basic education

Department:
Basic Education
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Draft e-Education Strategy

Transforming Basic Education through Digital Technologies

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Version 4.0 (Draft)

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FOREWORD BY THE MINISTER OF BASIC EDUCATION

In an era defined by rapid technological advancements, the education landscape calls for increased adaptation and innovation. Embracing the transformative power of technology is crucial to enhance educational outcomes, bridge the digital divide, and foster inclusive and sustainable development. Furthermore, technology has the potential of advancing that seeks to anchor basic education in learners' home languages.

The South African Basic Education Sector has always recognized the importance of e-Education in shaping the future of learning. This ideology was expressed through our joint creation of the first Strategy for ICT in Education with the Department of Communication in 2001 and subsequently the declaration of our own White Paper on e-Education in 2004.

We acknowledge that the White Paper on e-Education (2004) has not been fully implemented and no longer adequately addresses the emerging trends and developments in ICT. Therefore, we have an obligation to address the impact of the rapidly evolving ICT landscape and adapt to new technologies and trends.

We also have the responsibility to respond to the challenges and opportunities posed by the COVID-19 pandemic in 2020 and build on the progress already made in expanding ICT access, developing digital resources and professional development. We therefore present the e-Education Strategy as a roadmap to accelerate the use of technology for quality and equitable basic education in South Africa.

Drawing from the findings of the 2023 South African Global Education Monitoring Report on the role of technology in education and its implications for access, equity, inclusion, quality, and system management, this strategy aims to address disparities in these aspects and ensure that all learners, regardless of their background or location, have quality digital education opportunities. It also aims to gives expression to national and international commitments such the National Development Plan 2030, African Union Agenda 2063, and Sustainable Development Goal 4.

Our e-Education Strategy is underpinned by the key principles of:

- Equity and inclusivity by ensuring equal access to e-education opportunities for all learners.
- Pedagogical excellence by integrating technology to enhance teaching approaches, advance Mother Tongue-based Bilingual Education, and empower teachers with digital tools and training.
- Digital infrastructure by investing in and expanding connectivity, devices, and digital resources to support e-education initiatives.
- Lifelong learning by promoting ongoing pursuit of knowledge for all South Africans, encompassing formal and informal education, skills development, and continuous professional development for teachers.
- Efficiency by utilizing ICTs to streamline administrative processes and improve education system efficiency.
- Data security and privacy by safeguarding learner data privacy and security, ensuring safe and conducive digital learning environments.
- Collaboration with stakeholders, including the private sector, civil society, philanthropists, school governing bodies, social and international partners, to leverage collective expertise and resources.

This strategy outlines the key actions to achieve its objectives, which include ensuring adequate and reliable connectivity for all schools, especially in rural and remote areas, expanding ICT infrastructure and device access in schools, developing high-quality digital learning resources aligned with the curriculum, providing SACE accredited training and support for teachers to integrate ICTs into teaching, promoting ICTs to support inclusive education and lifelong learning, as well as providing a regulated online schools environment. Additionally, the strategy advocates for a modernized Education Management and Information System (EMIS) as well as Examinations/Assessments processes and systems that meet the changing needs of the basic education sector.

This e-Education Strategy demonstrates our commitment to harnessing the transformative power of technology to ensure that South Africa remains at the forefront of educational innovation in the 21st century.

The successful implementation of this strategy calls for the commitment and collaboration of all stakeholders – the government, private sector, civil society, academia, and the teaching profession. Together, we can create a truly digital education system that empowers all learners to reach their full potential in a rapidly changing world.

Minister of Basic Education

[Date]

EXECUTIVE SUMMARY

The e-education strategy document outlines the vision, goals, objectives, and actions for transforming learning and teaching through information and communication technologies (ICTs) in the basic education sector.

The vision is to enable all learners and teachers to access, create, and use digital resources and tools for quality learning outcomes, skills development, and lifelong learning. The strategy aims to achieve this vision by addressing four key challenges: access, equity, and inclusion; quality and relevance; technology advancement; and system management.

The overarching strategy comprises seven distinct outcomes, each delineated with specific outputs and actions. These encompass the ensuring of universal access to affordable, reliable, and suitable technology for both learners and teachers, empowering them with digital literacy and skills. The strategy also aims to enhance the quality, relevance, and inclusiveness of education through seamless integration of technology into the curriculum, fostering the creation and sharing of open educational resources. Additionally, it seeks to leverage ICTs for system efficiency, effectiveness, and accountability, establishing a robust governance framework for technology in education. The strategy also seeks to promote a culture of digital citizenship and cybersafety, along with ethical and responsible ICT use for education. Furthermore, it emphasizes continuous adaptation of e-education strategies to remain abreast of evolving ICT trends and innovations.

The strategy also identifies the roles and responsibilities of various stakeholders, such as the national, provincial departments of education, private sector, civil society, and development partners.

The e-education strategy document is a living document that will be reviewed and updated regularly to reflect the changing needs and realities of the basic education sector and the ICT landscape. The document is intended to provide a coherent and comprehensive framework for harnessing the potential of ICTs for improving the quality and equity of education in South Africa.

ACKNOWLEDGEMENTS

This strategy would not have been possible without the valuable contributions of various stakeholders. The Basic Education e-Education Strategy team extends its heartfelt thanks for their time, resources, and inputs.

In particular, we would like to express our sincere gratitude to:

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The British Council in South Africa for the financial support, which provided access to strategy and EdTech experts, whose insights proved crucial in shaping and strengthening this e-Education strategy.

LIST OF ACRONYMS

ACRONYM	MEANING
AR	Augmented Reality
BENET	Basic Education National Educational Network
BYOD	Bring Your Own Device
CES	Chief Education Specialist
CESA	Continental Education Strategy for Africa
COVID-19	Coronavirus Disease 2019 caused by the SARS-CoV-2 virus.
CSR	Corporate Social Responsibility
DBE	Department of Basic Education
DBE	Department of Basic Education
DCDT	Department of Communications and Digital Technologies
DCES	Deputy Chief Education Specialist
DHET	Department of Higher Education and Training in South Africa.
DPME	Department of Planning, Monitoring, and Evaluation
DPSA	Department of Public Service and Administration
DPSA	Department of Public Service and Administration in South Africa.
DSI	Department of Science and Innovation in South Africa.
eCares	Early Childhood Administration and Reporting System
ECD	Early Childhood Development
EdTech	Education Technology
e-Learning	
EMIS	Education Management Information System
FET	Further Education and Training
GET	General Education and Training
GEM	Global Education Monitoring
GTAC	Government Technical Advisory Centre
HEDCOM	Heads of Education Departments Committee
ICTs	Information Communication Technologies
ICT CFT	UNESCO ICT Competency Framework for Teachers

ACRONYM	MEANING
ICT4RED	Information Communication and Technology for Rural Education Development
LTSM	Learning and Teaching Support Materials
MST	Mathematics, Science and Technology
MTbBE	Mother Tongue-based Bilingual Education
NDP	National Development Plan
NEPAD	New Partnership for Africa's Development
NGO	Non-Governmental Organisation
NSC	National Senior Certificate
NSC	National Senior Certificate
ODG	Office of the Director-General
OECD	Organization for Economic Cooperation and Development
OER	Open Educational Resources
OP	Operation Phakisa
PED	Provincial Education Department
PED	Provincial Education Department
PMBOK	Project Management Body of Knowledge.
PMO	The Project Management Office
POPIA	Protection of Personal Information Act
PPM	Project Portfolio Management
PPP	Public-Private Partnership
R&D	Research and Development
RBM	Results-Based Management
SACE	South African Council for Educators
SA-SAMS	South African School Administration and Management System
SANReN	South African National Research and Education Network
SAPA	South African Principals Association
SDG	Sustainable Development Goals
SES	Senior Education Specialist
SITA	State Information Technology Agency
SONA	State of the Nation Address
TALIS	OECD Teaching and Learning International Survey
TENET	Tertiary Education and Research Network of South Africa
TPD	Teacher Professional Development
UNESCO	United Nations Educational, Scientific and Cultural Organisation
USAO	Universal Service and Access Obligation
VR	Virtual Reality

GLOSSARY

TERM	MEANING
Artificial Intelligence (AI)	Artificial intelligence (AI) is the ability of a computer program or a machine to think and learn. AI as a system's ability to correctly interpret external data, to learn from such data, and to use those learnings to achieve specific goals and tasks through flexible adaptation.
Big data analytics	Big data analytics is the often-complex process of examining large and varied data sets, or big data, to uncover information -- such as hidden patterns, unknown correlations, market trends and customer preferences -- that can help organisations make informed decisions
Cloud computing	Cloud computing is the on-demand availability of computer system resources, especially data storage and computing power, without direct active management by the user. The term is generally used to describe data centres available to many users over the Internet.
Digital Divide	They occur in a world experiencing increasing disparities between the rich and poor, among and within nations.
Digital literacy	Ability to find, evaluate, utilize, share, and create content using digital technologies and communication tools
Digitalisation	The use of digital technologies and digitised data to impact how work gets done, transform how customers and companies engage and interact.
e-Education	Integration of Information and Communication Technologies (ICTs) into the education system to enhance teaching, learning, management, and administration processes.
e-Learning	e-Learning is flexible learning using ICT resources, tools, and applications, focusing on accessing information, interaction among teachers, learners, and the online environment, collaborative learning, and production of materials, resources and learning experiences.
Mobile Learning (mLearning)	Accessing learning content through mobile devices.

TERM	MEANING
The Internet of Things (IoT)	The Internet of Things refers to the ever-growing network of physical objects that feature an IP address for internet connectivity, and the communication that occurs between these objects and other Internet-enabled devices and systems.

1. INTRODUCTION

South Africa's dynamic journey in pursuit of e-education, aiming to enhance learning and teaching outcomes, began with the 1997 White Paper on Education and Training, recognizing the transformative role of Information and Communications Technology (ICT). Subsequently, policies and strategies were developed, including the 2001 Strategy for ICT in Education and the 2004 White Paper on e-Education, which envisioned widespread ICT access and confident digital users by 2013.

This journey is marked by achievements and challenges seen in initiatives like the Khanya Project and Gauteng Online Project in the early 2000s, as well as collaborative ventures such as the NEPAD e-Schools project, Partners in Learning programme (PiL), and comprehensive studies like the e-Education Feasibility Study and ICT4RED project. South Africa's commitment to e-education persists, demonstrated by initiatives like the Operation Phakisa ICT in Education Initiative launched in 2015 and the 2019 President's State of the Nation Address (SONA) calling for accelerated digital transformation in the education sector.

However, despite commendable progress, South Africa's e-education journey faces critical crossroads. The White Paper on e-Education (2004) although outlining a promising vision for educational advancement through technology, has suffered from unequal, incoherent and incomplete implementation. It no longer adequately addresses the emerging trends and developments in ICT.

There is a lack of comprehensive strategic direction for e-education that addresses post-2004 national and global education-related policies, frameworks, curriculum reforms, educational priorities, and government commitments. Without comprehensively addressing these shortcomings and establishing a cohesive strategy, as well as reviewing the White Paper, its potential to transform education remains unfulfilled, perpetuating inequalities in

the basic education sector and remaining ineffective in addressing evolving educational requirements.

To address the lack of a current strategic directing document, the Basic Education sector has developed a coherent e-Education strategy that updates and operationalises the White Paper on e-Education, taking cognisance of the current and future ICT landscape and policy environment such as National Development Plan 2030, the Medium-Term Strategic Framework 2023-2027, the Action Plan to 2024: Towards Schooling 2030 and the systemic implementation Mother Tongue-based Bilingual Education. This strategy provides a clear roadmap for the implementation of e-education in the sector, guided by seven strategic outcomes, with specific outputs, indicators, targets, and actions.

The COVID-19 pandemic exposed the fragility of traditional education, emphasizing the critical need for flexible and resilient learning models powered by ICTs. The Global Education Monitoring (GEM) Report 2023 on technology in education warns against digital exclusion, inequality, and misuse, hindering efforts to achieve inclusive and equitable quality education for all South Africans.

The pandemic further exposed and exacerbated the digital divide, highlighting the unsatisfactory level of digital readiness in the South African basic education system. The GEM report estimates that only 55% of primary school learners and 65% of secondary school learners have access to a computer at home, and only 36% of primary school learners and 46% of secondary school learners have access to the internet at home. This lack of access hindered many learners from participating in remote learning during school closures. The report also highlights the lack of adequate ICT infrastructure, devices, connectivity, and digital content in many schools, especially in rural and disadvantaged areas, as well as the low level of digital competencies and skills among teachers and learners.

The TALIS 2018 results on equitable access to digital learning in South African schools revealed a significant disparity between the richest and poorest schools. In the richest quintile (Quintile 5), 62% of schools reported having equitable access to digital learning, whereas in the poorest quintile (Quintile 1), only 38% of schools reported the same level of access.

Additionally, the results on teacher self-efficacy in ICT use showed that 46% of South African teachers felt they could support learners using digital technology "quite a bit" or "a lot," which is lower than the OECD average of 67%.

Despite these challenges, South Africa also has opportunities and strengths to leverage ICT and e-education for transformation. The GEM report acknowledges the efforts and initiatives of the government, civil society, private sector, academia, and international organisations to improve ICT and e-education in the country.

The e-Education strategy is intended to be a living document, regularly reviewed, and updated to reflect the changing needs and realities of the e-education sector. The successful implementation of this Strategy will depend on the collective commitment and collaboration of all stakeholders involved in e-education in South Africa.

2. VISION, MISSION, AND GOALS

Vision:

A South Africa where all learners have access to and benefit from e-education.

Mission:

To develop and implement a comprehensive e-education strategy that will ensure that all learners can succeed in a digital world.

Goals:

The strategy has identified the following specific goals for the South African e-education initiative:

i. Ensure **equitable access** to affordable, reliable, and appropriate technology for all learners and teachers including fit-for-purpose devices, software, and internet connectivity.

ii. Empower learners and teachers with **digital literacy and skills** to effectively utilize technology for educational purposes, while enhancing the quality, relevance, and inclusiveness of education through seamless **integration of technology** into the curriculum, with a focus on supporting mother-tongue instruction and learning.

iii. Foster the creation, adaptation, sharing, and institutionalization of **Open Educational Resources (OER)**, including state-owned materials, with a focus on multilingual content to ensure accessibility and inclusivity for all learners. Additionally, develop a

sustainable system for managing, storing, and utilising OER, while promoting a culture of open licensing through increased awareness and advocacy efforts.

iv. To enhance educational outcomes and accountability by developing and utilizing **robust information systems** that support informed decision-making and operational efficiency across all levels of the education sector, ensuring data collection considers the linguistic diversity of learners.

v. **Modernize examination and assessment processes** through technology for increased efficiency and effectiveness, ensuring equitable access and integrity and the ability to assess learning within a multilingual context throughout the assessment cycle.

vi. Harness the power of technology to advance education for **sustainable development, civic education, and global citizenship, fostering intercultural understanding and promoting the use of technology in learners' mother tongues.**

vii. Establish a dynamic **governance and regulatory framework** for technology in education that ensures accountability, transparency, quality assurance, and ethical standards. This framework should continuously adapt to **evolving ICT trends and innovations**, prioritizing the integration of **multilingualism** in all policies and practices.

3. STRATEGIC OUTCOMES

The e-education strategy will serve as a roadmap for translating strategic outcomes into actionable steps by delineating specific deliverables. This aims to provide clarity and direction, to ensure that implementers understand what needs to be done and how it will be achieved. The strategy outlines seven outcomes for e-education advancement, with each supported by relevant outputs and actions across key areas like equitable access, skills development, quality remote education, innovation, information systems efficiency, modernised assessment processes and adaptability.

Outcome 1: Equitable Access to ICT Infrastructure and Content

All schools, teachers, and learners will have equitable access to appropriate ICT infrastructure, fit-for-purpose devices, connectivity, and engaging multilingual digital content, enabling them to benefit from e-education opportunities.

Outcome 2: **ICT Proficiency for Teachers and Learners**

Teachers and learners will be proficient in utilizing ICTs, seamlessly integrating technology into teaching and learning within a multilingual context, and effectively participating in the digital economy and society.

Outcome 3: **High-Quality Remote Education Opportunities**

A robust regulatory framework and support system will ensure high-quality, accessible, and equitable remote education opportunities through online and satellite platforms.

Outcome 4: **Culture of Innovation and Excellence**

A vibrant culture of innovation and excellence in e-education will flourish through promoting creativity, collaboration, knowledge creation through research, development, evaluation, and dissemination of effective e-learning models, tools, and resources that transform teaching and learning experiences. This will include a focus on supporting and promoting multilingual approaches, specifically fostering the development of mother-tongue pedagogy and resources.

Outcome 5: **Optimizing System Efficiency and Accountability**

Harness ICTs to optimize system efficiency, effectiveness, and accountability, enabling data-driven decision making, robust monitoring and evaluation, and enhanced communication, ultimately leading to improved management and administration as well as better resource allocation and utilization.

Outcome 6: **Efficient Examination Processes**

Enhance efficiency of examinations processes by leveraging technology.

Outcome 7: **Policy Translation and Adaptation**

Driven by the ongoing review of relevant policy frameworks and a focus on translating high-level plans like the White Paper on e-Education into clear and actionable policies that support mother-tongue education, South Africa's e-education system will be able to harness emerging technologies and navigate the dynamic digital landscape, transforming teaching and learning for all.

4. BEST PRACTICES

South Africa faces challenges in implementing its e-education strategy. However, there are valuable lessons from local initiatives and other countries that can help if customised to the south African context. These include successful approaches in areas of ICT infrastructure, teacher training, content development, and addressing educational inequality.

4.1. Lessons Learnt from Local Best Practices

INITIATIVE	STRENGTHS	LIMITATIONS
a) **Khanya Technology in Education Project implemented by the Western Cape Education Department (WCED)**	• Khanya's strategic pilot approach involved **well-researched pilots,** thus allowing for localized adaptation and effective utilization of emerging technologies. The project focused on specific educational needs, such as raising mathematics standards and improving literacy	• Khanya faced **funding constraints** due to unavailability of provincial and donor funding hence hindering timely implementation and expansion.
b) **The Gauteng Online (GoL) Project implemented by the Gauteng Education Department (GDE)**	• GoL's **extensive rollout of ICT infrastructure in many schools across Gauteng** providing computer labs significantly increased access to digital tools and resources for learners and teachers. This large-scale deployment **laid a foundational infrastructure for integrating ICT into the education system**, setting a precedent for future digital education initiatives in the province.	• The GoL Project faced significant **operational and maintenance challenges, including connectivity issues** that hampered the effectiveness of ICT resources. Many schools reported **inadequate technical support, leading to prolonged downtimes and underutilized computer labs.** Additionally, the **project struggled with infrastructure sustainability** as schools lacked the resources to maintain or upgrade their equipment. These issues highlighted the **need for a robust maintenance plan and**

INITIATIVE	STRENGTHS	LIMITATIONS
		reliable technical support to ensure long-term success.
c) ICT4RED (Information and Communication Technology for Rural Education Development) implemented by Department of Science and Technology (DST)	• ICT4RED project implemented a robust teacher professional development programme using a phased approach to comprehensively train teachers in using ICT tools through hands-on workshops, ongoing support, and peer collaboration. This training not only enhanced teachers' ICT skills but also empowered them to create engaging and interactive learning environments, ensuring the effective use of technology to improve educational outcomes.	• ICT4RED project faced significant **sustainability and maintenance challenges,** particularly in rural areas with limited resources. Maintaining the long-term functionality and relevance of ICT infrastructure was difficult due to issues like **equipment upkeep, consistent technical support, and securing ongoing funding** for updates and replacements. These challenges highlighted the need for a more robust plan to ensure the project's sustainability and continued support for the schools involved.
d) NEPAD e-Schools project is an initiative by the New Partnership for Africa's Development (NEPAD)	• The project used a **holistic approach to ICT integration** successfully integrating ICT into education by not only providing infrastructure like computers and internet, but also developing digital content and	• The project encountered **sustainability and maintenance challenges** regarding its ICT infrastructure. **Schools struggled to maintain and upgrade equipment** due to limited resources and support, especially in

INITIATIVE	STRENGTHS	LIMITATIONS
	offering thorough teacher training. This holistic approach ensured effective technology use by teachers and access to engaging resources for learners. As a result, participating schools saw enhanced teaching and learning outcomes, showcasing a holistic and impactful integration of ICT in schools according to UNESCO.	rural areas with **connectivity issues**. The **absence of a solid plan for ongoing technical support and resource allocation** resulted in many schools facing difficulties in keeping the technology operational in the long term.
e) TENET (Tertiary Education and Research Network of South Africa) for Connectivity	• **High-Speed Connectivity:** Provides high-speed internet connectivity • **Reliability and Redundancy:** Infrastructure is designed to be reliable with redundant systems in place to minimize downtime. • **Scalability:** The network is scalable, allowing it to grow and adapt to the increasing demands of universities. • **Cost Efficiency:** By providing centralized connectivity services, TENET can negotiate better pricing and service agreements with	• **Speed and reliability limitation for certain locations**: TENET connects campuses via low-speed rented access circuits and smaller sites through ADSL lines which may limit the speed and reliability for such locations • **Dependency on SANReN**: TENET closely collaborates SANReN and the dependency could pose challenges if SANReN faces issues or requires upgrades • **Limited Speeds**: Although TENET provides

INITIATIVE	STRENGTHS	LIMITATIONS
	ISPs. • **Advanced Services:** Beyond basic internet connectivity, TENET often provides additional services such as cybersecurity measures & cloud services • **Educational Equity:** By providing reliable and high-speed internet access to universities across South Africa, TENET helps bridge the digital divide, ensuring that all learners and faculty, regardless of their location, have access to the same quality of digital resources. • **Focus on Security:** TENET places a strong emphasis on cybersecurity, protecting the network and its users from cyber threats.	fast Internet service (up to 100Gbps), some users may still experience limitations due to **network congestion or other factors** • **Infrastructure Maintenance:** Like any network, TENET's infrastructure requires regular maintenance and upgrades. **Downtime during maintenance can impact users.**

4.2. Lessons Learnt from International Best Practices

AREAS OF INTERVENTION	STRENGTHS	LIMITATIONS
Multi-stakeholder partnerships:	• Brazil's "Todos pela Educação" model exemplifies the **power of multi-stakeholder partnerships** by effectively leveraging the diverse resources, funding, and expertise from government, civil society, and the private sector	• The partnerships are challenging to manage due to **differing priorities and accountability structures**.
Targeted Connectivity Programmes	• The Mexico's "Red Escolar" and Rwanda's Giga (real-time monitoring & reporting on type, quality & quantity of connectivity) partnership **prioritise internet access in schools, particularly in underserved rural areas**. Leveraging **innovative satellite solutions like Rwanda's Icyerekezo**, these programmes can provide affordable and reliable internet access to even the most remote locations, ensuring that connectivity barriers do not hinder equal access to education.	• Targeted connectivity programmes face significant **logistical and financial challenges**, especially in remote areas with difficult terrain or limited infrastructure. The reliance on satellite technology, although innovative, can be **costly and may require substantial initial investments and ongoing maintenance**.
Local Production: • **Rwanda's**	• Establishing **local laptop assembly plants, such as in Rwanda and Kenya** significantly **increased the availability and affordability of**	• Local production initiatives **require substantial initial investments in infrastructure**, technology, and skilled labour. Furthermore,

collaboration with Positivo BGH • **Kenya: Moi University & Jomo Kenyatta University (JKUAT)**	**devices as well as stimulated the local economy** through job creation and building local manufacturing capabilities. Additionally, producing laptops locally **reduced import costs and fostered innovation** tailored to regional needs and conditions.	sustaining such a project in the long term requires consistent demand and effective supply chain management, which can be disrupted by economic fluctuations or geopolitical issues.
Teacher Training and Support:	• **Targeted Training:** Mexico's "ProFuturo" programme exemplifies best practices in teacher professional development by **offering targeted training and digital resources tailored to teachers' specific needs**. This approach enhances teachers' pedagogical skills and boosts their confidence in using ICT in the classroom, leading to more effective and engaging teaching methods.	• "ProFuturo" programme encountered challenges such as **varying levels of ICT proficiency among teachers**, which can affect the uniformity and effectiveness of the training. Additionally, the programme's success **depends on continuous support and updates to keep pace with rapidly evolving technology**, which can be resource-intensive.
Content sharing platforms • Rwanda Education Commons	• **Tailored Content**: "Rwanda Education Commons" model, **content can be customised to meet specific educational needs, ensuring relevance and effectiveness.** • **Cost Savings**: By **reducing reliance on**	• **Infrastructure Challenges**: Access to **reliable internet and digital devices remains a hurdle** in some areas. • **Equity and Inclusion**: Digital platforms may **exacerbate existing inequalities**. Learners without access to technology or digital literacy

	printed textbooks and other physical resources, content sharing platforms can save costs for schools. Digital distribution eliminates **printing expenses and allows for efficient updates and revisions**.	skills may be left behind. • **Quality Control**: Requires proper curation and validation mechanisms to ensure quality and accuracy of shared content so that low-quality or outdated materials may not circulate.
• **Kenya's Approach with Kenya Institute of Curriculum Development (KICD)**	• **Cultural Relevance**: KICD involvement ensures that digital **content aligns with local culture, context, and curriculum.** Culturally relevant materials enhance engagement and understanding among learners. • **Curriculum Alignment**: KICD's participation **ensures that digital content aligns with national educational goals and standards**. This approach promotes consistency and coherence across subjects and grade levels. • **Teacher Empowerment**: Developing local content **involves teachers, empowering them to create and adapt materials** that resonate with their learners. This **teacher-driven approach fosters ownership and innovation**.	• **Resource Constraints**: Developing high-quality digital content requires resources, including funding, skilled personnel, and time. Ensuring sustained investment and support is crucial. • **Technological Literacy**: Teachers and learners need adequate training to effectively use digital content. Lack of digital literacy skills can hinder successful implementation. • **Maintenance and Updates**: Regular updates and maintenance are essential to keep content relevant and accurate. Neglecting this aspect can lead to outdated materials.

Inequality and Exclusion • **Kenya Digital Literacy Programme (DLP)**	• **Equitable Access:** Over one million devices were installed in over 19,000 public primary schools in Kenya (Phase 1) to bridge the digital divide. • **Enhanced Learning Opportunities: Improve learning and build 21st century skills among primary school learners.**	• **Security:** Theft of the devices • **Teacher Capacity**: Reluctance of elderly teachers to embrace technology. • **Infrastructure Challenges and Resource constraints:** Reliability of internet connectivity and electricity in rural areas**.**
• **Brazil's "Todos pela Educação" Programme (Targeted Support)**	• **Focused Intervention:** The programme **targets disadvantaged schools**, aiming to reduce educational inequalities and address specific needs. • **Teacher Valorization:** Emphasizing **teacher quality and working conditions is crucia**l. Well-prepared, motivated teachers positively impact learning outcomes. • **Collaboration Across Levels:** The programme involves federal, state, and school-level stakeholders, promoting a coordinated effort to improve education.	• **Resource Allocation:** Funding constraints limit the programme's reach. Ensuring sustained investment is essential. • **Implementation Challenges:** Effective execution requires overcoming bureaucratic hurdles, aligning policies, and monitoring progress**.** • **Equity in Implementation:** Ensuring equitable access to programme benefits across diverse contexts can be challenging.

5. SWOT ANALYSIS OF E-EDUCATION ENVIRONMENT

The e-education landscape in South Africa presents a dynamic terrain of opportunities, challenges, strengths, and weaknesses. A comprehensive SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis serves as a strategic compass for navigating the complexities of this digital learning ecosystem which the e-education strategy must take cognisance of.

Table 1: SWOT Analysis

STRENGTHS	WEAKNESSES
• **Government Commitment:** The government's integrated policies, investment and initiatives show strong commitment to e-education implementation. • **Digital Infrastructure:** South Africa has made progress in developing digital infrastructure, including internet connectivity and access to devices. • **Recognition of Transformative Role**: The strategy recognizes the transformative role of ICT in education, aligning with global perspectives highlighted in the UNESCO report.	• **Incomplete Implementation**: The 2004 White Paper on e-Education remains partially implemented, indicating a gap between policy and execution. • **Lack of Updated Strategy:** The absence of an updated strategy fails to address emerging trends and global policies, as noted in the UNESCO 2023 GEM report. • **Digital Divide:** Infrastructure gaps, especially in rural areas, hinder equitable e-education implementation in South Africa. • **Inconsistent Implementation Approach**: The absence of a consistent implementation approach, stemming from the overlapping responsibilities of national and provincial governments, has led to unequal e-education implementation across different provinces.

	• **Teacher Resistance and Inadequate Training**: This weakens e-education implementation in South Africa. • **Weak Funding Model:** The absence of a sustainable funding model for e-education implementation
OPPORTUNITIES	**THREATS**
• **Collaboration**: Partnerships with NGOs and private sector present an opportunity for building capacity and providing ICT infrastructure. • **Data-Driven Insights:** Use data analytics to improve teaching and learning outcomes. • **Elements of Effective Strategy**: Leveraging the evolving ICT landscape, aligning with global trends, building resilience, and addressing evolving educational needs are key elements for an effective strategy. • **Community Engagement**: This has the potential to support ICT initiatives in schools, create employment opportunities and develop ICT skills in local communities • **Focus on Equity**: Addressing the digital divide can ensure inclusive access to e-learning benefits.	• **Policy Disharmony:** Lack of synergy between government departments' policies can create confusion and hinder implementation. • **Socioeconomic Factors**: Economic disparities impact access to devices and connectivity. • **Funding Instability**: Unsustainable funding models can threaten long-term e-education initiatives. • **Rapid Technological Change and Inflexible Policy**: This threatens to hinder e-education implementation in South Africa. • **Teacher Capacity**: Lack of teacher preparedness and resistance to emerging technologies may hinder effective e-education implementation. • **Outdated Infrastructure**: Inadequate infrastructure may hinder effective implementation, particularly in

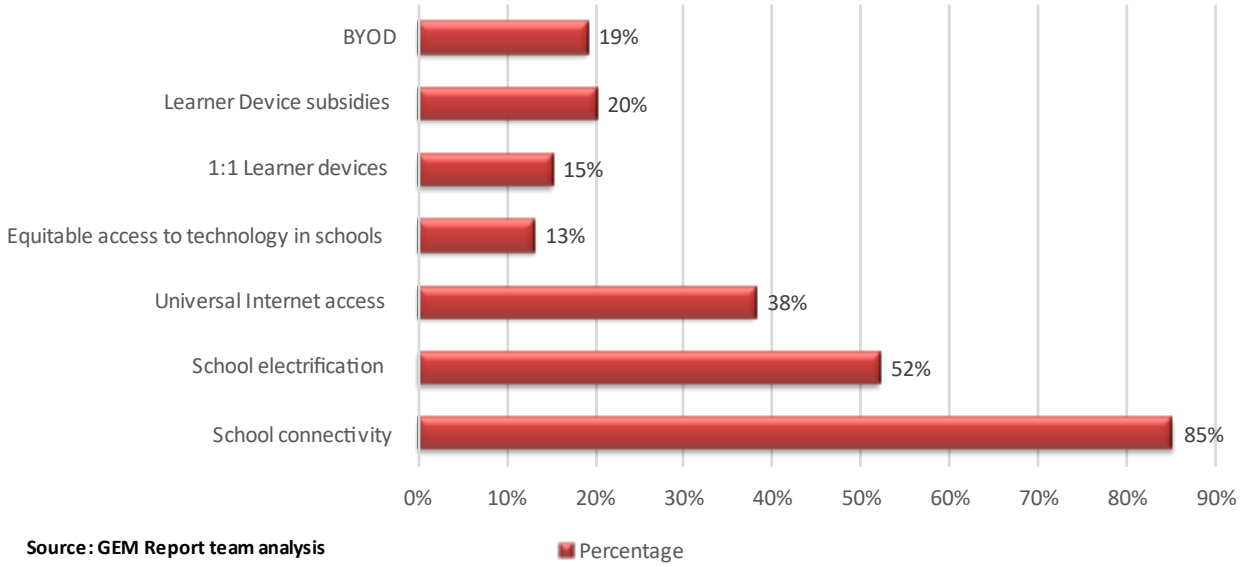
remote or underserved areas.

6. POLICY PERSPECTIVE AND LEGISLATIVE ENVIRONMENT

There is no specific e-Education Act in basic education. Instead, the sector relies on the 2004 White Paper on e-Education as the authoritative guidelines outlining government's policy proposal for e-education. Over the past two decades since the adoption of the White Paper, technology has progressively permeated education. This evolution has led to the development of numerous policies, plans, strategies, and frameworks. These documents play a crucial role in shaping various aspects of the e-education strategy, including ensuring equitable access to ICT infrastructure and content, fostering innovation and excellence in e-education, optimizing system efficiency, and harnessing emerging technologies.

The GEM Report 2023 outlines how UNESCO peer countries are implementing various policies to enhance technology access, focusing primarily on infrastructure improvements to ensure equitable access to electricity and internet connectivity.

Fig 1: Percentage of Education Ministries with specific EdTech-related policies



Source: GEM Report team analysis

Therefore, the e-Education Strategy must thoroughly examine how the current policy landscape, regulations, and legal frameworks inform the strategic direction of e-education in South Africa.

Table 2: EdTech-related policies/regulations

POLICY / FRAMEWORK	IMPACT ON / OF E-EDUCATION STRATEGY
1. White Paper on e-Education 2004	This document lays the foundation for e-education in South Africa, outlining its vision, goals, and strategies. It serves as a guiding document for the overall implementation of the e-education strategy.
2. South African National Development Plan (NDP) 2030	The NDP advocates for the improvement of the quality of education, skill development and innovation. It specifically requests for the leveraging of technology to address educational challenges such as the delivery of textbooks and other LTSM to remote schools, hence influencing the direction and priorities of the e-education strategy.
3. The Basic Education Action Plan to 2024: Towards the realisation of Schooling 2030	This plan helps create the necessary foundation for implementing the e-education strategy by setting goals focusing on teacher training, learner access to technology, and schools leveraging technology for improved support services and parental involvement.
4. The SA Connect Policy	This policy aims to connect all South Africans to affordable and reliable internet access, hence the e-Education strategy relies on SA Connect to ensure schools, especially in rural areas, have broadband access and ICT infrastructure, enhancing ICT utilization in education.
5. 2005 Electronic Communications Act (as amended in 2014)	This policy enhances digital infrastructure and accessibility by promoting universal service and access, thereby facilitating the integration of ICT in education.
6. National Digital and Future Skills Strategy	This strategy aims to build a digitally skilled society capable of participating in the evolving digital economy by promoting digital skills integration in the curriculum, enhancing teacher training, and improving digital literacy and infrastructure in schools.

POLICY / FRAMEWORK	IMPACT ON / OF E-EDUCATION STRATEGY
7. **South Africa Professional Development Framework for Digital Learning**	This framework ensures competent teachers effectively using ICTs to enhance teaching and learning. It provides guidelines, competencies, and tools for professional development, aligning with the e-Education strategy's goal of supporting teachers in using ICTs effectively and responsibly.
8. **The National Curriculum Statements Grades R-12**	Aligned with the e-Education strategy, this policy ensures ICT integration into teaching and learning across subjects, enhancing assessment and feedback processes.
9. **The National Policy Framework for Teacher Education and Development in South Africa**	This focuses on equipping teachers with the necessary competencies, including digital literacy skills, to use technology effectively in the classroom. This aligns with the goals of the e-education strategy for a tech-enabled learning environment.
10. **Draft Digital Guidelines for South African School**	This framework aims to provide clear guidelines for effective digital learning. When finalized, these standards will ensure consistency and effectiveness for successful implementation of the e-education strategy across schools.
11. **Universal Service and Access Obligation (USAO)**	This requirement ensures universal access to ICTs, supporting the e-Education strategy's goal of providing broadband services and ICT infrastructure, especially in rural districts.
12. **The National Education Information Policy**	This policy ensures accurate, reliable, and timely education information management, supported by ICTs. The e-Education strategy aligns by providing ICTs and digital skills to education managers, enhancing information systems' quality and efficiency.
13. **The National Policy on an Equitable Provision of an Enabling School Physical Teaching**	This is the policy ensures adequate infrastructure to support technology use in schools, hence aligning with the e-Education strategy's goal of providing appropriate infrastructure.

POLICY / FRAMEWORK	IMPACT ON / OF E-EDUCATION STRATEGY
and Learning Environment	
14. The Draft Policy on Rural Education	This policy addresses the specific needs of rural education by ensuring access to quality education through ICTs, which aligns with the e-Education strategy's aim to overcome barriers of distance and marginalization.
15. The National Integrated ICT Policy White Paper	This policy focuses on developing digital skills, thus aligning with the e-Education strategy's goal of equipping learners with digital skills, fostering innovation and competitiveness.
16. Protection of Personal Information Act (POPIA)	This legislation safeguards the privacy and security of learner and teacher data when utilizing technology in education. This ensures responsible and ethical implementation of the e-education strategy.
17. National Data and Cloud Policy 2024	This policy enforce local data storage, enhances data security, and promotes equitable cloud access, while also advocating for the introduction of digital skills across the learning ecosystem.
18. Draft regulations for online schools	This framework, under review, helps regulate and standardize the quality and practices of online learning schools. This contributes to ensuring quality and consistency within the e-education ecosystem.
19. Opportunities, guidelines & guardrails for effective & equitable use of AI in education	Provides a framework for responsible integration of AI technologies, ensuring both opportunities for enhanced learning experiences and measures to address equity and ethical considerations.
20. UNESCO Guidelines for ICT in Education Policies and	Provides a comprehensive framework for enhancing digital infrastructure, building teacher capacity, and ensuring equitable access to quality digital learning resources in the implementation of e-education.

POLICY / FRAMEWORK	IMPACT ON / OF E-EDUCATION STRATEGY
Masterplans	
21. UNESCO ICT Competency Framework for Teachers (ICT CFT)	Aims to help teachers develop the digital competencies and skills that are necessary for transforming learning and teaching in a changing world, which aligns with the e-Education strategy's goal of transforming teaching and learning through technology.
22. UNESCO Draft AI competency frameworks for teachers and for school learners	These frameworks provide guidelines for responsible AI integration into education, aligning with the e-Education strategy's goal of leveraging AI in curriculum and professional development.
23. UNESCO draft guideline for Generative AI in Education and Research	This is a document provides guidelines for ethical AI use in education, which aligns with the e-Education strategy's aim of ensuring quality, transparency, and accountability in AI-based learning materials.
24. Sustainable Development Goal 4 (SDG 4) of the United Nations	SDG 4 aims to ensure inclusive and equitable quality education, promoting lifelong learning opportunities for all. This global commitment aligns with the goals of the e-education strategy to provide accessible and quality education through technology.
25. The Continental Education Strategy for Africa (CESA)	This strategy aims to foster collaboration and knowledge sharing among African nations in their educational development efforts. It encourages South Africa to learn from and contribute to best practices in implementing its e-education strategy within the broader African context.

7. CRITICAL SUCCESS FACTORS FOR E-EDUCATION IMPLEMENTATION

The strategy takes cognisance of several critical factors required for the effective implementation and sustainability of e-education in South Africa. These factors echo the recommendations outlined in the 2018 ICT in Education Operation Phakisa lab report.

Unfortunately, many of these recommendations remain unimplemented, contributing to the unsatisfactory state of e-education implementation across provinces:

a) **E-Readiness of Schools:** Conducting a comprehensive and data-driven ICT needs assessment to gather information on the current ICT status of schools, teachers, and learners. This information will inform resource allocation and infrastructure development plans. Schools that do not meet e-readiness criteria must be identified and fast-tracked for the required remedies.

b) **Teacher Capacity:** Adequately trained teachers are essential for integrating technology into the curriculum, facilitating learner engagement, and ensuring equitable access to educational resources.

c) **Ring-fence (dedicated) Funding:** Allocating dedicated funding streams within the education budget to finance the implementation and sustainability of e-Education initiatives.

d) **Dedicated delivery Units:** Establishment of a dedicated e-education **implementation unit** within each Provincial and National Education Department to oversee and coordinate the implementation of the e-education strategy. Each provincial delivery unit shall have a minimum composition of relevant implementing officials at the level of director, chief education specialist, deputy chief education specialists and senior education specialists. The maximum size and composition of the implementing unit will differ from province to province and from district to district depending on the number of schools and context.

Table 3: Proposed Minimum Composition of a Delivery Unit:

Ranks	National	Provincial	District
Director	1	1	0
Chief Education Specialist (CES)	5	1 /2000 schools	1 /100 schools
Deputy Chief Education Specialist (DCES)	0	1 /1000 schools	1 /40 schools
Senior Education Specialist (SES	0	0	1 /20 schools

e) **ICT Integration Guidelines**: Development and implementation of comprehensive ICT integration guidelines that outline the effective integration of ICTs into the curriculum,

pedagogy, and assessment for all levels of education. These guidelines should be based on best practices, research findings, and the specific needs of the South African education system.

f) **Collaboration and Partnerships**: Promoting collaboration and partnerships among government departments (DCDT, DHET, DSI, DPME, DPSA), agencies, educational institutions, the private sector, civil society, academia, international organisations, non-profit organisations, and international experts to collectively address challenges, identify opportunities, share best practices, leverage resources, and enhance e-education initiatives within the e-education ecosystem.

g) **Updating e-Education White Paper**: Updating the 2004 e-Education White Paper to ensure it effectively addresses emerging trends in ICT and aligns with post-2004 developments in domestic and global education policies, frameworks, curriculum reforms, and evolving educational priorities and government commitments.

h) **Adopting Digital Guidelines for Basic Education**: The guidelines a structured approach to digital learning, equipping teachers and learners with the tools they need to thrive in the digital age. It is imperative that national and provincial implementation plans are aligned to these guidelines.

i) **Inclusivity**: By ensuring the accessibility of digital resources and tools for hearing and visually impaired learners, as well as those with other disabilities, and by providing multilingual materials, e-education can effectively cater to diverse learning needs and provide a powerful tool for inclusive education.

j) **Emerging ICT Trends and Innovations**: Implementation of an ongoing process for identifying, evaluating, and integrating emerging ICT trends and innovations into e-education strategies.

k) **Monitoring and Evaluation Framework**: Establishing an ongoing monitoring and evaluation framework to continuously assess the implementation of the e-Education strategy, aligning with the National Monitoring and Evaluation Framework for Education.

l) **Continue with existing ICT initiatives:** The implementation of existing initiatives should not be curtailed or suspended while the provincial plans are aligned to the e-education strategy.

8. PROSPECTS OF EMERGING TECHNOLOGIES IN BASIC EDUCATION

Emerging technologies are poised to significantly transform the South African basic education sector in the present and future. However, the successful implementation of these technologies must be guided by a focus on **educational benefit**. Only technologies that demonstrably enhance learning outcomes should be considered, avoiding the adoption of emerging technologies simply for the sake of novelty. This focus requires robust infrastructure, professional development for teachers, and policies that ensure equitable access to all learners, regardless of their socio-economic background.

Table 4: EdTech-related Emerging Technologies

Emerging Technology	Impact on South African Basic Education
Artificial Intelligence (AI)	• Personalises learning experiences based on individual needs and learning styles (differentiated instruction) • Assists in identifying areas of struggle for learners and provides tailored support • AI-powered chatbots can provide language support, answer questions, and assist learners. • Addresses resource constraints by offering adaptive learning solutions • Streamlines examination processes through automated grading and feedback systems. • Supports learners with disabilities through speech-to-text and predictive text technologies.
Virtual Reality (VR)	• Transforms classroom learning by providing immersive experiences • Simulates real-world environments for practical examinations. • Offers virtual manipulatives for learners with physical disabilities.
Augmented Reality (AR)	• Makes complex concepts tangible and engaging • Enhances learners' engagement and retention rates • Learners can scan printed text in their mother tongue to access additional information or translations. • Supports learners with visual impairments by overlaying textual

	information on real-world objects.
Internet of Things (IoT)	• Creates 'smart classrooms' by optimizing learning environments. • IoT-enabled learning apps can provide real-time feedback and personalised assessment tasks. • Automates attendance and examination check-ins. • Enhances security and integrity of examinations through biometric verification.
Mobile Learning (mLearning) (Remote Education)	• Enable inclusive & equitable access to education, particularly in remote areas. • Extends learning beyond traditional classrooms. • Mobile apps can offer learning exercises, games, and interactive lessons. • Facilitates remote examination administration and proctoring including secure online registration and e-marking capabilities.
Cloud Computing	• Provides access to educational resources and tools from anywhere with internet connectivity, bridging the gap between urban and remote areas. • Reduces dependency on physical infrastructure like textbooks, making education more affordable and accessible. • Ensure scalability, security, storage, and easy distribution of Multilingual resources. • Facilitates real-time updates and collaboration among learners and teachers, ensuring up-to-date learning materials and dynamic interaction. • Enables secure storage and distribution of examination materials. • Supports the creation of digital Individualized Education Programmes (IEPs) for learners with disabilities.
Educational Gaming	• Increases engagement and motivation through interactive experiences. • Adapts to individual learning styles and enhance cognitive, motor, and socio-emotional skills while promoting language acquisition, collaboration, and communication • Provides immediate feedback for learning and retention.

	• Develops critical thinking and creativity through problem-solving.
Big Data Analytics	• Enables personalised learning paths, tracking learner progress, identifying learning gaps, resources allocation, and assessing programme effectiveness for informed decision-making. • Analysing language learning data helps tailor MTbBE programmes and resources. • Analyses examination results to improve teaching strategies and learning materials.

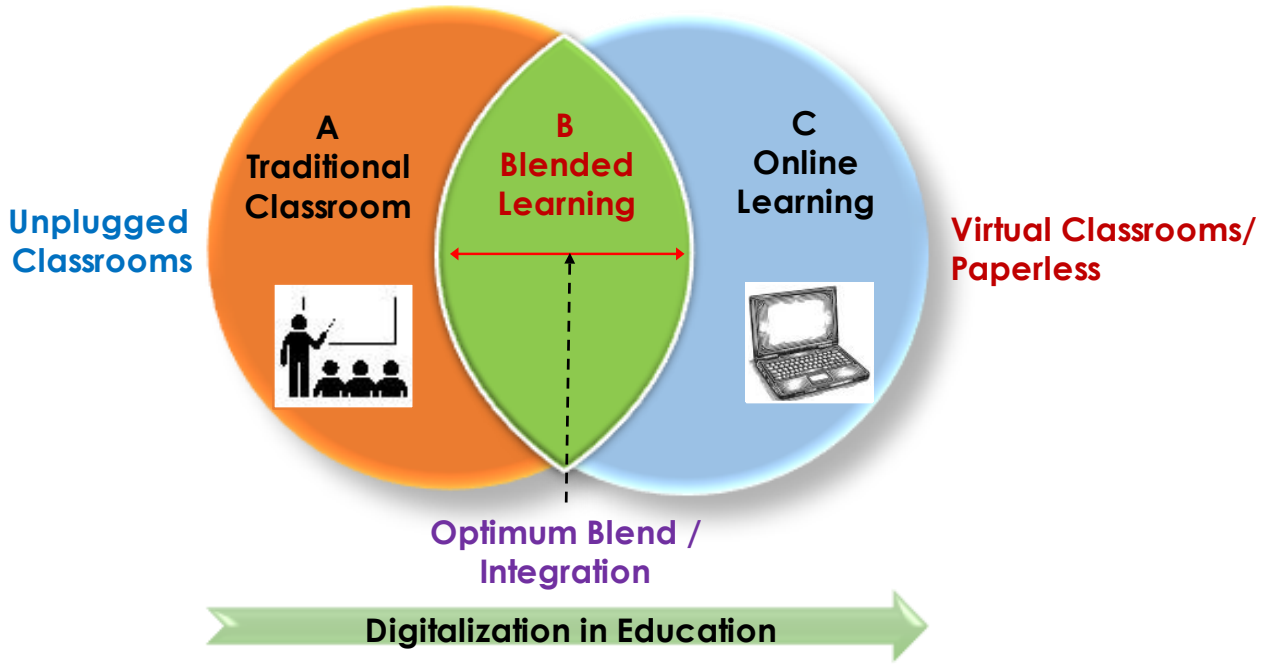
9. STRATEGY APPROACH

The systematic plan for e-education implementation of e-education in the basic education sector is premised on the gradual fulfillment of key considerations for a viable and sustainable e-education rollout across the country.

Blended (Hybrid) Learning Model

The blended learning model which combines the traditional face-to-face classroom methods with online activities and independent learning, allowing for a more personalised and flexible learning experience aligns well with the goals of South Africa's e-education strategy.

Fig 2: Blended (Hybrid) Learning Model



The gradual introduction of the blended learning model in basic education offers a **scalable and cost-effective approach**. It aligns with the **2023 GEM Report on Technology in Education**, advocating for a flexible and resilient education system that prioritises **accessibility, equity, inclusivity, and quality, as outlined below.**

- **Flexibility and Resilience**: Blended learning offers a robust framework that can adapt to various scenarios, including disruptions like pandemics or other emergencies. It allows for continuity of education when traditional classroom settings are not feasible.
- **Accessibility**: Blended learning enables learners in remote or rural areas to access quality educational resources and experiences that might otherwise be unavailable as advocated by the NDP 2030. This helps bridge the digital divide and ensures that more learners have access to learning opportunities.
- **Equity and Inclusivity**: Blended learning can cater to diverse learning needs and styles of learners by providing personalised learning paths that can help all learners succeed, including those with disabilities. The GEM Report 2023 emphasizes the role of technology in improving equity and inclusion in education.
- **Quality Education:** Blended learning can enhance the quality of education by integrating the best aspects of face-to-face and online learning such as encouraging active learning, critical thinking, and the development of digital literacy skills, which are essential in a technology-driven world
- **Teacher Preparation:** To maximize the potential of technology in education, teachers must be well-prepared. The GEM Report highlights the importance of governance regulation and teacher preparation for the effective use of technology in education.

10. MULTI-PHASE APPROACH

The implementation of the e-Education strategy necessitates a Multi-phase Approach due to the diverse and dynamic needs of the basic education sector by allowing incremental changes. This approach ensures that the strategy is not a one-size-fits-all solution but tailored to the specific needs of different schools, districts, and provinces. By focusing initially on schools that require the most support, the phased approach ensures that no school, district, or province is left behind, promoting a more equitable distribution of resources and opportunities.

This careful prioritization within the phased approach aligns with the national goals and pre-requisites for success as outlined in the e-Education Strategy, emphasizing the importance

of a structured, output-focused plan with clear roles and responsibilities. Each phase of the implementation builds upon the previous one, creating a sustainable and inclusive educational environment that can adapt and grow with the sector's evolving needs and technologies.

Table 4: Multi-phase Approach

STRATEGIC OUTCOMES	PHASE 1 (2025-2026) LAYING THE FOUNDATIONS	PHASE 2 (2027-2028) INTEGRATION AND EXPANSION	PHASE 3 (2029-2030) SUSTAINABILITY & TRANSFORMATION
1. To provide universal and equitable access to appropriate ICT infrastructure, fit-for-purpose devices, connectivity, and engaging multilingual digital content, enabling all schools, teachers, and learners to benefit from e-education opportunities.	1.1. Expedite the deployment of high-speed internet connectivity to schools via SA Connect project and initiate engagements for the establishment of the Basic Education National Educational Network (BENET).	1.1. Ensure a minimum bandwidth of 100 Mbps and monitor the quality of connectivity at recipient schools of SA Connect. Additionally, set up the necessary infrastructure for BENET implementation.	1.1. Leverage the Basic Education National Educational Network (BENET) to establish a sustainable and scalable high-bandwidth connectivity solution for all schools, ensuring equitable access to educational resources.
	1.2. Implement national transversal procurement for appropriate ICT to streamline procurement and leverage economies of scale.	1.2. Expand the ICT infrastructure to more schools, gradually aiming for a 1:1 learner-to-device ratio.	1.2. Achieve a learner-to-device ratio of 1:1 and commence upgrading as well as replacing devices with newer technologies.
	1.3. Establish a comprehensive policy framework that outlines	1.3. Design and launch a centralized digital repository for storing and managing	1.3. Establish an ongoing programme to promote the

STRATEGIC OUTCOMES	PHASE 1 (2025-2026) LAYING THE FOUNDATIONS	PHASE 2 (2027-2028) INTEGRATION AND EXPANSION	PHASE 3 (2029-2030) SUSTAINABILITY & TRANSFORMATION
	guidelines for creating, adapting, and sharing OER, with a focus on multilingual content, inclusivity, and accessibility.	OER, including state-owned materials.	culture of open licensing and the use of OER as well as monitor the sustainability and impact of OER use in the sector.
	1.4. Develop and launch an online e-catalogue platform for pre-approved free & proprietary educational content	1.4. Develop a standardized framework for the evaluation and selection of free & proprietary digital content resources.	1.4. Maintain and update the e-catalogue platform with new pre-approved free & proprietary educational content.
	1.5. Develop a secure, inclusive, scalable national cloud-based educational platform with a user-friendly interface for accessing e-resources.	1.5. Integrate gamification elements into the educational platform and ensure robust data security measures.	1.5. Analyse data to improve platform features and content as well as ensure ongoing data security and privacy compliance.
	1.6. Improve access to ECD information, resources, and	1.6. Integrate a feature within the ECD Information Hub that	1.6. Implement a feedback mechanism within the ECD

STRATEGIC OUTCOMES	PHASE 1 (2025-2026) LAYING THE FOUNDATIONS	PHASE 2 (2027-2028) INTEGRATION AND EXPANSION	PHASE 3 (2029-2030) SUSTAINABILITY & TRANSFORMATION
	training opportunities as well as foster communication and collaboration among stakeholders by strengthening the ECD Information Hub as a comprehensive resource center. Additionally, enhance virtual support through the ECDmobi app for multilingual outreach.	allows stakeholders to upload and share multilingual resources and success stories, enhancing the collaborative aspect of the platform.	Mobi app to regularly gather user input and continuously update the app with new, relevant content and resources, ensuring it remains a dynamic and useful tool for parents, caregivers, and practitioners.
	1.7. Conduct assessments of ICT needs and challenges in underserved and special schools and commence targeted deployment of ICT infrastructure to underserved and special schools.	1.7. Intensify the implementation of interventions and collaborate with partners to support ICT in underserved communities and special schools.	1.7. Monitor and evaluate the effectiveness of interventions in underserved and special schools

STRATEGIC OUTCOMES	PHASE 1 (2025-2026) LAYING THE FOUNDATIONS	PHASE 2 (2027-2028) INTEGRATION AND EXPANSION	PHASE 3 (2029-2030) SUSTAINABILITY & TRANSFORMATION
2. To develop the **digital skills and competencies of teachers and learners** to be proficient in utilizing ICTs, seamlessly **integrating technology into teaching, and learning within a multilingual context,** and effectively **participating in the digital economy and society (digitally skilled society).**	2.1 Design and pilot customised SACE accredited training modules for diverse ICT proficiency levels of teachers.	2.1 Expand ICT integration training to cover building digital pedagogical knowledge, lesson planning, and technology-enhanced instruction of teachers.	2.1 Embed ICT training into pre-service teacher education programmes and establish a network of ICT mentors.
	2.2 Integrate a foundational digital skills programme into the early childhood development and primary school curriculum and provide opportunities for learners to develop coding and programming skills.	2.2 Expand on the coding skills introduced by incorporating activities that emphasize computational thinking concepts.	2.2 Introduce age-appropriate robotics and electronics into the curriculum for learners.
	2.3 Develop an online TPD platform featuring a curated content library on ICT integration, interactive skill	2.3 Mediate the TPD platform, expand content with advanced modules and case studies, and provide ongoing	2.3 Track usage, teacher progress, and learning outcomes, offer specialized online courses and

STRATEGIC OUTCOMES	PHASE 1 (2025-2026) LAYING THE FOUNDATIONS	PHASE 2 (2027-2028) INTEGRATION AND EXPANSION	PHASE 3 (2029-2030) SUSTAINABILITY & TRANSFORMATION
	development modules, self-assessment tools for skill diagnosis, a community forum for peer support, and conduct a pilot test to gather feedback from diverse teachers.	technical and community support.	certifications, and partner with stakeholders for wider reach and resources.
	2.4 Introduce digital citizenship education into the curriculum focusing on online safety and ethics.	2.4 Strengthen digital citizenship education with a focus on critical thinking and online safety.	2.4 Promote a culture of digital citizenship, privacy, security, and responsible ICT use.
	2.5 Strengthen the PLAYSA in-service online training and resources platform to offer more free online play-based learning training modules for ECD practitioners.	2.5 Develop and integrate new interactive training modules focused on advanced ECD teaching techniques accessible in multiple local languages.	2.5 Establish a continuous professional development program for ECD practitioners, incorporating regular updates and feedback loops to adapt and improve the training content based on

STRATEGIC OUTCOMES	PHASE 1 (2025-2026) LAYING THE FOUNDATIONS	PHASE 2 (2027-2028) INTEGRATION AND EXPANSION	PHASE 3 (2029-2030) SUSTAINABILITY & TRANSFORMATION
			practitioner needs and evolving best practices.
3: To provide high-quality, accessible, and equitable remote education opportunities through online and satellite platforms.	3.1 Establish and publish a comprehensive legal framework for online schools by 2026.	3.1 Support the establishment and growth of high-quality public online schools and blended learning models.	**3.1** Regularly update the regulatory framework for online schools to reflect technological advancements.
	3.2 Establish and manage a dedicated national broadcasting channel for public schools (in collaboration with the public broadcaster).	3.2 Develop online platforms and interactive tools to complement broadcast content and enhance the learning experience.	**3.2** Evaluate and adapt broadcast-based learning programmes based on feedback and data analysis.
	3.3 Develop a comprehensive data privacy policy for online schools and remote learning platforms, aligned with POPIA and other data protection	3.3 Implement cybersecurity measures and educate the education community about online safety.	**3.3** Regularly monitor and audit data security practices in online schools and remote learning platforms (ongoing activity throughout all

STRATEGIC OUTCOMES	PHASE 1 (2025-2026) LAYING THE FOUNDATIONS	PHASE 2 (2027-2028) INTEGRATION AND EXPANSION	PHASE 3 (2029-2030) SUSTAINABILITY & TRANSFORMATION
	regulations.		phases).
4: To foster a culture of innovation and excellence in e-education by promoting creativity, collaboration, and knowledge creation through research, development, evaluation, and dissemination of effective models, tools, and resources that transform teaching and learning experiences, with a focus on supporting MTbBE approaches, pedagogy and resources.	4.1 Launch a campaign to promote the NTA Excellence in Technology-Enhanced Teaching and Learning category, providing recognition and rewards to exemplary teachers.	4.1 Expand mentorship programmes and share best e-learning practices widely.	4.1 Provide mentorship and support to teachers who are implementing new e-learning initiatives.
	4.2 Convene an expert panel to define key principles and develop an e-education innovation framework.	4.2 Implement the e-education innovation framework and evaluate its effectiveness.	4.2 Refine the innovation framework based on feedback and long-term impact assessments.
	4.3 Establish the e-education R&D hub and start conducting research on e-education innovation.	4.3 Evaluate the impact of e-education innovation, focusing on assessing its impact on teaching and learning and other outcomes	4.3 Disseminate effective e-education models and organize conferences to foster a collaborative innovation ecosystem.

STRATEGIC OUTCOMES	PHASE 1 (2025-2026) LAYING THE FOUNDATIONS	PHASE 2 (2027-2028) INTEGRATION AND EXPANSION	PHASE 3 (2029-2030) SUSTAINABILITY & TRANSFORMATION
		such as learner achievement and equity.	
5: Harness ICTs to optimize system efficiency, effectiveness, and accountability, enabling data-driven decision making, robust monitoring and evaluation, and enhanced communication, ultimately leading to improved management and administration as well as better resource allocation and utilization.	5.1 Develop and implement a national EMIS policy and strategy and establish a secure National and Provincial EMIS portal.	5.1 Enhance EMIS interoperability with other government information systems and conduct data quality audits.	5.1 Develop Business Intelligence tools for EMIS and promote self-service capabilities.
	5.2 Review and revise the SA-SAMS software and database to support digital learning and align with current educational standards.	5.2 Develop and deploy a web-based and cloud-hosted version of SA-SAMS and provide comprehensive technical support and training.	5.2 Incorporate advanced digital learning features into SA-SAMS and implement analytical tools for learner performance.
	5.3 Improve access to administrative functions and data for ECD via the eCares (early childhood	5.3 Develop and integrate a dashboard within the eCares platform that allows for real-time tracking and reporting of	5.3 Implement automated data analytics and reporting tools within the eCares platform to provide insights and trends,

STRATEGIC OUTCOMES	PHASE 1 (2025-2026) LAYING THE FOUNDATIONS	PHASE 2 (2027-2028) INTEGRATION AND EXPANSION	PHASE 3 (2029-2030) SUSTAINABILITY & TRANSFORMATION
	administration and reporting system) platform that facilitates online application, review, and registration of ECD programmes.	application statuses and key metrics for ECD programmes.	supporting data-driven decision-making and continuous improvement of ECD programme administration.
	5.4 Develop a secure, robust, user-friendly Grade 1 and 8 online learner admission platforms to enhance efficiency, reduce paperwork, and improve data accuracy and management.	5.4 Gradually roll out the online admission systems and provide technical support and training to staff. Launch a public awareness campaign for parents.	5.4 Update and enhance the system based on feedback and technological advancements as well as integrate the online admission system with other educational management systems.
6: Enhance efficiency of examinations processes by leveraging technology.	6.1 Implement a secure user-friendly online platform for candidate registration and examination application.	6.1 Integrate the platform with existing candidate information systems for verification and efficient data management.	6.1 Enable real-time tracking of registration status and examination schedules.

STRATEGIC OUTCOMES	PHASE 1 (2025-2026) LAYING THE FOUNDATIONS	PHASE 2 (2027-2028) INTEGRATION AND EXPANSION	PHASE 3 (2029-2030) SUSTAINABILITY & TRANSFORMATION
	6.2 Implement a Modernized and AGILE Integrated Examination Computer system for Grade 12 using a Modular approach linked to SASAMS.	6.2 Integrate the IECS into the SASAMS for all Grade assessment	6.2 Enable Real Time Assessment Reporting for all Grades.
	6.3 Gradually implement a secure online system for encrypted distribution of selected exam papers to provinces and eventually individual candidates.	6.3 Use authorized and SSA approved digital rights management (DRM) to prevent unauthorized access and ensure paper security.	6.3 Explore options that enable real-time monitoring of examination paper distribution status.
	6.4 Develop and pilot repository of standardised test items categorised by subject and level of difficulty. Link this with online setting of question papers for NSC examinations	6.4 Analyse the pilot's effectiveness in terms of accessibility, user experience, and data security. Enable teachers to contribute new items and	6.4 Implement a robust online examination platform with features like question randomization, secure browsing, and plagiarism

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	for select subjects, adhering to strict security protocols.	share best practices in assessment development.	detection.
	6.5 Introduce e-marking platforms for efficient and standardized assessment by examiners.	6.5 Develop a system for efficient human marking of subjective questions with online collaboration features between markers.	6.5 Streamline e-marking and automated scoring for standardized assessment.
	6.6 Implement and Exams Monitoring system for all examination related processes,	6.6 Integrate the monitoring system into SASAMS.	6.6 Enable Real Time Monitoring for All Examination Related processes.
	6.7 Use data analytics to monitor and evaluate the effectiveness of the examination process.	6.7 Establish feedback loops to inform policy decisions and strategic planning.	6.7 Identify trends and areas for improvement in education quality through data analytics
7: Driven by the ongoing review of relevant policy	7.1 Establish a **task force** to oversee the policy review	7.1 Conduct regular policy audits, monitor technological trends,	7.1 Test and evaluate new ICT solutions and practices and

STRATEGIC OUTCOMES	PHASE 1 (2025-2026) LAYING THE FOUNDATIONS	PHASE 2 (2027-2028) INTEGRATION AND EXPANSION	PHASE 3 (2029-2030) SUSTAINABILITY & TRANSFORMATION
frameworks, with a focus on translating high-level plans like the White Paper into clear and actionable policies that support mother-tongue education, South Africa's e-education system will be able to harness emerging technologies and navigate the dynamic digital landscape, transforming teaching and learning for all.	process, including the development of review criteria and metrics.	and engage stakeholders in policy dialogue to ensure policies remain current.	collaborate with research institutions to align policies with the revised e-education policy and emerging technologies.
	7.2 Conduct comprehensive reviews of new national and global policies, plans, frameworks, and commitments impacting on e-Education implementation in South Africa and draft revisions to the white paper on e-Education launched in 2004.	7.2 Develop a comprehensive, future-proof e-education policy that is aligned with national and global commitments, incorporating the latest technological trends.	7.2 Update existing policy frameworks based on insights from ongoing reviews and consultations with national and global policies impacting e-Education.

11. KEY CONSIDERATIONS FOR A VIABLE E- EDUCATION IMPLEMENTATION MODEL

The potential for e-education to transform learning in South Africa is undeniable. However, for this potential to be realized, a well-structured implementation plan is crucial. The following key considerations need to be addressed to ensure a viable and sustainable e-education rollout across the country:

11.1 Resource access and equity.
11.2 Building teacher and learner capacity.
11.3 E-Content and e-assessment.
11.4 System efficiency and sustainability.
11.5 Collaboration and support.

Table 5: Key Considerations

11.1 RESOURCE ACCESS AND EQUITY	
Key Consideration	**Proposed Action**
Mitigating Digital Divide	• Prioritise special schools, rural, small, or non-viable schools and those offering technology related subjects mitigate existing resource challenges and multigrade teaching.
Connectivity	• Collaborate with the Department of Communication and Digital Technologies to inform the implementation of SA Connect educational targets, bandwidth, and timeframes. • Conduct real-time monitoring & reporting on type, quality & quantity of connectivity at all schools.
ICT Hubs (ICT resource centres)	• Set up ICT hubs to provide learners, teachers, and community with access to computers, the internet, digital resources as well as serve as training centres. • Access to TPD online platform for improved classroom practice and continued development and diagnostic self-assessments.
Blended Device Provision Model	• Combine state-funded device deployment with a Bring Your Own Device (BYOD) policy, complemented by

	affordable device packages and subsidized data plans. • Inclusive Technology: Adopt assistive technologies and accessible digital platforms to accommodate learners with disabilities and special educational needs.
Digital Content Accessibility	• Develop a centralized online platform with curriculum-aligned content in multiple languages and offline options.
11.2 BUILDING TEACHER AND LEARNER CAPACITY	
Teacher Empowerment	• Provide continuous professional development for teachers to integrate technology into their pedagogy and to support differentiated instruction & MTbBE. • Develop a Teacher Professional Development online platform to improve classroom practice, facilitate continued development and diagnostic self-assessments of teachers.
Digital Literacy	• Implement programmes to improve digital literacy among learners, teachers, and the community, enabling effective use of e-education resources.
11.3 E-CONTENT AND E-ASSESSMENT	
Open Education Resources (OER)	• Utilize Open Educational Resources (OERs) including state-owned textbooks to reduce cost barriers for learners and schools.
Content Localization	• Develop and curate e-learning content that is culturally relevant and available in multiple languages to support MTbBE.
e-Assessment	• Gradual introduction and implementation of digital assessment tools and processes
11.4 SYSTEM EFFICIENCY AND SUSTAINABILITY	
Resilient and Flexible Education System	• Gradually establish a resilient and flexible education system that can swiftly adapt to crises such as COVID-19, ensuring continuity in learning and accessibility for all learners.
Remote Education	• Promote remote learning opportunities to provide a more accessible and flexible education system.

e-Administration	• Modernization and integration of information systems for a more transparent, accountable, and efficient education system.
Online Learner Admission Platforms	• Develop online admission platforms to streamline the learner admission process, reduce paperwork, improve data accuracy, and support efficient educational administration.
Monitoring and Feedback	• Establish a system for regular assessment and feedback to monitor the progress of e-education implementation and to make informed improvements.
Adaptability	• Design flexible provincial implementation models that can evolve with technology and educational needs.
11.5 COLLABORATION AND SUPPORT	
Stakeholder Collaboration	• Foster partnerships between government, private sector, civil society academia, and international organisations to support and fund e-education initiatives.
Community Engagement	• Involve parents, community leaders, and local organisations in supporting e-education initiatives.
Policy Alignment and Support	• Formulate aligned and supportive policies that promote e-education and protect the rights of all learners to access quality education.

12. STRATEGY IMPLEMENTATION

The vision of the e-education strategy must be translated into actionable steps for it to become a reality. This will require the development of implementation plans at all levels of the basic education system from national, provincial, district to schools, each giving expression to the outlined strategic outcomes.

12.1 The Governance Framework

This framework is essential for outlining processes, and structures that will guide decision-making and accountability in respect to the implementation of e-education in the basic education sector. This will ensure the following:

- Policy alignment to broader educational policies and goals of government.

- Accountability in line with defined roles, responsibilities, and reporting structures hence holding stakeholders accountable for their actions and ensuring transparency.
- Resource allocation for supporting e-education activities (financial, human, and technological).
- Quality assurance by outlining quality standards, monitoring mechanisms, and evaluation processes.
- Stakeholder engagement by facilitating collaboration among role players at various levels.
- Risk management by identifying risks and mitigation strategies, hence minimizing potential challenges during e-education implementation.

12.2 Governance Structures and Roles

Heads of Education Departments Committee (HEDCOM)

- Provides strategic oversight and ensure policy coherence across provincial departments.
- Establishes and supports management structures for e-education implementation.
- Approves national and provincial e-education implementation plans, guidelines, and reports.
- Monitors and evaluates progress of e-education implementation against strategic objectives.

Office of the Director General (ODG)

- Provides overall leadership and strategic direction for the e-Education strategy.
- Ensures alignment with national education policies and priorities.
- Approves high-level plans, major initiatives, budgets, and resource allocations
- Reports progress to the Minister of Basic Education.
- Facilitate inter-departmental coordination and stakeholder engagement.

e-Education HEDCOM Subcommittee

- Coordinates with provincial e-Education implementation units.
- Develops detailed implementation plans and guidelines
- Acts as the main advisory body on the e-Education strategy.
- Makes recommendations for consideration by HEDCOM
- Monitors implementation progress and address challenges
- Facilitates the development and dissemination of best practices and standards.

ICT Steering Committee

- Monitors and reports on the implementation of e-Education initiatives against approved project plans.
- Ensures effective governance and oversees project execution.

- Provides oversight on strategic alignment, value management, risk management and performance management.
- Oversees procurement and deployment of ICT resources.
- Ensure data security and privacy compliance.

12.3 The Delivery Framework

The Government Technical Advisory Centre (GTAC), which operates under the National Treasury developed the GTAC PMO model. This model refers to the Programme and Project Management (PPM) Office Set-Up Guide/Framework, which was rolled-out in all national departments and the nine provinces.

The e-education strategy proposes the adoption of the GTAC PMO delivery model as the vehicle for its implementation across provinces. This model will streamline project management practices, ensuring effective coordination, value driven incremental implementations and successful project outcomes. The model provides the following:

- A GTAC PMO Toolkit which provides documentation, tools, and templates for managing projects from start to finish.
- The PMO acts as a central hub (focal point) for collating and processing status reports across multiple projects. It facilitates early issue identification and reporting to sponsors and senior management.
- An integrated project management model within the public service, aligning with results-based management (RBM) principles and emphasizes quality assurance, control, and accountability.

The approach adopted for the PPM Framework is based on the Project Management Body of Knowledge (PMBOK) principles, ensuring alignment with international standards but customised to suit the South African public sector. The PMBOK provides the foundational knowledge for effective project management, and the GTAC PMO model will complement it by offering practical guidance on PMO setup and management. Implementation Plan

12.4 Implementation Plan

The practical translation of the e-education strategy into its vision will require PEDs to develop implementation plans that will give expression to a national implementation plan. All the implementation plans (national and provincial) with form part of the strategic masterplan that will coherently deliver the strategy.

13. FUNDING MODEL

The e-education strategy identifies funding as a key enabler of e-education implementation. Currently there is a huge disparity in funding between affluent and rural provinces, which is manifested in the different levels of implementation across provinces. Therefore, funding options must take cognisance of the context of each province in respect to available funding sources, backlog, competing priorities and demography if the expanding digital divide between provinces is to be arrested.

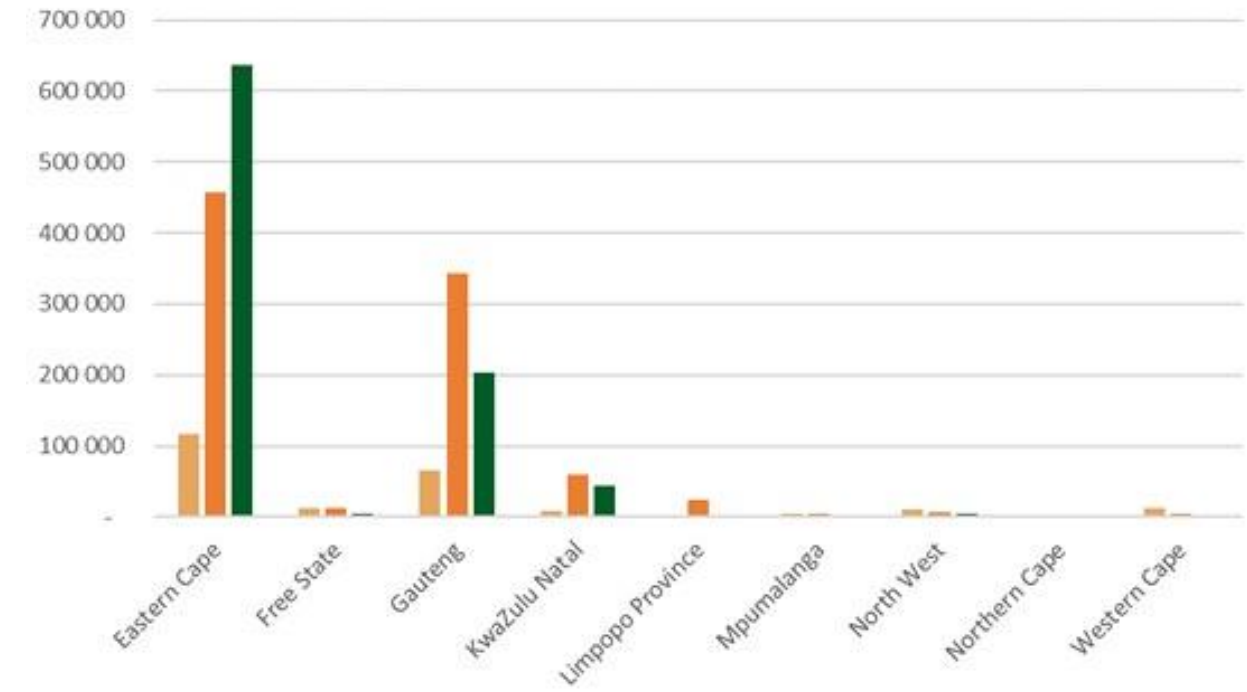
The Operation Phakisa ICT in Education main lab held in 2015 conducted a comprehensive costing analysis. The combined funding of all initiatives for the rollout of ICT in Education over the 5-year period was estimated at R130 billion. The largest portion, at 74% of the total cost, was for the procurement and support of all required ICT infrastructure. The DBE, along with the support of key sister departments, the private sector, and innovative funding models were identified as critical to the success of the programme.

13.1 National Treasury Spending Review on ICT in Education (2017 – 2020)

According to the 2020 report by the Government Technical Advisory Centre (GTAC), ICT spending under the Public Ordinary School programme amounts to R2 billion, which constitutes 38% of the total ICT spending. Notably, all ICT purchases made under this programme are assumed to be exclusively for teaching and learning purposes

Figure 3: Expenditure on ICT under Public Ordinary Schooling 2017 – 2020

Public Ordinary School



Source: Government Technical Advisory Centre (GTAC) Report 2020

The overall expenditure on ICT across provinces remains low despite the higher spending in some provinces and accounts for only 0.7% of the total education budget. In per capita terms, this translates into an average of R144 per learner over the three-year period.

The National Treasury spending review on ICT in education also revealed a large ICT spending disparity between provinces and expressed concerns over its long-term implication on the digital divide and educational outcomes in implicated provinces. It recommended:

- A need for greater policy and implementation direction from National Department; and
- Greater value for money through procurement e.g. transversal contracts

13.2 Possible funding models for e-education implementation in South Africa

The majority of PEDs are often financially challenged when it comes to implementing technology in education and the following funding models could be explored:

Government Budget Allocation: The South African government can allocate a portion of its annual budget specifically for e-education initiatives. This ensures sustained funding and allows for strategic planning and resource allocation.

MST Conditional Grant: ICT Allocation: The portion of the MST Conditional Grant allocated for deploying ICT resources to recipient schools could be increased and criteria

expanded to include more schools such as all Quintile 1 to 3 schools in historically disadvantaged communities.

Public-Private Partnerships (PPPs): Collaborating with private companies, foundations, and NGOs can bring additional resource e-education projects s. These partnerships can involve financial contributions, technology provision, or expertise sharing. PPPs leverage both public and private sector strengths to enhance e-education.

Corporate Social Responsibility (CSR): Companies operating in South Africa, particularly those in the technology sector, may be interested in sponsoring e-education initiatives as part of their corporate social responsibility (CSR) efforts. Sponsorship can include funding for technology infrastructure, educational programmes, and community outreach initiatives.

LTSM Budget Allocation: Schools should leverage on the LTSM budget allocation to procure e-LTSM resources as outlined in the National guidelines for the procurement of core and supplementary e-LTSM or digital resources. This is particularly applicable to schools with a consistent track record of a high print textbook retrieval rate. Schools must select all curriculum-aligned textbooks from the approved national e-catalogue.

Donor Funding and Grants: Seeking grants from international organisations, development agencies, and philanthropic foundations can support e-education projects. These funds can be used for infrastructure development, content creation, and capacity building.

Crowdsourcing and Crowdfunding: Engaging the public through crowdfunding platforms can raise funds for specific e-education projects. Community involvement fosters ownership and commitment.

Research Grants and Collaborations: Encouraging universities and research institutions to collaborate on e-education research can attract research grants. These funds can drive innovation and evidence-based practices.

14. CONCLUSION

South Africa's e-education strategy outlines a comprehensive roadmap to address the challenges identified in the 2023 GEM report and achieve goals set by national initiatives such as the Action Plan to 2024, National Development Plan, and SDG4. By ensuring equitable access to technology, fostering digital literacy, establishing a robust framework for online learning, and promoting continuous innovation, this strategy aims to:

- **Bridge the Digital Divide and Empower All Learners and Teachers:** The strategy prioritises providing universal access to affordable and reliable technology, ensuring that no learner or teacher is left behind due to lack of resources.
- **Transform Teaching and Learning through Seamless ICT Integration:** By equipping learners and teachers with digital tools and resources, the strategy enhances learning outcomes, skills development, and lifelong learning.
- **Optimize Education Systems for Efficiency, Effectiveness, and Data-Driven Decision-Making:** The strategy emphasizes data-driven approaches to improve educational processes, resource allocation, and overall system efficiency.
- **Enhance Examination Processes and Resource Allocation:** Leveraging technology, the strategy aims to streamline examination processes and allocate resources effectively.
- **Foster a Dynamic E-Education Environment:** The strategy adapts to emerging technologies, transforming the educational landscape for all South Africans.

Regular policy review and translation of high-level plans into actionable steps will ensure South Africa's e-education strategy remains relevant and successful in the ever-evolving digital world. Collaborative efforts involving national and provincial education departments, the private sector, civil society, and development partners are crucial for achieving these goals. Ultimately, this strategy contributes to shaping the future of South African basic education, aligning with the National Development Plan, the Department of Basic Education's Action Plan to 2024, the White Paper on e-Education (2004), and Sustainable Development Goal 4 (SDG 4). It prepares South African learners for the demands of the digital age and contributes to the overall development of the nation.

15. REFERENCES

Commission, N. P. (2012). *National Development Plan 2030: Our Future - Make it Work.* Cape Town: Government of the Republic of South Africa.

Commission, National Planning. (2013). *National Develpment Plan: A Vision for 2030.* Pretoria: Government of the Republic of South Africa.

DBE & DHET. (05 April 2011). *Integrated Strategic Planning Framework forTeacher Education and Development in South Africa.* Pretoria: Government of the Republic of South Africa.

DBE. (2013, September 11). e-Education Implementation Plan. *e-Education Implementation Plan for the Basic Education Sector*. (D. o. Education, Ed.) Pretoria, Gauteng, South Africa. Retrieved July 09, 2019, from https://slideplayer.com/slide/5273891/

Department of Basic Education. (2004, September 02). White Paper on e-Education. *Government Gazette No. 26762*, pp. 03-45.

Department of Basic Education. (2015). *Action Plan to 2019: Towards the Realisation of Schooling 2030.* Pretoria: Government of the Republic of South Africa.

Department of Basic Education. (26 August 2004). *White Paper on e-Education.* Pretoria: Government of the Republic of South Africa.

Department of Communications. (2014, January 24). National Integrated ICT Policy Green Paper. *Government Gazette No. 37261*, pp. 03-100.

Department of Monitoring and Evaluation. (2019, July 09). *Operation Phakisa Education Lab*. Retrieved from Operation Phakisa: ICT in Education: https://www.operationphakisa.gov.za/operations/Education%20Lab/Pages/default.aspx

DoC. (2013). *South Africa's Broadband Policy.* (D. o. Communications, Ed.) Pretoria, Gauteng, South Africa: Government of the Republic of South Africa.

DPSA. (2012). *Public Service Corporate Governance of ICT Policy Framework.* Pretoria: Government of the Republic of South Africa.

Norrish, D. (2019, July 08). *Pushing EdTech evidence past the era of oral tradition*. Retrieved from domnorrish.com: http://domnorrish.com/?p=510

Ramaphosa, C. M. (February 2019). *State of the Nation Address.* Cape Town: The Presidency.

Research Unit. (26 February 2018). *Analysis of Basic Education Report on the ICT Rollout.* Cape Town: Parliament of the Republic of South Africa.

United Nations . (2019, July 08). *About the Sustainable Development Goals*. Retrieved from Sustainable Development Goals: https://www.un.org/sustainabledevelopment/sustainable-development-goals/

Reference Documents Consulted

The Constitution of the Republic of South Africa Act, 1996 (Act No. 108 of 1996)

The National Education Policy Act, 1996 (Act No. 27 of 1996)

The South African Schools Act, 1996 (Act No. 84 of 1996)

The Promotion of Access to Information Act, 2000 (Act No. 2 of 2000)

The Electronic Communications and Transactions Act, 2002 (Act No. 25 of 2002)

Department of Education (2004). Transforming Learning and Teaching through Information and Communication Technologies (ICT) White Paper 7 of 2004

Human Resources Development Strategy for South Africa (HRD-SA)

Department of Basic Education Minimum Information Security Standards

Protection of Personal Information Act No. 4 of 2013

Promotion of Administrative Justice Act 3 of 2000

Corporate Governance of Information Communication and Technology Policy Framework.

National Education Information Policy (NEIP).

The National Development Plan (Vision 2030 Policy Framework)

Operation Phakisa ICT in Education Lab Resolutions

National Integrated Information Communication Technology Policy Green Paper 2008 e-Education Needs Analysis

Department of Public Service and Administration (November 2012). Public Service Corporate Governance of Information and Communication Technology Policy Framework

Department of Telecommunications and Postal Services. South Africa's Connect (6 December 2013)

Department of Basic Education (May 2014). e-Education Plan, Internal Draft Document.

Department of Basic Education (November 2012). Implementation Strategy for e-Education in South Africa: 2013 – 2015, Internal Draft.

Department of Telecommunications and Postal Services (2014), National Integrated ICT Policy, Green Paper vol 583

Department of Basic Education (2015), Action Plan to 2019 towards the Realisation of Schooling 2030

Department of Basic Education and Department of Planning, Monitoring and Evaluation (October 2015), Operation Phakisa ICT in Education Final Report

Professional Development Framework for Digital Learning

Integrated Strategic Planning Framework for Teacher Education and Development in South Africa 2011-2025

South African Government. (2024, May 31). National Data and Cloud Policy. Government Gazette, No. 50741. https://www.michalsons.com/blog/national-data-and-cloud-policy-in-south-africa-draft/49239

Western Cape Education Department (WCED): The WCED website offers a brief overview of the project: WCED: The Khanya technology in education project

Government Technical Advisory Centre (GTAC) (2021). ICT in Basic Education Spending

Review Report. https://www.gtac.gov.za/pepa/wp-content/uploads/2021/11/ICT-in-Basic-Education-Spending-Review-Report.pdf

Department of Social Development, Republic of South Africa. (2015). National Integrated Early Childhood Development Policy. Pretoria: Department of Social Development.