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Policy Consideration on the Establishment of a Digital Education Policy Which Prepares Zimbabwean Learners for the 21st Century Digital Economy

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Abstract:- Digital revolution had taken over the 21st century. ICT technology had conquered many households across the world and has a great impact on children and young people and how they access information, communicate and learn. Modernization has pushed the education system to incorporate the 4th industrial revolution as many students find it flexible and less time consuming. The ongoing advances in educational technology such as laptops and mobile devices are providing the end user more flexibility in accessing and controlling the creation and sharing of knowledge. Information can be sent out or received in the comfort of one's personal space. Digital revolution saves time, transport and resources. It also lessens the burden faced by educational institutions to facilitate lectures or sermons. The most critical aspect which should be adopted is shifting from the previous/old education system which did not accommodate much of digital learning to implementing an innovative refined system where new knowledge can be created and passed for educational purposes through ICT devices. Digital tools are supposed to be used for more than just homework but changing the world of education and work.

I. INTRODUCTION

The researcher established that there was no digital education policy for Zimbabwe which prepares learners for the 21st century digital economy skills. Through this research paper, the study seeks to recommend policy considerations that focuses on the digital transformation of the education sector in line with the demands of the digital economy.

The digital economy had taken centre stage in Zimbabwe's economy in line with the demands of the 21st digital economy and there is need to come up with a robust education policy to address issues of digital inclusion, affordability, digital infrastructure, digital literacy, provision of digital skills, provision of digital services and the need to close the rural-urban divide. The digital economy result from billions of online connections among people, businesses, devices, data, and processes. In Zimbabwe, the digital economy is still in its nascent stages due to infrastructural, financial, and political challenges. However, there is growing recognition of the digital economy's role in transforming traditional industries and driving economic development.

Effective policies are central to any digital transformation effort. Chitanana, L. (2012) in his study *"Policy challenges in promoting e-learning in Zimbabwe's higher education,"* noted that Zimbabwe's education policies have been slow to incorporate digital learning. He argued that policymakers must adopt comprehensive strategies that focus not only on technology acquisition but also on curriculum development and teacher training in digital literacy. Chitanana recommends that the government partner with the private sector to enhance investment in digital education infrastructure.

Globally, Unwin, T. (2009) in *"ICT4D: Information and Communication Technology for Development,"* discusses the role of ICT in advancing education in developing countries. Unwin emphasizes the importance of policies that support digital inclusion and infrastructure development, both of which are essential for countries like Zimbabwe to build a robust digital economy.

- *Problem Statement*

The current education policy does not adequately address the demands of the 21st century digital economy. Policy and practice need to evolve to meet the demands of the rapidly changing digital global landscape workforce that can thrive in a digital economy. The existing teacher training programs in Zimbabwe do not sufficiently integrate digital literacy and skills necessary for educators to effectively facilitate digital learning. This gap hinders the ability of the education system

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to adapt to the 4th Industrial Revolution as teachers are not prepared to use digital tools or foster digital literacy among students. The current educational policy in Zimbabwe does not adequately address the need for comprehensive digital infrastructure that is essential for participating in the 21st-century digital economy. This lack of infrastructure disproportionately affects rural areas, limiting access to digital learning tools and resources. As a result, the education system is ill-equipped to respond to the demands of the 4th Industrial Revolution, leading to a significant digital divide and reduced access to connectivity for students and customers which limits social and economic development opportunities. Briefly stated the challenges are as follows;

- Limited digital infrastructure particularly in rural areas to provide connectivity for students and customers. Inadequate internet connectivity particularly in rural areas and insufficient access to digital devices in schools hinder the development of digital skills among students. Many schools lack the necessary infrastructure, such as computers, tablets, and reliable power sources making it difficult to integrate digital learning into the curriculum.
- Inadequate teacher training in digital literacy. Teachers often lack the necessary training to effectively use digital tools and platforms thereby limiting their ability to teach digital skills. The current teacher training programs do not sufficiently emphasize digital literacy, leading to a gap in the delivery of digital education.
- Curriculum gaps in Digital Skills and 21st Century Skills Competencies. The existing curriculum does not adequately incorporate digital skills or 21st-century competencies, such as critical thinking, problem-solving and creativity which are essential for success in the digital economy. This leaves students unprepared for the demands of modern workplaces.
- Economic barriers to accessing Digital Education. The high cost of digital devices, data, and other necessary resources makes it difficult for many students and their families to access digital education. Economic disparities exacerbate the digital divide particularly in under-privileged communities.
- Insufficient Industry-Education Linkages to drive digital education. There is a disconnect between the education system and the needs of the digital economy. Educational institutions often do not have strong partnerships with industries that could provide insights into the skills required for future jobs leading to a mismatch between the skills taught and the skills needed in the workforce.
- Lack of policy coordination and policy support for Digital Education. Without a clear policy framework, efforts to acquire digital skills for the 21st century education are often fragmented and inconsistent.

II. LITERATURE REVIEW

The word "technology" has significant implications in numerous domains, including education, in the twenty-first century. This is a result of the fact that most nations today employ technology as a means of knowledge transfer. Currently, technological integration has undergone advancements and revolutionized our society, completely altering the way people live, work, and think (Grabe, 2007). This means that ICT integration in the curriculum needs to be taken into consideration by schools and other educational institutions that aim to prepare students for life in "a knowledge society" (Ghavifekr, Afshari & Amla Salleh, 2012).

Education 5.0 is a policy that stands for an evolution of educational approaches. It is influenced by the advancement in technology and the changing needs of the digital era. It mainly focuses on preparing students for the opportunities and challenges of the 21 st century. The policy encourages the notion of lifelong learning, critical thinking, and problem-solving. It recognizes the need for a continuous development of skills and adaptation in a constantly changing environment. Its main focus is on the development of digital literacy skills to enable students to survive the digital world effectively (Muzira and Bondai 2020).

Chirisa, M., Matamanda, A. R., & Mazhindu, E. (2020) in their study *"The digital economy and its prospects in Zimbabwe"* provide a detailed analysis of Zimbabwe's digital transformation. They argue that despite slow progress, the adoption of mobile money services such as Ecocash indicates a promising trend in the country's journey toward a digital economy. The authors also highlight challenges, including inconsistent electricity supply, poor internet infrastructure, limited digital literacy and,high internet cost.

Mhlanga, D. (2021), in his research titled *"Digital Economy in Developing Countries: An Analysis of Challenges and Opportunities for Zimbabwe,"* emphasized the need for strong government policies and investment in digital infrastructure to drive the digital economy forward. Mhlanga discussed how high internet costs and inadequate infrastructure, especially in rural areas, have hindered Zimbabwe's ability to participate fully in the global digital economy.

Kamba, D. & Ngwenya, C. (2017) contributed with their paper on *"ICT and economic development: The role of technology in Zimbabwe's economic progress."* They argue that a comprehensive ICT strategy must be part of the government's efforts to create a digital economy, focusing on mobile internet expansion and ICT skills training to integrate a larger portion of the population into the digital economy..

Chiumbu, S. (2012) in her work *"Mobile phones and the internet in Zimbabwe: Implications for youth and political participation,"* examined how high mobile phone penetration in Zimbabwe offers an entry point for developing the digital economy but she cautions that internet access remains expensive and limited. She suggests that government policies should focus on making digital services affordable and accessible, particularly in rural areas where the digital divide is most prominent.

III. CHALLENGES OF THE DIGITAL ECONOMY IN ZIMBABWE

Ndawa, B. (2018) contributed on *E-learning in Zimbabwe: The opportunities and challenges.* This article focused on the education sector's digital transformation, particularly the issues of digital inclusion and affordability and how these affect Zimbabwe's readiness for a digital economy.

Munyoka, W., & Maharaj, M**.** (2019) researched on *Exploring the adoption of ICT in Zimbabwean SMEs: A case of small-scale enterprises in Bulawayo. African Journal of Business and Economic Research*, 14(2), 89-109.The study concluded that poor infrastructure, including unreliable power and weak internet connectivity, hampers ICT adoption in Zimbabwean small businesses and limits their ability to participate in the digital economy.

Chavhunduka, D., & Kaijage, E. (2017**)** in their article *Telecommunications and the development of Zimbabwe's digital economy* cited Zimbabwe's outdated telecommunications infrastructure which restricts digital connectivity which is essential for businesses and individuals to engage with the digital economy. Mahlangu, M. (2021) article on *The Role of Internet Access in Boosting Economic Growth in Zimbabwe* addressed the significant disparities in internet access between urban and rural areas, as well as the infrastructural investment required to level the playing field for economic growth in the digital space.

Regulatory challenges in Zimbabwe's digital economy were also cited as key to the transformation of the digital economy .Moyo, C., & Masuka, N. (2021**)** in their article *Policy and regulatory challenges in Zimbabwe's digital economy: A review of ICT governance frameworks*, highlighting the slow pace of regulatory reform and critiqued the current ICT policies in Zimbabwe and suggest how government-led reforms and initiatives can create a more enabling environment for the digital economy.The World Bank. (2021) in their *Digital Economy for Zimbabwe: Diagnostic Report* outlined the structural and regulatory challenges Zimbabwe faces in developing its digital economy. It provides an in-depth look at policy gaps and the need for reform to enable digital inclusion.

Digital literacy and skills gap is a major challenge. Gumbo, M. (2019) in the article *ICT integration in Zimbabwean education: Challenges and prospects*, discussed how digital literacy, especially among educators and students, remains a significant challenge in Zimbabwe highlighting the lack of training and resources which exacerbates the digital divide. Mpofu, M. & Sukumani, M. (2020**)** in the article *Digital literacy challenges in Zimbabwe's public sector: A case of teachers in rural areas*, provided a detailed analysis of the digital skills gap in Zimbabwe focusing on educators in rural areas and how this limits the effective integration of technology into the education system and, by extension, the broader digital economy.

The other challenge highlighted had to do with economic and financial barriers. Chiumbu, S. (2012)'s paper on. *Mobile phones and the internet in Zimbabwe: Implications for youth and political participation.* highlighted the high cost of internet services in Zimbabwe which limits widespread adoption, particularly among the youth and in low-income communities. The study discusses how this restricts participation in the digital economy.

Chiumbu [2012] and Chipunza[2020]'s papers discussed the rise of fintech services such as Ecocash and OneMoney, which have been pivotal to Zimbabwe's digital economy. However, the authors highlight challenges such as regulatory issues, cybersecurity risks, and financial inclusion barriers which limit potential for transforming the digital economy.

The researchers also examined how mobile phones and the internet can either bridge or exacerbate the digital divide in Zimbabwe with a focus on rural versus urban disparities in access to digital technologies.

Mpofu, A.C., Mpofu, F.Y., Mantula, F. and Ndlovu, S., 2024 in *Challenges and Opportunities for Rural Communities* explored how the digital divide affects access to digital services, education and economic opportunities and suggested government interventions to reduce the divide.

Moyo, P, & Mzezewa, F. *(2012)* analyzed *The Impact of Power Shortages on Zimbabwe's Digital Economy* due to unreliable power supply on the digital economy and the growth of ICT services in Zimbabwe. They discuss alternative energy solutions such as solar power that could help mitigate these challenges. **Gumbo, S. (2020)** analyzed *Alternative Energy Solutions for the Digital Economy: Solar Power for Rural Zimbabwe* by focusing on alternative energy solutions like solar energy to support the development of the digital economy by providing a consistent power supply for ICT infrastructure in rural areas.

Chikomo (2021**)** explored the *Cybersecurity Challenges in Zimbabwe's Emerging Digital Economy.*, particularly in fintech and e-commerce. The author recommends stronger regulatory frameworks and public awareness campaigns. Mlambo, P., & Mudimu, G. (2020) in their article on *Trust and Security in Zimbabwe's Digital Economy: Implications for E-Commerce and Online Transactions* discussed the risks posed by weak cybersecurity measures and lack of consumer protection.

These sources provide comprehensive insights into the various challenges Zimbabwe faces in building a sustainable digital economy, ranging from infrastructure deficiencies to policy barriers and digital literacy gaps. The challenges also offer a mix of empirical data and comparative studies, which could help inform strategies to overcome these challenges.

The integration of digital technology in education is crucial for developing a workforce capable of thriving in the digital economy. Despite the global trend toward digital education, Zimbabwe has been slow to adapt due to resource constraints and infrastructural challenges.

Gumbo, M. (2019) in his paper *"ICT integration in Zimbabwean education: Challenges and prospects,"* explores how schools in Zimbabwe had started adopting digital tools to enhance learning but face considerable challenges, such as insufficient ICT infrastructure, teacher preparedness, and electricity shortages. He argues that for Zimbabwe to compete in the global digital economy, the government must prioritize investments in ICT education, especially in rural schools.

Ndawa, B. (2018) also addressed digital education in her article *"E-learning in Zimbabwe: The opportunities and challenges. "*by highlighting the potential of e-learning in improving access to education, especially in remote areas. However, the lack of a coherent national strategy on digital education, along with infrastructure limitations, restricts its effectiveness. Ndawa suggests that the government must formulate policies that make e-learning tools available to all schools and include training for teachers on how to use these tools effectively.

Globally, Selwyn, N. (2014) in his book *"Digital Technology and the Contemporary University: Degrees of Digitization,"* discusses the global shift toward digital education and how developing countries like Zimbabwe can benefit by tailoring global strategies to local contexts. Selwyn (2014) emphasizes that digital education is not just about providing access to technology but about integrating it meaningfully into the curriculum to improve learning outcomes.

- *Comparative Studies of Digital Education in Africa*

A review of other African nations offers insights into how Zimbabwe might advance its digital education agenda. Nawaz, A., & Kundi, G. M. (2010) in their article *"Challenges of e-teaching: Contemporary paradigms and strategies in higher education,"* analyze digital education strategies in Africa, noting that countries such as Kenya and Rwanda have made significant strides by integrating ICT in their educational policies. Kenya's national ICT strategy, for example, focuses on expanding internet access in schools and providing teacher training in digital skills, which could serve as a model for Zimbabwe.

Mutula, S. M. (2011) in *"Digital Divide and Economic Development: Case Studies from Sub-Saharan Africa,"* argues that a lack of digital infrastructure and education is preventing many African countries from participating fully in the global digital economy. However, initiatives like Rwanda's One Laptop per Child program demonstrate how even low-resource countries can use targeted ICT investments to revolutionize education. This study suggests that Zimbabwe could adopt similar low-cost, high-impact initiatives to improve digital literacy and prepare students for the digital economy.

- *The Role of Policy in Advancing Digital Education and the Economy*

Effective policies are central to any digital transformation effort. Chitanana, L. (2012) in his study *"Policy challenges in promoting e-learning in Zimbabwe's higher education,"* noted that Zimbabwe's education policies have been slow to incorporate digital learning. He argues that policymakers must adopt comprehensive strategies that focus not only on technology acquisition but also on curriculum development and teacher training in digital literacy. Chitanana recommends that the government partner with the private sector to enhance investment in digital education infrastructure.

Globally, Unwin, T. (2010) in *"ICT4D: Information and Communication Technology for Development,"* discussed the role of ICT in advancing education in developing countries. Unwin emphasizes the importance of policies that support digital inclusion and infrastructure development, both of which are essential for countries like Zimbabwe to build a robust digital economy in order to fully participate in the 4th Industrial Revolution.

- *Research Objectives*

- Design a policy framework for establishing a digital education policy which addresses the demands of the 21st century digital economy.
- Provide policy recommendations to the Government of Zimbabwe which enhances the development of digital education policy for the 21st century digital economy.
- Provide a framework of evaluating the policy framework designed

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IV. RESEARCH METHODOLOGY

The study carried a desk review of policies in place in the education sector in Zimbabwe to contextualize the issues and to establish the uptake and state of digital education. In addition to this, a qualitative interview was carried out with key stakeholders involved in policy making relating to the education sector, the science and technology sector and the business sector to establish what was possible given the unique circumstances of Zimbabwe's political and economic situation. Key experts in the ITC industry in the public sector and in the private sector were also consulted to establish what was possible given the gaps existing in digital education and digital economy.

V. ZIMBABWE GOVERNMENT POLICY CONSIDERATIONS ON DEVELOPING A DIGITAL EDUCATION POLICY FOR THE 21ST CENTURY DIGITAL ECONOMY

❖ *Introduction*

The digital education policy should follow the following proposed model if it is to meet the demands or needs of the 21st century digital economy**;**

A. Rationale for the Digital Education Policy;

The digital education policy, in its preamble, should capture the following key issues;

- The importance of effective development and deployment of a digital education policy to the development of relevant digital infrastructure and technologies, development of appropriate digital curriculum, education of teachers and learners who are knowledgeable of digital skills and ultimately the development of a robust digital economy which facilitates effective participation in the 4th Industrial Revolution.
- Development of human resources capable of surviving and competing effectively in the 21st century digital economy as a result of digital skills development. Policy to emphasize how school learning and lifelong learning takes place through continuous adaptation of skills to the changing digital landscape.
- Development of the digital education policy which is aligned to the digital economy of Zimbabwe, the region and globally to ensure Zimbabwe fully participates in the 4th Industrial Revolution
- The importance of digital policy coordination and policy support in the development, implementation and evaluation of the policy to realize its national objectives.
- The requirement of continuous policy review to ensure that it is meeting the objectives of the digital economy.

B. Development of ICT Infrastructure

Development of ICT infrastructure that bridges the rural-urban divide in schools and in the economy is key. The strategy could be achieved by incentivizing all Internet Service Providers to compete for the national business of service provision in schools and communities [TelOne, Econet, Liquid Telecoms, NetOne Cellular, Telecel, Powertel Communications, Africom among others] .These companies can be given tax rebates on importing equipment used for the development of digital education infrastructure say for 10 years to ensure the nation fully embraces the digital economy. The policy should include the following strategies;

- Develop a strategy of attracting Internet Service Providers[ISPs] into schools, communities, rural and urban areas
- Equip schools, libraries and Community Development Centres with infrastructure such as computers, tablets, reliable power sources such as solar power at subsidized prices by the government to ensure educational resources are accessible round-the-clock. The focus of government policy should be to support digital inclusion for all members of society.
- Seek funding for rural broadband infrastructure from the private sector in partnership with International Financial Institutions and donor community. Collaborative funding partnerships that targets consortiums rather than individuals should get preference.
- The digital policy aim should be to close the digital divide between communities, cities, districts, provinces and villages through digital infrastructure provision which promotes universal access to digital education. Government digital education policy should focus on universal access by all citizens of the country to enable them to enjoy the benefits of the digital economy.
- Establish infrastructure for ICT education and practicals in communities through Public- Private Partnerships. Such partnerships can take the form of Build-Operate-Transfer [BOT]Build-Operate-Own[BOO],Build-Own-Operate[BOO],Build-Own-Operate-Transfer[BOOT]. Memorandum of Understanding/Partnerships with ICT companies, ICT colleges, private companies and NGOs in the ICT industry should be established to facilitate knowledge acquisition on the digital infrastructure needed to establish a digital infrastructure and digital economy.

➢ *Role of Starlink in Breaking the Rural-Urban Infrastructure Digital Divide.*

Starlink's technology holds great potential to transform the education sector by ensuring that students and teachers in rural communities have access to the same digital tools and resources as those in urban settings. Moreover, its compatibility with existing service providers allows for an integrated approach to solving connectivity issues across all sectors.

Starlink's satellite technology provides high-speed internet to underserved and remote areas through a network of low-earth orbit satellites. These satellites orbit closer to Earth than traditional satellites, which allows for faster speeds, lower latency, and more reliable connections, even in areas that have traditionally been "off-grid" [Dandira,L 2024] .

For rural areas, where physical infrastructure like fiber-optic cables is expensive and impractical, Starlink offers immediate access to the internet without the need for extensive ground infrastructure. By focusing on satellite technology, Starlink can cover areas that have previously been ignored by conventional service providers. Starlink is good for education and business as it ensures connectivity even in the most remote areas to achieve streaming, video calls, online gaming, remote working, online learning and collaborative learning.

Starlink application requires an unobstructive view of the sky to ensure connectivity and this method allows the user to select the best location for installation especially in rural areas.

➢ *Impact on the Education Sector*

The educational sector in rural areas faces significant challenges due to limited access to high-speed internet, a prerequisite for modern learning environments. Starlink's connectivity can help mitigate these challenges in the following ways which must be addressed by digital education policy;

- Enabling Remote Learning: With the advent of e-learning platforms, rural students and teachers need reliable internet to access educational resources. Starlink can provide the bandwidth needed for online classes, educational video streaming and access to global digital libraries.
- Equalizing Opportunities: Starlink's wide reach allows students in rural communities to access the same quality of education as their urban counterparts thus reducing the digital divide and enhancing equal opportunities for academic success.
- Teacher Training and Development: Teachers in remote areas can engage in professional development programs and training through video conferencing and online courses. Starlink enables uninterrupted communication and collaboration between educators, regardless of their location.
- Integration with Existing Infrastructure: Starlink does not aim to replace existing service providers but rather complements them by reaching areas they cannot serve. In areas where some connectivity exists but is unreliable or insufficient, Starlink can offer a robust alternative or serve as a backup to ensure continuous connectivity.
- Live Coverage of Key Events: In a culturally rich environment, events such as community gatherings, funerals, and important social events are now increasingly covered live through the use of Starlink's internet services. This has become especially important in rural areas where communities often feel disconnected from each other. Starlink bridges this gap by providing an affordable and reliable platform for such communication.

➢ *Complementing Existing Service Providers*

In complementing existing service providers, Starlink's model of internet delivery can work alongside traditional mobile and fiber providers. By extending connectivity to areas where traditional service providers do not operate, Starlink can support other sectors like healthcare (telemedicine), local governance (e-government services), and agriculture (precision farming) through reliable internet. Starlink's technology holds great potential to transform the education sector by ensuring that students and teachers in rural communities have access to the same digital tools and resources as those in urban settings. Moreover, its compatibility with existing service providers allows for an integrated approach to solving connectivity issues across all sectors. Digital education policy should therefore programme starlink technology application to address the digital divide in both learning and business. The policy should specify how this cheap Starlink technology could be accessed by all schools and businesses especially those in rural areas to ensure that the digital divide between urban and rural areas is eliminated.

According to Elon Musk [2024], starlink is great as a back-up option in case of emergencies as it is able to connect in minutes and provide the required relief.

➢ *Digital infrastructure needed to develop digital skills*

The digital policy should address the following issues;

- Establish Broadband Internet Access; reliable, fast internet connectivity in schools and public spaces
- Providing teachers and students with personal computers, tablets and other digital devices for learning and employment/work. The budget should be funded by Treasury in support of the digital revolution transformation which drives the digital economy like what happened in Rwanda.
- Establishment of Learning Management Systems [LMS] platforms such as Google Classroom, Moodle, or Blackboard for content delivery, assignment submission and tracking progress.
- Establishment of Smart Classrooms; interactive whiteboards, projectors and video conferencing tools to support hybrid learning
- Establishment of cybersecurity infrastructure of tools to safeguard digital assets, students' data and ensure secure online interactions.
- To address limited digital infrastructure especially in rural areas, the government, in collaboration with private sector partners, should invest in expanding digital infrastructure, including high-speed affordable internet and solar-powered technology hubs in schools. Initiatives like low-cost device distribution programs can also help bridge the digital divide.

➢ *Training methods to be used by teachers/facilitators to impart digital skills*

The following methods are appropriate in developing digital skills and they must be specified in the digital education policy;

- Blended Learning; A mix of face-to-face instruction and online tools to ensure flexibility and access to resources
- Hands on practice; using real world applications and tools during training sessions to help students gain practical experience
- Peer Learning, through encouraging group work and peer-led tutorials especially for advanced learners to mentor beginners
- Gamified Learning which uses educational games or challenges [e.g. coding competitions, digital scavenger hunts] to keep learners engaged.
- Capacitate ICT Teachers from all the districts and provinces through weekend lectures, block lectures and holiday lectures.
- Develop private-public ICT partnership between industry and commerce players and schools authorities to deliver ICT education services and ensure the skills coming out of the school system are in line with the demands of the economy.
- Develop strategy for access to digital education gadgets for students from primary to tertiary level to achieve digital competencies at an early age. This could be done by offering digital gadgets like smart phones, laptops, tablets at concessionary rates by the government through tax breaks on such gadgets to promote digital transformation through originality, creativity and adaptation to online learning at an early age. Free laptop or free smart phone for teachers and students whose usage are controlled by the government would go a long way in promoting a digital education revolution in Zimbabwe. Treasury will need to consider this project in the national budget as a top priority for at least a 10 year period to ensure a rapid transition to a digital economy.
- Develop and implement comprehensive professional development programs focused on digital literacy and the use of educational technology in schools and at community level. This could include workshops, online courses, and ongoing support to ensure that teachers and community leaders are equipped to integrate digital tools into their teaching and business practices.

Continuous Professional Development [CPD] through regular workshops and training sessions for lecturers to stay updated on technological advancement is key to the digital education policy.

C. Curriculum Development Issues

- Revise education curriculum to incorporate digital skills and AI applications[curriculum integration]
- Revise the national curriculum to include a stronger emphasis on digital skills, coding, data literacy, and other competencies required for the 4th Industrial Revolution. Incorporating project-based learning and real-world problem-solving activities can also help students develop essential digital skills.
- The development of digital skills in the curriculum should promote science, technology, innovation and entrepreneurial skills development for sustainable development
- Curriculum development should be informed by industry-education linkages, the demands of the 21st century digital economy, bilateral and multilateral partnerships with other countries to meet the needs of citizens but more importantly to create employment through online jobs.

Development of digital skills in Zimbabwe's education curriculum should focus on the following skills at various levels;

➢ *Digital Skills Required at ECD and Primary Level*

- Basic computer literacy
- Understanding how to use computers, tablets, mobile phones and other devices for personal and school tasks. Access to a mobile phone or laptops in the classroom environment becomes key to the development of digital skills at ECD level.
- Introduction to basic coding languages like Scratch for younger students
- Finding school information and using information on the internet
- Teaching how to use the internet safely and responsibly

➢ *Digital Skills Required at Secondary School and Tertiary Level*

- Information literacy
- software programmes usage
- content creation
- computer literacy
- Data analytics; understand how to use data analysis software like Excel, SQL and Power BI
- Problem solving
- Search engine optimization
- Cybersecurity; understanding how to safeguard personal and organizational documents.
- Artificial intelligence
- Digital creativity; using digital tools for graphic design, video editing and multimedia production.
- Collaboration tools; using platforms like Google Classroom or Microsoft Teams for group work or virtual learning

➢ *Strategy for Mainstreaming the above Digital Skills in the Education Curriculum for the Development of Students*

- Embedding digital tools across all subjects to ensure continuous exposure [e.g. Maths, Science, Arts]
- Creating compulsory IT modules in the curriculum from primary to tertiary education level.
- Partnering with tech companies to provide hands-on digital skills experience for high school and tertiary students
- Offering globally recognized certification of IT courses as part of the school syllabus [eg Google IT Support, Microsoft Office Specialist]; these certificate courses will open employment opportunities for students whilst they are still learning. Students can do part-time work, weekend work, after hours work or online work to supplement their income during their studies.
- Regular up-skilling of teachers to keep up with new digital technologies and teaching methods
- The ability to participate in online courses, e-tutorials and webinars through mentorship at school or in communities by peer mentors.

In addition to the above skills, the existing curriculum should adequately incorporate digital skills or 21st-century competencies, such as *critical thinking*, *problem-solving*, and *creativity*, which are essential for success in the digital economy.

➢ *Digital Skills needed for Employment/Employability*

These are the digital skills which are needed to ensure employability and marketability in the digital economy and they include;

- Advanced IT proficiency in skills like working with cloud services [eg AWS ,Azure], cybersecurity knowledge, data management
- Digital marketing; using social media, SEO and online advertising tools.Digital marketing through social media online platforms like Facebook and Linkedin are effective in delivering positive results to world audiences.
- Software Development and Coding for roles in IT and programming knowledge [eg in Python, Java, HTML,SOL].Knowledge is useful in data analysis, digital communication with platforms like Zoom, Slack and project management tools like Asana or Jira.

✓ Cybersecurity
✓ Online productivity and collaboration
✓ Internet safety and privacy
✓ Using software programmes.
✓ Software programming
✓ Software engineering
✓ Computer programming
✓ Content development
✓ Digital project management
✓ website development and graphic design
✓ E-commerce
✓ Data science
✓ Cloud computing
✓ Artificial Intelligence and Machine Learning

Mastering the above skills which are critical to the digital economy will ensure employment opportunities in many sectors of the economy at national, regional and global levels. Employment opportunities arise from many online jobs which can be carried out from anyway in the world, at home, during weekends and through teleworking.

The digital education policy should therefore aim at realizing the objective of employment creation through the development of the above digital skills in the school system and in the community which are in line with the digital economy.

D. Insufficient Industry-Education Linkages

Where there is a disconnect between the education system and the needs of the digital economy, educational institutions should strengthen partnerships between educational institutions and the digital industry to ensure that curricula are aligned with the needs of the digital economy. The strategy could include collaborative projects on curriculum development, internships, and mentorship programs that provide students and lecturers/teachers with real-world experience and industry-relevant skills.

E. Lack of Coordination and Policy Support for Digital Education

Government of Zimbabwe should develop a national digital education strategy that outlines clear goals, guidelines, and benchmarks for integrating digital skills into the education system. This strategy should involve all stakeholders, including government agencies, educational institutions, and the private sector, to ensure a cohesive approach to digital education which is linked to the digital economy with the ultimate objective of achieving a digital skills ecosystem in Zimbabwe.

F. Ethical and Responsible Use of Technology

The digital education policy must address the ethical implications of living in an information society emphasizing the need for responsible use of digital technology and the need to balance digital engagement with human interaction which does not emphasize overreliance on technology.

G. Digital Education Policy Evaluation

The digital education policy should have standards of evaluating its success in meeting the demands of the 21st Century digital economy. It will focus on indicators such as;

- Universal acceptability and adaptability of digital skills in the education system and the economy
- Crafty competency and craft literacy in digital skills nationwide
- Improved digital infrastructure for both urban and rural areas

- Eliminating the rural-urban divide through efficient and effective internet connectivity for the education system and for business.
- Development of a national curriculum which is fully compliant with the demands of the 21st century digital economy
- Regular assessment and certifications based on digital skills acquisitions
- Tracking Employability Metrics by monitoring employment rates and feedback from employers on the digital skills of the graduates
- Developing Digital Skills Proficiency Tests through implementing standardized digital skills tests to measure competence at different stages
- Developing Students Performance Metrics where you monitor students' performance particularly in tech-related subjects.

VI. POLICY RECOMMENDATIONS

- In drafting the digital education policy, Government should not focus so much on control but developing a digital education ecosystem in Zimbabwe that leaves no one and no place behind as its top priority.. The right to education is a fundamental human right which is enshrined in section 75 of the Constitution of Zimbabwe Amendment (No.20), 2013) and any law, practice, custom or conduct inconsistent with this provision is invalid to the extent of the inconsistency with the constitution.
- The freedom of expression which is guarantee in section 61(a),(b) and (c) should be factored in the policy; that is
- freedom to seek, receive and communicate ideas and other information
- freedom of artistic expression and scientific research and creativity; and
- academic freedom.

This recommendation will promote seamless collaborations among institutions and students within the country and abroad in knowledge exchanges that advances digital skills acquisition, dissemination and digital economic transformation.

- The new digital education policy should facilitate, not hinder, investment in digital education infrastructure which is crucial for the development of a robust digital economy.
- Government should develop funding partnerships with local institutions and bilateral and multilateral partners to develop digital infrastructure projects for Zimbabwe since it cannot do it alone.
- Government should outline in the policy community standards for charts and participation in the education system for the benefit of all members of society.

VII. CONCLUSION

The development of a digital education policy establishes the required framework of addressing the demands of the 21st century digital economy by planning for the challenges and opportunities of the 4th Industrial Revolution. The involvement of Government is key to ensure there is fairness, equity and responsible use of the new technologies, through the digital education policy, to improve connectivity for learners and educators and for the overall development of the digital economy. The digital education policy should aim to create an environment where technology, community development and economic growth flourish in the digital era. The digital education policy should complement other policies that regulate and guide the use and adoption of disruptive technologies for national transformation and economic and social development. These policies should be in line with the constitution of Zimbabwe for them to be legally binding.

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