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Education in Central Africa's Cameroon, CAR and DRC in the Era of Virtual Learning: *What Leadership Process?*

Albert Mbiatem^a

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ABSTRACT

The advent of virtual learning has redefined the educational paradigm worldwide, significantly enabling learners to access education through digital technologies. However, the Central African region's transition to digital education has been particularly constrained by deep-rooted infrastructural and governance challenges, with internet access remaining markedly more limited than in other parts of the African continent. This paper examines the leadership processes required to implement and sustain effective virtual learning in selected Central African countries – namely Cameroon, Central African Republic, and Democratic Republic of Congo – where persistent challenges include limited internet access, unreliable electricity, inadequate digital infrastructure, and weak policy implementation. This study is exploratory: it represents a preliminary inquiry into an area where existing knowledge on Central African states is limited. Its primary objective is not to provide definitive answers, but to gain a deeper understanding of the central issues and variables at play. The study draws on Adaptive Leadership Theory that shifts the focus from the leader as the sole authority to leadership as a shared process whereby empowered individuals at all levels take ownership of change. Findings reveal that the persistent gaps between policy rhetoric and practical implementation in all three central African states are connected to the quality of policy and educational leadership. It requires not just technological solutions, but adaptive and context-sensitive leadership that empowers stakeholders at all levels to drive change and bridge the digital divide.

Keywords: Education; Era; Virtual Learning; Leadership; Central Africa

1. INTRODUCTION

The global surge toward virtual learning has fundamentally altered the educational landscape, enabling millions of learners to access knowledge beyond the confines of traditional classrooms. This shift has accelerated in response to crises such as the

COVID-19 pandemic, broadly recognised as the most significant disruption in the history of education in living memory, compelling governments and educational institutions to swiftly shift to remote and technology-driven learning solutions in order to maintain instructional continuity.¹ Yet, even in many

^aDr. Albert Mbiatem is an alumnus of the African Leadership Centre (ALC). He currently serves as Senior Lecturer in the Department of International Relations and Conflict

Resolution at the University of Buea and as Research Coordinator at ALC Nairobi.

well-resourced and technologically developed countries, e-learning and distance education have encountered significant pushback and limitations. Research shows students often struggle with motivation, time management, and social isolation in online environments, while instructors face increased workload, technical stress, and inadequate pedagogical support.² Beyond that, systematic reviews highlight broader structural issues such as digital inequities, insufficient policy frameworks, and lack of institutional readiness that undermine the quality and scalability of e-learning.³ It has largely been noted that, in emerging economies, particularly in Africa, asynchronous online education risks exacerbating inequality. Without widespread access to reliable internet, electricity, or devices, marginalized populations may be further excluded.⁴

While most regions across the African continent have made significant strides in embracing online learning, Central Africa continues to face uniquely deep-rooted challenges, ranging from inadequate infrastructure and limited digital literacy to equity issues and insufficient training for online teaching.⁵ Technology has opened up education to learners facing significant obstacles in access to schools or well-trained teachers.⁶ The virtual learning challenges in Central Africa significantly emanate from a very low electrification rate compared to other African regions. In 2021, only 31% of the

population in Central Africa had access to electricity. This is significantly lower than the rates in North Africa (98%), West Africa (56%), Southern Africa (53%), and East Africa (52%).⁷ The Central African states – Cameroon, the Central African Republic (CAR), and the Democratic Republic of Congo (DRC) – selected for this study confront deep infrastructural deficits and ineffective policy implementation that impede virtual learning.

Different World Bank assessments over the years present Cameroon, CAR, and DRC as facing largely convergent challenges in implementing virtual learning. These include a chronic deficiency in foundational infrastructure,⁸ such as reliable electricity and internet connectivity; a profound digital divide that exacerbates inequities in access to technology and data; a shortage of technical and pedagogical skills⁹ among both educators and students; and inadequately formulated e-learning policies.¹⁰ Furthermore, these systemic issues are frequently compounded by political instability, which disrupts educational continuity and infrastructure development.¹¹ The impediments to effective virtual learning are inextricably linked to failures in policy and educational leadership, which often fail to align with or address the stark realities of the local context. While the three countries confront convergent challenges in virtual learning, a deep analysis must also interrogate the

¹ World Bank Group (2023), Learning Recovery to Acceleration: A Global Update on Country Efforts to Improve Learning and Reduce Inequalities. World Bank Group, 29 July. Available at

<https://www.worldbank.org/en/topic/education/publication/the-rapid-framework-and-a-guide-for-learning-recovery-and-acceleration>. [Accessed 11 August 2025].

² Chang, Chiu-Lan and Fang, Ming (2020), E-Learning and Online Instructions of Higher Education during the 2019 Novel Coronavirus Diseases (COVID-19) Epidemic. *Journal of Physics Conference Series* 1574(1), pp. 1-6.

³ van der Merwe, Thomas Mc Donald, Serote, Mmafani. and Maloma, M., 2023. A Systematic Review of the Challenges of e-Learning Implementation in Sub-Saharan African Countries: 2016-2022, *The Electronic Journal of e-Learning*, 21(5), pp 413- 429.

⁴ Mhlanga, David (2025), Digital Transformation of Education, the Limitations and Prospects of Introducing the Fourth Industrial Revolution Asynchronous Online Learning in Emerging Markets. *Discover Education*, 3(32), pp. 1-18.

⁵ Distance Learning Institute (2024), Overcoming Barriers to Distance Education in Central Africa. 20 July. Available at <https://distancelearning.institute/growth-philosophy/overcoming-barriers-distance-education-central-africa>. [Accessed 11 August 2025].

⁶ UNESCO (2023), *Global Education Monitoring Report Summary 2023: Technology in education: A Tool on Whose Terms*. Paris, UNESCO.

⁷ Saifaddin, Galal (2024), Share of Population with Access to Electricity in Africa in 2021, by Region. Statista, 23 December. Available at

<https://www.statista.com/statistics/1475295/population-with-access-to-electricity-in-africa-by-region/>. [Accessed 11 August 2025].

⁸ Domínguez-Torres, Carolina and Foster, Vivien (2011), The Central African Republic's Infrastructure A Continental Perspective. June. World Bank, Policy Research Working Paper 5697.

<https://openknowledge.worldbank.org/entities/publication/8c805619-ce09-5b5c-bc45-23c69e253b14>. [Accessed 29 November 2025].

⁹ World Bank Group (2023), DRC Digital Skills Analysis: Completion Note. June.

<https://thedocs.worldbank.org/en/doc/d3291c08f4b645fdc31be4908947ef6b-0140022025/related/4DRC-TF0C1973-Completion-note-DRC-Digital-Skills-Analysis.pdf>. [Accessed 17 November 2025].

¹⁰ World Bank Group (2020), Cameroon Digital Economy Assessment Country Diagnostic. June. Available at: <https://documents1.worldbank.org/curated/en/099062824115035044/pdf/BOSIB-684b3d6e-527f-4a7a-a243-50e02b12bbdd.pdf>. [Accessed 17 November 2025].

¹¹ Distance Learning Institute (2024), p. 2.

nuances of local context, the roles of policy and school actors, and the presence of grassroots innovation.

The broader literature, such as Papagiannis and Pallaris,¹² Dwyer et al,¹³ and Sönmez,¹⁴ underscores the potential of technology to foster learners' critical thinking and problem-solving abilities, which are widely regarded as essential skills for success in the 21st century. Online educators can leverage tools like Google Docs, Blackboard discussion forums, and other interactive activities to foster the development of these essential skills.¹⁵ Like any other part of the developing world, sub-Saharan African countries perceive education for all as the major driver behind any form of fundamental change in society.¹⁶ The literature consistently notes that the outbreak of COVID-19 in 2020 triggered a rapid and widespread surge in e-learning across academic institutions in Sub-Saharan Africa.¹⁷ However, authors such as Molawa,¹⁸ and Oladokun and Aina,¹⁹ state that, when compared to other regions of the world, the digital divide in Africa is a major constraint, as access to technology remains a big challenge. In a similar perspective, Mbatia²⁰ and Azeez and vade Vyver,²¹ assert that although development is increasingly influenced by Information and Communication Technology (ICT), much of the African continent still lacks the necessary infrastructure and capacity to fully support its implementation. Kavulya and Misava meanwhile argue that e-learning efforts in Africa have encountered obstacles such as weak ICT

infrastructure, insufficient policy support, and a lack of adequate online learning skills within higher education institutions.²²

A significant gap in the existing literature, as highlighted above, is the insufficient attention given to the role of leadership processes at both policy and educational levels concerning virtual learning. This exploratory study contends that addressing infrastructural, technical, and policy-related challenges requires more than the provision of hardware and internet connectivity; it necessitates leadership that is adaptive, collaborative, and sensitive to local contexts. Grounded in Adaptive Leadership Theory, which emphasises the mobilisation of individuals and institutions to confront complex, systemic, and value-laden challenges, this study argues that sustainable virtual learning in Cameroon, CAR, and DRC relies not only on technological infrastructure, but also on contextually responsive leadership fostered through collective action. The study is guided by the following research questions: What are the main challenges faced by Central African states in adopting virtual learning? What role does policy leadership play in shaping access, equity, and quality in virtual education across these countries? And how have educational leaders in the selected Central African states responded to the shift toward virtual learning?

¹² Papagiannis, Petros and Pallaris, Georgios (2024), Evaluating 21st Century Skills Development through Makerspace Workshops in Computer Science Education. Computer and Society, Cornell University.

¹³ Dwyer, C., Hogan, M. J., & Stewart, I. 2014. "An Integrated Critical Thinking Framework for the 21st Century." *Thinking Skills and Creativity*, 12 (June): 43–52

¹⁴ Sönmez, Elif (2021), Technology-Enhanced CT: A Systematic Review, *Thinking Skills and Creativity* 41(5), pp.100913.

¹⁵ Mansbach, Jessica (2015), Using Technology to Develop Students' Critical Thinking Skills. 14 September. Available at <http://dl.sps.northwestern.edu/blog/2015/09/using-technology-to-develop-students-critical-thinking-skills/>. [Accessed 11 August 2025].

¹⁶ Onwe, Joseph (2014), Policies and Practices of Open and Distance Learning Models in the Sub-Saharan African Countries: A Literature Survey. *Journal of Teachers Perspective*, 8(2), pp. 1-23.

¹⁷ Adarkwah Michael (2021), An Outbreak of Online Learning in the COVID-19 Outbreak in Sub-Saharan Africa: Prospects and Challenges. *Global Journal of Computer Science and Technology* 21(2),1-10.

¹⁸ Molawa, Segametsi (2009), The "First" and "Third World" in Africa: Knowledge Access, Challenges and Current

Technological Innovations in Africa. First International Conference on African Digital Libraries and Archives. Addis Ababa, Ethiopia.

¹⁹ Oladokun, Olugbade and Aina Lenrie (2011), ODL and the Impact of Digital Divide on Information Access in Botswana. *International Review of Research in Open and Distance Learning*, 12(6), pp. 157–177.

²⁰ Mbatia, Paul (2008), Education and Information & Communication Technologies (ICT) in Africa: Using ICT to improve education in Sub-Saharan Africa. Available at <https://core.ac.uk/download/pdf/236171507.pdf>. [Accessed 11 August 2025].

²¹ Azeez, Nureni and van der Vyver, Charles (2018), Digital Education: Assessment of E-Learning and M-Learning Adoption in Tertiary Institutions in South Africa. Conference on e-Learning, e-Management and e-Services (IC3e). Langkawi Island, Malaysia. 21 – 22 November 2018, Langkawi Island: IEEE. 10.1109/IC3e.2018.8632654.

²² Kavulya, Joseph and Misava Edward (2014), Implementing E-learning and the Quest in Higher Education in Sub Saharan Africa: Conceptualizing the Prospects and Challenges. Available at

https://www.researchgate.net/publication/361964503_Implementing_Elearning_and_the_Quest_for_Quality_in_Higher_Education_in_subSaharan_Africa_Conceptualizing_the_Prospects_and_Challenges. [Accessed 11 August 2025].

This paper is structured into six sections to examine the interplay of virtual learning and leadership processes in Cameroon, CAR, and DRC. The first section, serving as the introduction, has contextualized the study by outlining the region's profound infrastructural and policy challenges and reviewing the relevant literature. The second section delineates the methodological approach and theoretical framework. The core analytical sections, spanning sections three to five, sequentially detail the crippling impediments of digital and electrical infrastructure, critique the systemic failures in policy leadership and implementation, and explore the role of school-level and adaptive leadership in cultivating resilience. In direct response to the central research question, the study in the last section concludes that the requisite leadership process is not a top-down, technical directive, but a decentralized and collaborative form of adaptive leadership. This central finding contends that sustainable virtual learning in these fragile states is contingent upon empowering stakeholders at all levels to collectively diagnose challenges, pioneer context-sensitive solutions, and assume ownership for bridging the gap between policy ambition and practical execution.

2. METHODOLOGY AND THEORETICAL FRAMEWORK

This exploratory study employs a multiple case study design to comprehend the leadership processes shaping virtual learning in Cameroon, CAR, and DRC. These countries were selected due to their shared regional challenges and socio-political complexities. A qualitative approach using thematic analysis was applied to examine data from scholarly and institutional sources. To interpret leadership responses, the study draws on Adaptive Leadership Theory, which emphasizes systemic adaptation in uncertain and complex environments. This framework is especially relevant to understanding educational leadership amid digital transitions in fragile contexts.

Methodology

This study adopts a multiple case study design that investigates the virtual learning situation in Cameroon, CAR, and DRC. These Central African states were selected for this study based on a confluence of factors: their strategic geopolitical importance, their experiences with protracted socio-political instability, and their shared, yet nuanced, challenges within the educational and technological sectors. This is particularly evident in the domain of virtual learning, where failures in policy

and educational leadership are acutely visible. The methodological rationale for this cross-case analysis is its capacity to illuminate both overarching regional patterns and distinct national particularities, thereby yielding a more nuanced and comprehensive analysis of the leadership processes that underpin or undermine virtual education initiatives across the Central African context. This tripartite selection is not arbitrary but is designed to facilitate a nuanced analysis that balances the identification of regional patterns with the critical investigation of contextual specificities. While the three states share a convergence of profound, systemic barriers, exemplified by the region's lowest continental electrification rate of 31%²³ and cripple the very foundation of digital education, they also represent a spectrum of political and institutional contexts. Cameroon, CAR, and DRC collectively embody the core infrastructural and policy implementation deficits that define the Central African challenge, allowing the study to first establish a regional baseline. This approach is methodologically suitable for an exploratory study, as it enables researchers to determine whether obstacles such as limited internet access, inadequate digital skills, and weak policy are universal across the region or are mediated by distinct national circumstances.

Furthermore, the choice of these three countries allows for a rigorous examination of the study's central theoretical framework: Adaptive Leadership Theory. By including states with varying degrees of political stability and governance capacity, from Cameroon's large-scale governance challenges to the protracted instability in CAR and the fragile stability in the DRC, the research investigates how leadership processes manifest differently across diverse crisis environments. This cross-case study design is essential for moving beyond a generic diagnosis of problems to generate initial insights into how adaptive, context-sensitive leadership can be cultivated. It directly addresses the research questions by enabling a cross-case analysis of how policy leadership fails or succeeds in different settings and how educational leaders on the ground respond to shared and unique adversities. Consequently, this selection provides fertile ground for achieving the study's exploratory objective: to develop a more textured understanding of the variables at play and to generate preliminary propositions about the role of leadership in bridging the significant gap between policy rhetoric and practical implementation in virtual learning across Central Africa.

Cameroon, located at the crossroads of West and Central Africa, is a bilingual country (French and English) with

²³ Saifaddin, Galal (2024), p. 1.

a relatively diverse and complex education system.²⁴ It has made some progress in digital education, especially in urban centers like Yaoundé and Douala, but it still faces significant disparities between rural and urban areas. The armed conflict in the Anglophone regions and the Boko Haram terrorism in the Far North region have further exposed the fragility of educational leadership and infrastructure. CAR, on the other hand, represents one of the most fragile states in the region. With a long history of political instability and conflict, the education system in CAR has struggled to maintain basic functionality.²⁵ Internet penetration is low, digital infrastructure is underdeveloped, and virtual learning remains limited. The DRC, one of the largest and most populous countries in Africa, presents a diverse educational landscape with significant regional inequalities exacerbated by recurrent socio-political instabilities.²⁶ While major cities like Kinshasa and Lubumbashi have begun experimenting with virtual learning platforms, vast rural areas remain digitally excluded.

The study utilised secondary data to explore the leadership processes shaping the evolution of education in Central Africa during the era of virtual learning. Given the study's focus on understanding systemic trends, policy responses, and leadership dynamics within a complex socio-political and technological context, a qualitative approach is well-suited to provide depth, context, and interpretive insight. Data were gathered from peer-reviewed journal articles, books, institutional reports, policy documents, and credible international databases such as those of UNESCO, UNICEF, the World Bank, and various regional education observatories. These sources were selected to provide a comprehensive and multi-perspective understanding of how leadership has responded to the digital shift in Central Africa, particularly in light of infrastructural limitations, governance gaps, political instability, and socio-economic disparities. However, this study acknowledges a methodological constraint arising from the limited peer-reviewed literature on leadership and virtual learning in Central African states.

Consequently, the analysis was guided by a substantial body of policy documents and institutional reports, which were used to supplement the relevant academic journals and research texts. This limitation further justifies the need for this study to address the existing literature gaps on the topic in Central Africa.

A thematic analysis framework was employed to organise and interpret the data. This involved a systematic review of the selected documents to identify recurring themes related to leadership strategies, digital education policy implementation, access and equity in virtual learning, and institutional capacity within Cameroon, CAR and DRC. Key themes were coded inductively, allowing insights to emerge from the data while remaining attentive to context-specific peculiarities across national settings. The study also critically engaged with literature that examines broader African digital education strategies and challenges in order to situate the Central African experience within a continental framework. Ethical considerations were addressed by ensuring that all secondary data used in the study came from publicly available and properly cited sources.

Theoretical Framework: Adaptive Leadership Theory

This study is grounded in the principles of Adaptive Leadership Theory, a framework initially developed by Heifetz,²⁷ and subsequently by Heifetz and Linsky²⁸ and Heifetz et al.²⁹ This theory offers a compelling lens through which the study examines the leadership processes influencing education in the three selected Central African countries amid the shift to virtual learning. Adaptive leadership is particularly relevant in complex and uncertain environments where traditional solutions are insufficient, and where leaders must guide their systems through transformation by mobilising people, fostering innovation, and navigating systemic resistance.

In the context of Central Africa, particularly in Cameroon, CAR and DRC, the transition to digital

²⁴ The World Factbook (2025), Cameroon People and Society. Available at <https://www.cia.gov/the-world-factbook/countries/cameroon/#people-and-society>. [Accessed 28 August 2025].

²⁵ Smith, David (2013), Unspeakable Horrors in a Country on the Verge of Genocide, The Guardian, 22 November. Available at <https://www.theguardian.com/world/2013/nov/22/central-african-republic-verge-of-genocide>. [Accessed 28 August 2025].

²⁶ Autesserre, Séverine and Gbowee, Leymah (2021), *The Frontlines of Peace: An Insider's Guide to Changing the World* (1st ed.). (Oxford University Press).

²⁷ Heifetz, Ronald (1994), *Leadership without Easy Answers*. (Harvard University Press).

²⁸ Heifetz, Ronald and Linsky, Marty (2002), *Leadership on the Line: Staying Alive through the Dangers of Leading*. (Harvard Business Review Press).

²⁹ Heifetz Ronald, Grashow Alexander and Linsky, Marty (2009), *The Practice of Adaptive Leadership: Tools and Tactics for Changing your Organization and the World*. (Harvard Business Press).

education has been neither linear nor uniformly successful. It has occurred within a region marked by chronic infrastructural deficits, fragile governance structures, limited digital access, and uneven policy implementation. These conditions present what Heifetz describes as adaptive challenges, which are issues that cannot be solved with authoritative expertise or routine procedures alone, but instead require systemic learning, experimentation, and shared responsibility across stakeholders.³⁰ Leaders in ministries of education, regional bodies, and even local school administrators must exercise what the theory terms “holding the space”, a process of managing uncertainty and allowing discomfort to surface as part of meaningful progress. Rather than asserting control, adaptive leaders encourage innovation from within, promote collaboration across sectors, and empower actors at all levels of the system to take ownership of change. This is particularly essential in virtual learning environments, where successful implementation depends not only on top-down directives but also on bottom-up engagement – from teachers, parents, students, and technology partners.

While the adaptive leadership framework is widely praised for shifting attention from technical fixes to deeper systemic transformation, some scholars argue that it can be overly normative and insufficiently attentive to political constraints, institutional decay, and coercive governance structures.³¹ These are typical of fragile states.³² Applying the theory to Cameroon, CAR, and the DRC reveals a critical tension: the absence of adaptive leadership processes is not simply a leadership shortcoming, but a reflection of structural contexts in which political elites actively suppress the very conditions that the theory presupposes, such as open deliberation, distributed agency, and adaptive work. In such environments, adaptive leadership risks “proving the obvious,” identifying adaptive deficits without fully explaining why adaptive mobilisation fails to emerge.³³ This limitation suggests that the theory must be adapted to account for settings where authority is predatory rather than developmental, and where crises reinforce entrenched power instead of catalysing adaptive change.

Despite its critiques, Adaptive Leadership Theory remains well-suited to analysing how leadership in Cameroon, CAR, and DRC navigate complex educational landscapes, whether by managing digital

transitions or by actively enabling broader systemic adaptation. The framework provides a structured approach to understanding leadership not as a position of authority, but as a dynamic process of mobilizing people and institutions to thrive under challenging and evolving conditions.

3. CORE CHALLENGES OF VIRTUAL LEARNING IN CAMEROON, CAR AND DRC

The transition to virtual learning in Cameroon, CAR, and DRC, has revealed deep systemic and structural barriers that hinder equitable and effective access to digital education. While global momentum toward online and hybrid education models accelerated during the COVID-19 pandemic, these three states have struggled to match policy ambition with implementation capacity. This section explores the core challenges that continue to undermine virtual learning in the three states. It focuses on three interrelated and critical areas: inadequate digital infrastructure, unreliable electricity supply, limited internet access, and ineffective policy implementation. By examining these issues, the section highlights not only the technological and institutional weaknesses present in each country but also the broader governance and equity concerns that must be addressed for sustainable digital education systems to emerge.

Inadequate Digital Infrastructure

With reference to the findings below, Cameroon, CAR, and the DRC face challenges related to inadequate digital infrastructure, but the severity and nature of these challenges vary. While all three countries struggle with digital connectivity, Cameroon is more infrastructurally equipped but underutilised, CAR is gradually emerging from near-total digital isolation, and the DRC faces profound foundational deficits.

In Cameroon, despite the aspiration to become a digital hub in Central Africa and access multiple submarine fiber-optic cables that include SAT-3/WASC (South Atlantic Telecommunications Cable No. 3/West Africa Cable System), WACS (West Africa Cable System), NCSCS (Nigeria-Cameroon Submarine Cable System), and SAIL (South Atlantic Inter Link), the country

³⁰ Heifetz (1994), p. 2.

³¹ Northouse, Peter (2021), *Leadership: Theory and Practice* (9th ed.). Sage.

³² Uhl-Bien, Mary and Arena, Michael (2018), *Leadership for Organizational Adaptability: A Theoretical Synthesis and*

Integrative Framework. The Leadership Quarterly, 29(1), pp. 89–104.

³³ Grint, Keith (2010), *The Sacred in Leadership: Separation, Sacrifice and Silence. Organization Studies*, 31(1), pp. 89–107.

continues to struggle with digital infrastructure that remains significantly underutilised.³⁴ The utilization rates of Cameroon's submarine cables are as follows: SAIL at 6%, SAT-3 at 29%, WACS at 57%, and NCSCS at 92%.³⁵ The International Telecommunication Union reports that only around 30 mobile broadband subscriptions exist per 100 inhabitants, far below the African average of 52 and starkly behind the global average of 95.³⁶ Although fixed broadband penetration is relatively high, the overall adoption of digital services remains low, primarily due to the so-called "fiber gap," where large segments of the population are either unconnected or unable to benefit from the existing high-capacity fiber-optic infrastructure. This gap, referring to areas where fiber-optic connectivity is either unavailable or unused, affected about 14 million people in 2020.³⁷ The disparity between infrastructural potential and actual utilisation speaks to barriers, including cost of transit/termination, regulatory constraints, monopoly issues, digital literacy, rural access, unreliable or insufficient complementary infrastructure (like power), and demand-side factors.

In CAR, digital infrastructure has historically been limited. As of 2021, only about 20% of the population had access to mobile services, a figure markedly lower than the continental average of approximately 80%.³⁸ While progress is being made, such as the launch of a 900-kilometre fiber-optic cable extension into the Central African Republic in 2023, funded by the African Development Bank and the European Union, many

regions of the country continue to face isolation and limited digital capacity.³⁹ Although the assistance through the Central African Backbone (CAB) project and the establishment of digital training centres reflect increasing progress, the persistent infrastructure gap still hinders broad access to digital connectivity.⁴⁰ The situation underscores CAR's long-standing digital deficit, characterized by historically low mobile penetration. Recent capacity-building initiatives and major infrastructure projects are now alleviating this near-total digital isolation. Despite this progress, a profound infrastructure gap persists, which continues to serve as a formidable barrier to comprehensive digital inclusion, especially for rural populations.

In the DRC, profound infrastructural challenges are evidenced by a low internet penetration rate of only 27%.⁴¹ Landline connections are nearly nonexistent, and broadband infrastructure is severely underdeveloped: only a handful of Intrusion Prevention Systems (ISPs) rely on fiber connectivity, with most depending on satellite links.⁴² The situation in the DRC, as described above, reflects the study by Lund and Cruz that interrogates the gap divide in Africa.⁴³ The critical issue in DRC thus lies in the discrepancy: Access versus affordability; urban versus rural; institutional versus household. Inadequate infrastructure, characterised by frequent power shortages, coupled with a burdensome regulatory environment of high taxes and complex rules, has stifled the growth of the country's internet, leaving it lagging behind regional counterparts.⁴⁴ For a

³⁴ Digital Watch Observatory (2025), Cameroon Digital Profile. Available at: <https://dig.watch/countries/cameroon>. [Accessed 29 August 2025].

³⁵ Ecofin Agency (2025), Camtel's Underused Submarine Cables Reach Only 16% Capacity. Available at: <https://www.ecofinagency.com/news-digital/2808-48230-camtel-s-underused-submarine-cables-reach-only-16-capacity>. [Accessed 30 August 2025].

³⁶ Mbodiam, Brice (2025), Strong Infrastructure, Weak Adoption: Cameroon's Mobile Broadband Trails African Average, 13 June, Business in Cameroon. Available at: <https://www.businessincameroon.com/public-management/1306-14748-strong-infrastructure-weak-adoption-cameroon-s-mobile-broadband-trails-african-average>. [Accessed 30 August 2025].

³⁷ Mbodiam (2025), p. 1.

³⁸ MexicoHistorico.com (2022), The Impact of Technology on Development in the Central African Republic. Available at: <https://www.mexicohistorico.com/paginas/the-impact-of-technology-on-development-in-the-central-african-republic-4764657c.html>. [Accessed 30 August 2025].

³⁹ African Development Bank Group (2024), Central African Republic: New Digital Era Dawns with Debut of High-Speed

Internet Cable, 11 September. Available at: <https://www.afdb.org/en/success-stories/central-african-republic-new-digital-era-dawns-debut-high-speed-internet-cable-74043>. [Accessed 30 August 2025].

⁴⁰ DPI Info Hub (2025), Connecting the Unconnected: The State of Internet Access in the Central African Republic, 29 May. Available at: <https://dpi.africa/connecting-the-unconnected-the-state-of-internet-access-in-the-central-african-republic>. [Accessed 30 August 2025].

⁴¹ Digital Watch (2024), Congo Kinshasa, Available at: <https://dig.watch/countries/congo-kinshasa>. [Accessed 30 August 2025].

⁴² Gjerstad, Lina (2007), Congo, Democratic Republic of (DRC). Global Information Society Watch. Available at: https://www.giswatch.org/en/country-report/civil-society-participation/congo-democratic-republic-drc?utm_source=chatgpt.com. [Accessed 30 August 2025].

⁴³ Lund, Susan and Cruz, Marcio (2025), Bridging the Digital Divide in Africa: Enhancing Technology Adoption for Economic Growth, 29 April. Brookings.

⁴⁴ Yeboua Kouassi (2023), Development pathways for the DRC to 2050. 7 June, Special Report, ISS.

full picture of connectivity in the DRC, it is not just as a weak end-state but as a landscape of emerging investment and infrastructural evolution, with large gaps still to bridge to ensure digital inclusion works beyond major urban centres.

Unreliable Electricity Supply and Limited Internet Access

Unreliable electricity supply and limited internet access are closely linked, especially in low-income and underdeveloped regions such as Central Africa. Without consistent power, digital infrastructure such as mobile towers, routers, and servers cannot operate efficiently. Users are often unable to charge devices or maintain stable connections, making internet access irregular or completely inaccessible.⁴⁵ Poor electrification directly undermines efforts to expand digital connectivity and access to online services. Without stable and affordable electricity, efforts to expand internet access, especially in the era of virtual learning, remain severely constrained in Cameroon, CAR, and DRC.

In Cameroon, an estimated 63.7% of communities lacked any access to electricity.⁴⁶ This unreliable and uneven power supply undermines digital connectivity: users frequently report that unstable electricity contributes to consistently poor internet access and performance. A study on internet connectivity in Cameroon identified the poor quality and reliability of electrical power as a major impediment to stable internet access. In some regions, electricity is available for only a few hours each day, severely limiting the ability to engage in online learning, remote work, and other bandwidth-intensive activities.⁴⁷ The ambition to expand virtual learning and digital services is fundamentally constrained by unreliable electricity access, particularly in rural and

underserved communities. The figure that 63.7%⁴⁸ of communities lack access to electricity is alarming, revealing a systemic infrastructure gap that critically undermines not only national digital inclusion goals but also the feasibility of sustainable virtual education.

In CAR, the national power provider, Enerca, runs two hydropower stations and a diesel plant located in Bangui. However, due to mismanagement, outdated infrastructure, and weak revenue collection, only about 60% of the Capital's (Bangui) residents, and just 4% of the population nationwide, rely on its services.⁴⁹ The reliability of internet and mobile connectivity is directly undermined by persistent electricity shortages, especially in regions outside the capital. Where grid power is absent or unaffordable, users are often forced to depend on expensive and unreliable generators to charge their devices. This added barrier significantly discourages the consistent use of mobile internet services.⁵⁰ The chronic energy insecurity in the country continues to obstruct the effective implementation of virtual learning, particularly beyond the capital, Bangui. The reliance on only two hydropower stations and a single diesel plant, all managed by the state utility Enerca, underscores a fragile and centralised energy system that is neither modern nor inclusive.

In the DRC, only around 15% of the population has access to electricity, and much of the electricity system relies on poorly maintained hydropower assets.⁵¹ This precarious energy environment directly limits internet access: the high cost of satellite or mobile internet, unreliable power for modems and routers, and frequent broadband service disruptions all combine to make digital connectivity a challenge even where telecom infrastructure exists.⁵² This precarious energy environment represents a huge barrier to virtual learning, highlighting the deep interdependence

⁴⁵ GSMA (2014), *Tower Power Africa: Energy Challenges and Opportunities*, 26 November. Available at: <https://leadershipandsocieties.com/index.php/lds/article/view/169>. [Accessed 11 September 2025].

⁴⁶ Mbodiam, Brice (2021), *Cameroon: 63.7% of Local Communities Still Have No Access to Electricity Due to Lack of Funding*, the MINEE Says, 5 July. Available at: <https://www.businessincameroon.com/energy/0507-11750-cameroon-63-7-of-local-communities-still-have-no-access-to-electricity-due-to-lack-of-funding-the-minee-says>. [Accessed 30 August 2025].

⁴⁷ Jean Fendji Jean louis, Esenler Alexandra, Schwartz-Henderson Laura, Charlie Martial Ngounou (2014), *Study on Internet Connectivity in Cameroon : Performance Analysis, User perception, Challenges, and Recommendations*. Available at: file:///C:/Users/Hp%20Revolve%20810%20G3/Downloads/Study_on_Internet_Connectivity_in_Cameroon_2021.pdf. [Accessed 11 September 2025].

⁴⁸ Mbodiam (2021), p. 1.

⁴⁹ World Bank Group (2022). *Central African Republic: Increasing Electricity Supply and Access and Supporting the Health System*. 3 June. Available at: <https://www.worldbank.org/en/news/press-release/2022/06/03/afw-central-african-republic-increasing-electricity-supply-and-access-and-supporting-the-health-system>. [Accessed 30 August 2025].

⁵⁰ Dalemet, Bievenu (2022), *CAR, Media Landscapes*. Available at: <https://medialandscapes.org/country/central-african-republic>. [Accessed 30 August 2025].

⁵¹ Bouchard, Justine (2025), *Electrification in DRC through Microgrids*, 28 January. Available at: <https://aaefrica.org/d-r-congo/electrification-in-drc-through-microgrids>. [Accessed 30 August 2025].

⁵² WIRED (1999), *In Congo, the Net Precedes Phone*, 25 January. Available at: <https://www.wired.com/1999/01/in-congo-the-net-precedes-phone/>. [Accessed 30 August 2025].

between electricity access and digital education. With only about 15% of the population having access to electricity, the country's potential to implement equitable, scalable virtual learning remains severely constrained.

Ineffective Policy Implementation

Across Cameroon, CAR, and the DRC, educational policies relating to virtual learning are in many cases, well-intentioned and formally adopted, but their implementation is often ineffective due to weak leadership, under-resourced institutions, and the inability to translate policy into practice. The gap between policy and implementation undermines virtual learning initiatives, making digital education less equitable and less reliable. The three Central African states, particularly during and post-COVID-19, adopted educational policies to facilitate virtual learning at various levels. In Cameroon, the three ministries responsible for primary, secondary, and higher education have each developed virtual learning policies, primarily guided by the Distance Education Centre⁵³ and Open and Distance Learning Policy Development for Higher Education.⁵⁴ In CAR, Virtual Learning Policy⁵⁵ has been introduced with support from UNESCO, while in the DRC, a National Strategy for the Organisation of Distance Learning,⁵⁶ has also been established, likewise backed by UNESCO. However, the concern is that, despite the existence of all these policies, virtual learning in these countries remains poorly implemented, largely due to ineffective leadership.

In Cameroon, research into the Ministry of Secondary Education indicates that technology policies for digital

skills are undercut by poor design and major implementation failures. The findings demonstrate a clear disconnect between policy and practice: most schools lack the essential teacher training, equipment, pedagogical frameworks, and administrative oversight required to achieve the stated objectives.⁵⁷ During COVID-19, Cameroon's government adopted a national response plan for continuity of education, including distance education, radio and television broadcasting, and online platforms among others. However, many schools and regions were unable to implement virtual learning effectively because of lack of infrastructure (internet, devices, electricity), insufficient teacher preparation, and weak institutional capacity.⁵⁸ A stark example of the inefficiency of online education occurred during a lockdown imposed by separatist fighters in Cameroon's two Anglophone regions. From September 8, 2025, schools were forced to close, yet the relevant ministries adopted no form of virtual learning, leaving students without access to education for over four weeks.

In CAR, the implementation of virtual learning is severely hampered by leadership gaps, limited institutional capacity, and inadequate infrastructure. Research shows that during school closures, many students are entirely cut off from formal education. Although temporary measures like radio programs are occasionally introduced, they are typically inconsistent, short-term, and lack the structure and effectiveness of a formal virtual learning system. UNICEF reports, for example, highlight that "alternative learning solutions, such as education by radio," are employed when schools cannot reopen, but these initiatives often cease once the immediate crisis subsides.⁵⁹ Moreover, teacher

⁵³ MINESEC (2022), Modernisation of Secondary Education, 11 October. Available at:

<https://www.minesec.gov.cm/web/index.php/en/infos/457-modernisation-of-secondary-education-2>. [Accessed 13 September 2025].

⁵⁴ Commonwealth of Learning (2024), Cameroon: COL Supports National ODL Policy Development for Higher Education, 21 October. Available at:

<https://www.col.org/news/cameroon-col-supports-national-odl-policy-development-for-higher-education>. [Accessed 13 September 2025].

⁵⁵ UNESCO (2024), Central African Republic (CAR): Education Country Brief, 24 January. Available at:

<https://www.iicba.unesco.org/en/central-african-republic-car>. [Accessed 13 September 2025].

⁵⁶ UNESCO (2025), Effectivité de l'enseignement ouvert et à distance en RDC, 29 May. Available at :

[https://www.unesco.org/fr/articles/effectivite-de-](https://www.unesco.org/fr/articles/effectivite-de-l-enseignement-ouvert-et-a-distance-en-rdc)

<l-enseignement-ouvert-et-a-distance-en-rdc>. [Accessed 13 September 2025].

⁵⁷ Engozo'o Yvan Rony, Fozing Innocent and Mutia Roselyn (2023), "Critical Issues in Developing Skills for the Digital Economy: The State of Policy in the Ministry of Secondary Education in Cameroon, *American Journal of Educational Research*, 11(6), 372-380.

⁵⁸ UNESCO (2024), Embracing Distance Education in Cameroon: Ensuring Continuity during COVID-19 Crisis, Available at: <https://www.unesco.org/en/early-childhood-education/embracing-distance-education-cameroon-ensuring-continuity-during-covid-19-crisis>. [Accessed 13 September 2025].

⁵⁹ UNICEF (2021), Central African Republic: New Wave of Violence Puts Education on Hold for One in Two Children Across the Country: Joint statement by UN Humanitarian Coordinator Denise Brown and UNICEF Representative Fran

preparation remains a critical weak point. Many educators in the Central African Republic lack training in digital pedagogy and virtual instruction. As a result, even when policies or infrastructure are nominally in place, teachers are often ill-equipped to design, deliver, or manage online or distance learning effectively. This gap renders virtual education fragmented and inconsistent, heavily dependent on external partners, variable in quality, and largely inaccessible to marginalized or rural learners.⁶⁰

In the DRC, infrastructural problems originating from ineffective leadership are equally rampant. In Bukavu (South Kivu), for instance, many higher education institutions found themselves underequipped for e-learning during the COVID-19 crisis. Though policies or plans may exist, institutions lack both ICT tools and trained staff, making transitions to online or blended learning difficult, if not impossible.⁶¹ Moreover, corruption and weak leadership in resource allocation mean that even when funds or plans are in place, execution remains ineffective. Poor governance, limited monitoring and evaluation capacity, vast geographic distances, and infrastructural challenges further hinder the implementation of educational technology policies.⁶² This reveals how leadership failures intersect with logistical and infrastructural obstacles to undermine educational technology efforts.

4. THE POLICY LEADERSHIP AND VIRTUAL EDUCATION IN CAMEROON, CAR, AND DRC

The degree to which policy leadership is effective correlates strongly with how well leaders address structural deficits (infrastructure, human capacity, governance), mobilize stakeholders, create accountability, and ensure policy coherence across levels – ministries, delegations, and schools. The integration of virtual education in Cameroon, CAR, and

DRC represents a profound adaptive challenge, far exceeding a mere technical problem of distributing digital devices. It is a critical test of policy leadership, demanding a sophisticated process that acknowledges the stark infrastructural, socioeconomic, and political realities of these contexts where policy implementation and monitoring have faced acute constraints. A critical examination of the required leadership processes, alongside implementation and monitoring frameworks, reveals a significant gap between policy ambition and feasible execution, threatening to exacerbate existing educational inequalities.⁶³

The following two sub-sections provide a critical examination of the systemic leadership and implementation failures that underpin the crisis of virtual education in the three countries. The first sub-section of this section argues that the requisite leadership is not a matter of top-down directive but a polycentric process of collaborative mobilisation; it then analyses the profound deficits in this process, from a lack of coherent strategy and equitable resource allocation to a fundamental disconnect between ambitious policies and the stark infrastructural realities on the ground. The second sub-section examines how these leadership failures manifest in execution, critiquing the prevalent top-down, technocratic implementation models that are ill-suited to local contexts and highlighting the critical collapse of monitoring and evaluation systems, which measure inputs rather than outcomes and create a damaging vacuum of accountability and adaptive learning. Together, these sections demonstrate that the inability to provide sustainable virtual learning is not merely a technical or resource issue but a governance failure, where leadership processes are misaligned with contextual realities and implementation is divorced from meaningful impact.

Assessing Leadership Process for Virtual Education in the Three States

Equiza, 23 February. Available at:

<https://www.unicef.org/press-releases/central-african-republic-new-wave-violence-puts-education-hold-one-two-children>. [Accessed 14 September 2025].

⁶⁰ Generis Global (2024), Overview of the Education System in Central African Republic, 10 November. Available at: <https://generisonline.com/overview-of-the-education-system-in-central-african-republic>. [Accessed 14 September 2025].

⁶¹ Murhi Isidore, Salama Diana and Kahasha Dieudonne (2023), COVID-19 has Turned Things Upside Down: E-

Learning in Bukavu City in the Democratic Republic of the Congo, *British Journal of Research*, 10(3), pp. 54-60

⁶² Chemonics International (2025), Transforming Education Systems in the Democratic Republic of the Congo Strengthening Education in DRC through Systems, Support, and Innovation. Available at: <https://www.chemonics.com/case-study/transforming-education-systems-in-the-democratic-republic-of-the-congo>. [Accessed 13 September 2025].

⁶³ UNESCO (2023), Global Education Monitoring Report: Technology in education – A tool on whose terms? Paris: UNESCO.

Leadership process here refers to how leaders (in government, ministry of education, local/regional authorities, institutions) generate policy, coordinate stakeholders, set strategic priorities, build legitimacy, allocate resources, and nurture capacity for change. For virtual education, this leadership process must go beyond drafting policy to managing the transformation (technology, pedagogy, equity). The leadership process required is not one of authoritative directive but of collaborative mobilisation.⁶⁴ According to Olonisakin, process-based leadership is a collective and situational process that unfolds across multiple societal domains and levels, involving both leaders and followers in a reciprocal exchange of influence.⁶⁵ This process-based leadership in Cameroon, CAR, and DRC has been ineffective, given that the virtual learning challenges discussed earlier in this study are largely attributable to leadership deficits within the educational systems of the three Central African states.

Across the three countries, a significant deficit in strategic planning and coherent policy leadership is evident. Governments and ministries of education frequently lack clear, comprehensive frameworks for virtual and distance learning. Where such policies do exist, they are often poorly implemented or inadequately institutionalized, resulting in a fragmented and unsustainable approach to digital education. For instance, in Cameroon, despite the adoption of certain digital platforms during the COVID-19 pandemic, no fully codified national policy for online distance education has been established across the three ministries of education. Consequently, initiatives tend to emerge on an ad-hoc basis, lacking long-term vision, coordinated oversight, and the institutional support necessary for meaningful impact.⁶⁶ The lack of coordination among various levels of leadership (national, regional, and school) also compounds the problem because roles, responsibilities, and resources are ambiguous or unevenly distributed. Despite the Sectoral Strategy Document for Education and Training, 2030 Horizon (DSSEF 2030),⁶⁷ which mandates a broad leadership commitment to education, virtual learning remains critically under-resourced in this Central African state.

In the three states, leaders are often unable to secure or allocate adequate resources (financial, infrastructural, and human) for virtual learning. In Cameroon, for instance, many homes have phones but lack computers or tablets; data costs are high relative to incomes; there are also frequent energy/electricity issues.⁶⁸ Similarly, in CAR and DRC, institutions suffer from a lack of ICT equipment and stable infrastructure, which leadership often cannot remedy quickly enough.⁶⁹ Furthermore, leadership has frequently failed to proactively address how learners in rural, low-income, or conflict-affected areas will access essential resources such as devices, reliable electricity, and internet connectivity. As earlier mentioned, digital content and platforms often disproportionately benefit urban, more affluent students, while those in rural areas, where electricity and internet access are notably unstable or absent, remain significantly disadvantaged.

The most visible leadership process deficit in the three states is the chasm between ambitious national digital education policies and their practical execution, a disconnect well-documented by international organizations. Governments have announced strategies aligned with global trends, such as the DRC's *Stratégie nationale de l'enseignement à distance* (translated in English as Distant National Strategy of Teaching) or Cameroon's purported efforts to integrate ICT in education. However, these policies are formulated in a vacuum, devoid of the context-specific diagnostics that adaptive leadership requires. The International Telecommunication Union (ITU, 2023) consistently ranks these nations at the very bottom of global ICT Development Indexes, citing prohibitively expensive internet access, negligible rural broadband penetration, and unreliable electricity.⁷⁰ A competent leadership process would first treat these infrastructural realities as the primary constraint to be addressed. Instead, leadership has failed to adapt its ambitions to these foundational barriers, pursuing a one-size-fits-all model that constitutes what Levy (2014) would describe as

⁶⁴ Northouse, (2021), p. 2.

⁶⁵ Olonisakin, Funmi. (2018), Towards Re-conceptualising Leadership for Sustainable Peace. *Leadership & Developing Societies*, 2(1), pp. 1-30.

⁶⁶ Béché, Emmanuel (2020), Cameroon Responses to COVID-19 in the Education

Sector: Exposing an Inadequate Education System, *International Review of Education*, 66, pp.755-775

⁶⁷ Education Out Loud (2025), Strengthen Civil Society Engagement in Education Policy Planning and Monitoring. Oxfam Denmark

⁶⁸ Béché (2020), p. 768.

⁶⁹ Murhi et al (2023), p. 59.

⁷⁰ International Telecommunication Union (ITU). (2023), *Measuring Digital Development: Facts and Figures*. Geneva: ITU.

working *against* the grain of local realities.⁷¹ This results in a “policy fantasy” where grand plans exist only in official documents, completely divorced from the lived experience of students and teachers who lack the electricity to charge a device or the network coverage to load a webpage.

The Extent of Monitoring and Implementation in the Three States

While policy leadership provides the vision and framework for virtual education, its ultimate sustainability and effectiveness depend on implementation and monitoring. Evidence from these countries reveals critical systemic deficits, particularly in monitoring, evaluation, and feedback mechanisms, which cause implementation to lag even after policies are adopted. In CAR, this challenge is compounded by profound political instability and conflict, which disrupt physical safety, cause displacement, and severely undermine the continuity required for any virtual learning solution. For instance, in rural or conflict zones, teachers abandon posts, schools close, or infrastructures are destroyed.⁷² Another main reason for the poor implementation is that many virtual learning initiatives were hastily implemented during crises (e.g., COVID-19), and follow-up mechanisms to track student participation, learning outcomes, and quality of content have been weak.⁷³ In Cameroon, students reported confusion and difficulties in organising learning via WhatsApp groups or remote channels; virtual social interactions and feedback loops were not well managed.⁷⁴ This underscores that while policy leadership may establish goals and frameworks, it is the quality of implementation and monitoring that

ultimately determines the effectiveness and sustainability of virtual education initiatives.

The implementation strategy across these three countries has overwhelmingly followed a top-down, technocratic model, which is inherently ill-suited for adaptive challenges. Governments, often influenced by international donor agendas, have launched national digital education policies, such as Cameroon’s *Strategic Plan for Digital Education*⁷⁵ or the DRC’s initiatives for inclusive digitalization.⁷⁶ However, these policies are formulated in isolation from the stark infrastructural constraints documented by the International Telecommunication Union (ITU, 2023), which consistently ranks these countries lowest globally for internet affordability, broadband penetration, and electrical grid reliability. The implementation failure is, therefore, preordained.⁷⁷ As Levy argues, effective reform must “work with the grain” of local institutions and realities.⁷⁸ By attempting to impose a model of digital learning that requires high bandwidth and reliable power in contexts where these are absent, implementation efforts are faulty from the start.

The situation is further critically undermined by a near-total collapse of effective monitoring and evaluation. Monitoring is not merely a final audit but an essential feedback loop for adaptive learning and course correction, especially in complex environments.⁷⁹ However, in these countries, the monitoring and evaluation process is often reduced to merely quantifying inputs, such as the number of devices distributed or schools provided with internet access. This approach entirely fails to assess meaningful outcomes, including student engagement, learning gains, improvements in digital literacy, or teacher

⁷¹ Levy, B. (2014). *Working with the Grain: Integrating Governance and Growth in Development Strategies*. Oxford University Press.

⁷² Kossingou Ghislain, Ndassimba Nadege, Ndassimba Edgard, Gueye Kéba and Ouya Samuel (2023), Proposal of the Solution of Virtual Basic Schools in Rural Areas of African Countries in Conflict: Case of the Central African Republic. [NISS '20: Proceedings of the 3rd International Conference on Networking, Information Systems & Security](#).

⁷³ UNICEF (2020), What Have We Learnt? Findings from a Survey of Ministries of Education on National Responses to COVID-19, 28 October. Available at: <https://data.unicef.org/resources/national-education-responses-to-covid19/>. [Accessed 18 September 2025].

⁷⁴ Béché (2020), p. 770.

⁷⁵ UNICEF (2025), UNICEF and IHS Cameroon Partner on the Connect My School Initiative for Digital Learning:

Empowering digital education through strategic partnership in Cameroon. 25 May, UNICEF Cameroon.

⁷⁶ World Bank Group (2025), Inclusive Digitalization in Eastern and Southern Africa Program: Democratic Republic of Congo (DRC), 27 June. Available at: <https://www.worldbank.org/en/news/factsheet/2024/06/27/inclusive-digitalization-in-eastern-and-southern-africa-program-democratic-republic-of-congo-afe-drc>. [Accessed 18 September 2025].

⁷⁷ International Telecommunication Union (ITU). (2023), p. 6.

⁷⁸ Levy, Brian (2014), *Working with the Grain: Integrating Governance and Growth in Development Strategies*. Oxford University Press.

⁷⁹ Uwizeyimana, Dominique (2020), The Logframe as a Monitoring and Evaluation Tool for Government Interventions in a Chaotic and Complex Environment. *Africa’s Public Service Delivery & Performance Review*, 8(1), pp. 1-12.

competency. Crucially, there are no robust mechanisms to answer fundamental questions: Are these platforms actually being used? Are teachers confident in integrating technology? Which students are being left behind, and why? This critical data gap creates a vacuum of accountability. As a result, policymakers, unaware of the initiatives' failures on the ground, continue to champion the rhetoric of digital transformation, while donors, seeing their tangible inputs delivered, prematurely consider the projects a success. This cycle, as detailed in the World Bank's (2017) World Development Report on governance, is a classic symptom of weak implementation capacity where the act of mimicking successful models without their functional substance prevails.⁸⁰ The systems in the three countries appear to be modernising while fundamentally failing to function. The monitoring and evaluation process, intended as a dynamic process for learning, accountability, and improvement, is reduced to a superficial exercise focused on inputs rather than outcomes.

5. EDUCATIONAL LEADERSHIP IN THE ERA OF VIRTUAL LEARNING IN CAMEROON, CAR AND DRC

As virtual learning becomes an increasingly essential component of education in fragile, resource-constrained environments, the importance of school-level leadership and adaptive leadership practices has never been greater. In Cameroon, CAR, and DRC, school leaders have been compelled to respond rapidly – often improvising – to unprecedented disruptions, including the COVID-19 pandemic and ongoing conflict.

The first subsection of this section examines how school leadership in these countries has shaped the transition to virtual learning, highlighting both innovative strategies and significant systemic limitations, particularly regarding infrastructure, teacher preparedness, and digital capacity. The second subsection explores adaptive leadership as a flexible, context-sensitive approach capable of navigating complex challenges and fostering sustainable virtual learning. It argues that effective digital education in

these settings requires more than top-down policy directives; it demands leadership that is inclusive, equity-oriented, attuned to infrastructural realities, and grounded in meaningful collaboration with all stakeholders. Taken together, these subsections demonstrate that school leadership and adaptive leadership are not merely supportive elements but central pillars determining the success or failure of virtual learning across these three Central African states.

School Leadership and Virtual Learning in the Three States

In all three countries, educational leadership was compelled to respond rapidly by developing or approving national response plans, deploying media channels such as radio and television, launching or expanding online learning platforms, and experimenting with blended or hybrid learning models. In Cameroon, for instance, as part of its national response strategy, the government expanded digital platforms (*MonÉcoleEnLigne*, *MySchoolOnline*, and *SukuluOnline*) and developed various digital content formats to support learners during the crisis.⁸¹ In the DRC, leadership has decreed regulation of distance learning across primary, secondary, and technical education, combining radio, television, offline materials, and platforms to try to reach low-connectivity areas.⁸² While the strategies adopted in both countries represent a necessary and timely response to the educational crisis, their implementation exposes a critical challenge: the deep digital and infrastructural divide. This divide is particularly stark in rural areas, where reliance on digital platforms, television, and online learning inevitably excludes communities that lack access to even the most basic utilities.

In the DRC, universities and institutions in places like Bukavu have struggled to adopt e-learning because of under-equipment and low ICT knowledge among instructors.⁸³ Educational leadership in the transition to virtual learning is also notably shaped by a generational divide between younger teachers, who are generally more familiar with new media, and older teachers, who often struggle to keep pace with the rapid advancements of digital technology. This divide highlights the urgent

⁸⁰ World Bank Group (2017), *World Development Report 2017: Governance and the Law*. Washington, DC: The World Bank.

⁸¹ UNESCO (2021), *Embracing Distance Education in Cameroon: Ensuring Continuity during COVID-19 Crisis*. Available at: <https://www.unesco.org/en/early-childhood-education/embracing-distance-education-cameroon-ensuring-continuity-during-covid-19-crisis>. [Accessed 18 September 2025].

⁸² Njoya, Samira (2025), *DRC Introduces Distance Learning to Overcome Educational Challenges*, Tech Africa, 7 February. Available at: <https://www.wearotech.africa/en/files-uk/news/tech/drc-introduces-distance-learning-to-overcome-educational-challenges>. [Accessed 18 September 2025].

⁸³ Murhi et al (2023), p. 57.

need for all teachers to effectively adopt and integrate digital tools into their professional practice.⁸⁴ Similarly, in both CAR and Cameroon, secondary school principals often lack adequate training and experience in digital leadership and technology-mediated supervision, leaving them ill-prepared to support teachers during transitions to online or blended learning models.⁸⁵ While there has been some responsiveness from leadership under pressure, this has not been matched by a corresponding level of preparedness. Infrastructure, resources, teacher readiness, and monitoring systems remain weak. As a result, although leadership efforts may demonstrate agility, the underlying fragility significantly limits their overall effectiveness.

Some steps in the DRC have been taken to address the digital capacity challenges faced by teachers and school administrators. As schools are being relocated due to insecurity, teacher training initiatives are underway to support the shift toward digital education. These efforts include training teachers in the use of digital tools and platforms, remote student supervision, the use of educational apps on mobile phones, and the creation of digital content.⁸⁶ This indicates that school leadership (principals and local supervisors) is increasingly being called upon to manage the transition to virtual and distance learning modalities, often under highly challenging conditions. However, the teacher training in displaced/relocated schools (Ituri) covers only around a hundred teachers in specific territories. That is commendable, but relative to the population of displaced schools and teachers across DRC, this is small and localized. Scaling beyond pilot zones remains a challenge.⁸⁷

School leadership is a decisive factor in the success or failure of virtual learning in Cameroon, CAR and DRC. Leaders influence critical dimensions such as the selection of digital tools, teacher training and support, the structure and quality of virtual instruction, equitable access, assessment and monitoring processes, and overall staff morale. In Cameroon, school leadership has demonstrated both encouraging practices, such as teacher-driven digital initiatives and blended learning in areas affected by crisis, as well as notable shortcomings, including ineffective implementation of electronic learning strategies, weak institutional structures, and limited overall impact.⁸⁸ In the DRC, particularly in regions affected by displacement and insecurity, school leadership is beginning to adapt through digitalisation efforts, teacher training, and the use of radio and audio instruction. However, significant challenges persist at the impact level.⁸⁹ In CAR, schools largely depend on international partners to bridge digitalisation gaps,⁹⁰ often with insufficient recognition of the strategic and systemic role that local school leaders should play in driving sustainable virtual learning.

What Adaptive Leadership for Effective Virtual Learning in the Three States?

Leadership matters because in virtual settings, many of the usual supports (physical proximity, direct supervision, classroom structures) are weakened; leadership can stabilize, compensate or make virtual provision more equitable and effective. Adaptive leadership, as articulated by Heifetz et al., refers to a form of leadership that is flexible, responsive, and capable of learning. It involves the ability to distribute authority and effectively navigate changing

⁸⁴ Fatshimetrie (2024), Integrating Digital Technology into Education in the Democratic Republic of Congo: Issues and Challenges, 9 October. Available at:

<https://eng.fatshimetrie.org/2024/10/09/integrating-digital-technology-into-education-in-the-democratic-republic-of-congo-issues-and-challenges>. [Accessed 19 September 2025].

⁸⁵ Fokong Hilda, Tendong Elvis and Ambengwa Stefanie (2024), Effects of Teachers' Digital Leadership on Students' Learning Outcomes in Selected Secondary Schools in Mfoundi Division-Cameroon, *American Journal of Education and Practice* 8(5), pp. 79-96.

⁸⁶ Binzaka Roger, Okebukola Peter, Shabani Juma and Byamungu David (2024), Outlines of the Preparation and Integration of ICT Tools in the Educational Institutions in the Democratic Republic of Congo Context. *Open Journal of Social Sciences*, 12(01), pp. 251-264.

⁸⁷ Fatshimetrie (2023), Teacher Training in the DRC: Digitalization of the Education System to Overcome Insecurity, 17 September. Available at:

<https://eng.fatshimetrie.org/2023/09/17/teacher-training-in-the-drc-digitalization-of-the-education-system-to-overcome-insecurity>. [Accessed 19 September 2025].

⁸⁸ Suh, Isidor and Len, Kibinkiri (2023), Blended Learning and Professional Development of Student-teachers in the English-speaking Regions of Cameroon, *Journal of Education and Teaching Methods*, 2(2), pp. 1-19.

⁸⁹ UNICEF (2024), An Alternative Learning Opportunity for Displaced Children: Radio Programs Allow Children Displaced by Violence in Eastern DRC to Continue their Education, 7 August. Available at:

<https://www.unicef.org/drcongo/en/stories/alternative-learning-opportunity-displaced-children>. [Accessed 21 September 2025].

⁹⁰ ECW (2025), In CAR, Schools Largely Depend on International Partners to Bridge Digitalisation Gaps, Often with Insufficient Recognition of the Strategic and Systemic Role that Local School Leaders Should Play in Driving Sustainable Virtual Learning, 7 June. UNICEF CAR.

circumstances, rather than adhering rigidly to predetermined plans.⁹¹ In virtual learning contexts, adaptive leadership needs to deal not only with technical issues (platforms, devices, connectivity) but also with human, pedagogical, institutional, and equity challenges, especially in resource-constrained environments. In both the DRC and Cameroon, the transition to virtual learning has revealed a degree of resilience, attributed in part to the presence of adaptive leadership. In the DRC, particularly in Bukavu, higher education institutions attempted to transition to e-learning during the COVID-19 pandemic despite being severely under-equipped, underfunded, and facing inadequate teacher preparedness. Many instructors were forced to rely on a "trial and error" approach in using ICT tools, highlighting both the challenges and the improvisational efforts made in the absence of structured support.⁹² In Cameroon, during the COVID-19 lockdown, virtual autonomous learning was employed, despite poorly-structured digital educational environments. Students voiced a clear need for pedagogical approaches better suited to virtual learning, calling for increased interactivity, more coherent instructional structure, and improved communication between students, teachers, and learning content.⁹³ Drawing on the findings related to the challenges of virtual learning in the three Central African states, this study advocates for an adaptive leadership approach that incorporates the following key actions: The development of responsive policies and adaptable strategies; a strong awareness of infrastructural limitations coupled with innovative solutions; the enhancement of teacher capacity and adaptation of pedagogical practices; the establishment of effective monitoring and evaluation mechanisms; a clear commitment to equity, inclusion, and learner safety; and active engagement and collaboration with all relevant stakeholders.

Responsive policies and adaptive strategies: Adaptive leaders must be able to translate broad policy mandates into context-sensitive strategies that respond to local conditions. Effective policies should allow for flexibility, enabling shifts between online, blended, radio/TV, or offline learning modalities based on factors such as internet access, infrastructure, and security. For instance, when the government of DRC mandated

environments. Adaptive leadership for virtual learning in Cameroon, CAR, and DRC means leadership that is flexible, responsive, and sensitive to local conditions, able to innovate with limited resources, prioritise equity, monitor outcomes, and evolve over time.

distance learning in conflict-affected eastern regions, adaptive leadership involved establishing a commission to monitor local realities and adjust implementation strategies accordingly.⁹⁴ The blended learning approaches have equally been observed in Cameroon's English-speaking regions, amid the socio-political crisis and COVID-19 pandemic.⁹⁵ The policy must be systematically responsive and adaptable to local realities to make distance learning effective across the three Central African states.

A strong awareness of infrastructural limitations coupled with innovative solutions: Because infrastructure is uneven and often fragile, adaptive leaders must have an acute understanding of what is available locally (electricity, connectivity, devices). They must deploy low-tech or offline solutions where needed, or hybrid models where possible. For instance, in Cameroon, there is a disparity between infrastructural potential and actual utilisation;⁹⁶ In CAR many regions of the country continue to face isolation and limited digital capacity.⁹⁷ The DRC case in the East shows that power disruptions and damaged infrastructure limit what purely online models can accomplish.⁹⁸ Adaptive leadership would anticipate these, plan for backup modalities, possibly mobile or radio, or focused offline content.

The enhancement of teacher capacity and adaptation of pedagogical practices: Virtual learning is not simply replicating in-person classes via the internet; the pedagogy must be adapted: more interactive content, asynchronous options, scaffolding, clarity, frequent feedback. Adaptive leaders should train teachers not only in using ICT tools but in new pedagogical models. The Cameroon students' feedback during lockdown indicates lack of structure and interaction undermined effectiveness.⁹⁹ Also, addressing generational divides in teacher comfort with digital tools is necessary (this arises in the DRC case: younger teachers are more familiar, older less so), so leadership must provide differentiated support and mentorship.¹⁰⁰

⁹¹ Heifetz et al (2009), p. 2.

⁹² Murhi et al (2023), p. 57.

⁹³ Ngamaleu, Rodrigue (2020), L'apprentissage autonome virtuel d'étudiants confinés au Cameroun. *International Journal of Technologies in Higher Education*, 17(3), pp. 117-129.

⁹⁴ De Souza, Ovier (2025), "DR Congo: E-Learning Adopted Amidst Conflict in Eastern Region", *BANKABLE*, 17 Fevrier.

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⁹⁵ Suh (2023), p. 5.

⁹⁶ Mbodiam, Brice (2025), p. 1.

⁹⁷ African Development Bank Group (2024), p. 3.

⁹⁸ De Souza, Ovier (2025), p. 1.

⁹⁹ Ngamaleu (2020), p. 118.

¹⁰⁰ Fatshimetrie (2024), p. 1.

The establishment of effective monitoring and evaluation mechanisms: Adaptive leadership requires gathering data (on learner participation, access, dropout, learning outcomes) and using that data to adjust strategies. Systems to track student participation, digital engagement, and learning outcomes; tools to collect feedback from students and teachers; responsive adaptation. For the three countries, there is a need for mechanisms to answer the following critical questions: Are the platforms being used? Are teachers confident? Which students are being left behind and why? Without feedback loops, virtual learning initiatives tend to become static, sustaining what was planned rather than what works. *A clear commitment to equity, inclusion, and learner safety:* Virtual learning amplifies existing inequalities. Adaptive leaders must intentionally plan inclusion of marginalized learners (rural, conflict-affected, low-income) by ensuring alternative modalities, supporting access to devices, and providing safe learning environments. Given the significant disparity in access to virtual learning between students in urban and rural areas across all three countries, coupled with their status as conflict-affected states, there is a critical need to prioritise inclusion and ensure the safety of all learners. *Active engagement and collaboration with all relevant stakeholders:* Adaptive leadership requires engaging teachers, students, parents, and communities to understand constraints, needs, and co-create feasible solutions. Also, collaborating with non-governmental organisations and technology providers, community groups can help mobilise resources, fill infrastructure gaps, and provide training.

Adaptive leadership for effective virtual learning in Cameroon, DRC, and CAR requires a multifaceted approach: leaders must be flexible, context-aware, transformational, and equity-oriented; they must support teachers, adapt modalities, monitor outcomes, and mobilize resources. Evidence from Cameroon and parts of DRC shows that while some adaptive practices are emerging (e.g., mix of modalities, decrees mandating distance learning, teacher experiences), much remains to be done: structural constraints are real and sustainable, inclusive adaptation is difficult but essential. CAR, trapped in infrastructural deficits and instability, faces even more severe constraints but also stands to benefit perhaps the most from adaptive leadership.

6. CONCLUSION

The transformation of education through virtual learning in Central Africa, particularly in Cameroon, CAR, and DRC, simultaneously reveals the potential of

digital technology and the deep structural inequalities that hinder its full realisation. This study set out to interrogate the kind of leadership process that can make virtual learning viable and effective in three Central African countries. Through the lens of Adaptive Leadership Theory, the research critically examined how leadership understood not merely as positional authority but as a distributed, dynamic process, can address the entrenched challenges of digital education in these fragile contexts. It is buttressed in this study that the transition to virtual learning in Central Africa cannot be driven by technology alone, nor can it rely solely on high-level policy pronouncements. It must be grounded in a leadership process that is adaptive, inclusive, and locally empowered. Only through such leadership can the selected countries of the region begin to close the digital divide and build educational systems that are resilient, equitable, and future-ready. The study thus calls for a reconfiguration of leadership at all levels, from ministries to classrooms, anchored in responsiveness, shared responsibility, and long-term vision.

The study's findings bring several critical challenges to the fore. Foremost is the inadequacy of digital infrastructure, a situation exacerbated by unreliable electricity and limited internet penetration, which collectively cripple the implementation of virtual learning. These systemic shortcomings are further compounded by weak policy execution, wherein national-level commitments to digital education consistently fail to translate into practical, sustainable strategies on the ground. Despite policy documents and strategic frameworks acknowledging the importance of virtual learning, the absence of effective implementation mechanisms results in a persistent gap between rhetoric and reality. Moreover, the study found that policy leadership in the three countries often remains centralised and disconnected from local school-level realities. This top-down model limits responsiveness, stifles innovation, and fails to account for local contexts and constraints. The assessment of implementation and monitoring across the three states shows that leadership processes are often reactive rather than proactive. This undermines accountability and obstructs data-informed adjustments that are essential to adaptive leadership.

Given these systemic shortcomings, this study contends that a more promising path forward lies in the adaptive leadership processes observed in isolated instances across Cameroon and the DRC. In these cases, school and community leaders have proactively leveraged low-

tech, accessible means to deliver virtual or hybrid learning, albeit on a limited scale. These examples demonstrate the potential of school-based leadership to bridge the policy-practice divide when given autonomy and support. However, in CAR, where education systems are even more fragile, such leadership practices are rare and often unsupported, underscoring the urgent need for decentralised models of leadership that can thrive even in post-conflict and low-resource settings. Effective school leadership, especially when grounded in adaptive and collaborative practices, can also mitigate many systemic shortcomings by fostering local innovation, encouraging peer learning, and ensuring that educational interventions are tailored to community realities. Such leadership ultimately requires deliberate investment in professional development, infrastructure, and decentralised authority.

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