisms for regular audits, community feedback, and transparent reporting on digital investments.

16.8 Key Actions and Strategies

Action/Strategy	Expected Outcome
Establish the National EdTech Sustainability Fund	Sustainable financing for maintenance and upgrades
Deploy solar and energy-efficient devices	Improved digital access in off-grid schools
Adopt open-source, device-agnostic platforms	Cost-effective and future-proof systems
Build Regional EdTech Hubs	Localized training and innovation support
Launch Inclusion Campaign	Enhanced awareness and equitable participation
Implement Green ICT Procurement Policy	Reduced e-waste and environmental impact

16.9 Action Plan

Action	Timeline	Resources Needed	Responsible
Establish EdTech Sustainability Fund	Q3 2025	Government budget + donor seed grants	MoE, MoCD, Dev Partners
Rollout of solar and efficient devices in rural schools	2025–2027	Solar systems, vendor contracts	MoE, REA, Private Sector

Develop and disseminate Green ICT standards	Q4 2025	Technical consultants	GSA, MoE, EPA
Create EdTech Hubs in 16 regions	2025–2028	Physical space, trainers, equipment	MoE, GES, Colleges of Education
Train 10,000 digital educators	2025–2028	CPD programs, digital curricula	MoE, NTC, TVET Service
Launch a national inclusion campaign	Q1 2026	Media, community coordinators	MoE, GES, CSOs

16.10 Performance Indicators

Indicator	Target	Data Source	Frequency
Number of schools with sustainable ICT plans	80% by 2028	EMIS, GES reports	Annual
Proportion of EdTech devices recycled safely	90% by 2030	MoE, ERG reports	Biannual
Share of schools using solar-powered ICT	60% by 2027	REA, MoE	Annual
Number of teachers certified in digital pedagogy	10,000 by 2028	NTC, CPD records	Annual
Inclusion campaign outreach	1 million people by 2026	Survey, Media Analytics	Endline Evaluation

16.11 Risk Assessment

Risk	Impact	Likelihood	Mitigation Strategy
Funding delays or shortfalls	High	Medium	Diversify funding sources and adopt phased planning
Resistance to digital shift among staff	Medium	High	Intensive training and incentive schemes
Environmental non-compliance	Medium	Medium	Enforce green procurement and recycling mandates
System fragmentation and vendor lock-in	High	Medium	Promote open standards and government-led frameworks

16.12 Roles and Responsibilities

Role	Responsibility	Expected Contribution
Ministry of Education (MoE)	Overall coordination, policy oversight	Policy integration and program delivery
Ministry of Communications & Digitalization (MoCD)	Technical guidance and interoperability standards	Infrastructure and tech alignment
Ghana Education Service (GES)	Implementation and teacher training	Field execution and school support
District Education Offices	Local oversight and troubleshooting	Deployment and community liaison
Private Sector & PPPs	Equipment, services, technical training	Innovation and financing support

Civil Society & Communities	Monitoring, inclusion advocacy	Sustained engagement and transparency

16.13 Alignment with Other Pillars

i. **Infrastructure:** Ensures that physical and digital infrastructure investments are sustainable, energy efficient, and accessible across all regions.
ii. **Teacher Training**: Supports the professional development of educators in using digital tools effectively and maintaining digital learning environments.
iii. **Curriculum Integration**: Reinforces the embedding of digital literacy and EdTech competencies into the national curriculum at all educational levels.
iv. **Cybersecurity and Digital Safety**: Protects learner and teacher data from breaches and unauthorised access, ensuring a safe digital learning space.
v. **Data Management and Reporting**: Establish secure and interoperable systems for data collection, analysis, and use to support evidence-based decision making.
vi. **Monitoring and Evaluation**: Implement structured mechanisms to track progress, enforce accountability, and ensure compliance with national digital education standards.
vii. **Inclusion and Equity**: Guarantees that all learners, regardless of gender, location, or ability, benefit equally from digital education innovations.
viii. **Environmental Sustainability**: Promotes eco-conscious EdTech adoption through green procurement, solar energy use, and e-waste management strategies.
ix. **Financial Sustainability**: Aligns with long-term financing models, cost-effective infrastructure, and collaborative funding approaches to ensure the resilience of initiatives.

17 Conclusion

Ghana's EdTech Strategy represents a significant transition from isolated digital efforts to a unified, scalable, and sustainable national framework. By incorporating governance, infrastructure, pedagogy, innovation, and digital safeguards, this strategy establishes a foundation for transforming learning experiences throughout the country. Achieving the 14 strategic priorities, ranging from governance and connectivity to experiential learning and sustainable financing, will necessitate extensive collaboration among ministries, development partners, educational institutions, the private sector, and communities. A well-defined roadmap, performance indicators, and accountability structures are integrated to facilitate phased implementation and continuous improvement. In conclusion, this strategy embodies Ghana's commitment to reimagine education for the digital age, not only by expanding access to technology, but also by ensuring that its use fosters inclusive, meaningful, and enduring transformation for both learners and educators. The future of education in Ghana is digital, inclusive, and sustainable; this strategy serves as a blueprint for achieving this vision.