PERSPECTIVE PAPER

Challenges and opportunities for higher education in Africa: a path to sustainable development

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ABSTRACT

Africa is undergoing rapid population growth and a significant "youth bulge," with its workforce projected to become the largest globally by 2040. While tertiary education enrollment has risen, the Gross Enrollment Ratio remains the lowest in the world, reflecting ongoing challenges in the sector. This study employed secondary data and a desk review to examine the history and current state of higher education in African countries, identifying key challenges such as inadequate funding, insufficient infrastructure, and misalignment with labor market demands. Political instability and economic constraints, particularly in countries around West Africa and Sudan, exacerbate these issues. The findings highlight a unique opportunity for economic and social transformation through strategic investment in education systems and workforce development, such as the engagement of Public-Private Partnership and Digital Technology for higher education development in Africa. Prioritizing these interventions is essential to harness the region's demographic potential and promote sustainable growth.

KEYWORDS:
Africa, challenges and opportunities, digital technology, higher education, funding, public-private partnership, political instability, sustainable development

INTRODUCTION

Education plays a pivotal role in boosting productivity by enhancing workforce skills, promoting innovation, and improving resource management. It equips individuals with the knowledge and abilities to perform tasks more efficiently, driving economic growth and higher production levels[1]. Research shows that each additional year of schooling significantly raises productivity, particularly in developing economies where the need for skilled labor is critical[2]. Moreover, education fosters innovation by enabling workers to adopt and implement new technologies and processes, which strengthens global competitiveness[3]. Additionally, educated individuals utilize resources more effectively, as seen in agriculture, where farmers with education achieve better yields through using modern techniques[4]. Prioritizing access to quality education is essential for sustained economic growth and efficient production.

The concept of sustainable development was popularized by the 1987 Brundtland Commission Report. It refers to a pattern of growth that satisfies the needs of the current generation without limiting the ability of future generations to meet their own needs[5]. Economically, if we interpret "development" as an increase in utility or well-being, then sustainable development implies a trajectory where per capita utility does not decline over time[5]. In Africa, sustainability is challenged by issues such as poverty, food insecurity, disease, land degradation, water scarcity, climate change, conflict, and urbanization. Recognizing the critical role of education in addressing these challenges, the 1992 UN Conference in Rio emphasized education as a key tool for sustainable development. This led to the UN declaring 2005–2014 the Decade of Education for Sustainable Development, aiming to embed sustainability principles into education systems and promote a future grounded in environmental, economic, and social well-being[6].

Higher education in Africa faces serious challenges, with limited access and low enrollment, around 5%, being among the most pressing[7]. Despite increasing demand, many students, especially from rural areas, are held back by poor infrastructure, financial barriers, and socio-cultural factors. Funding remains a major issue, as most educational resources are directed toward primary and secondary levels. According to Bloom et al.[8], higher education received 17% of the World Bank's global education investment between 1985 and 1989, but this dropped to just 7% by the late 1990s, making it even harder for many African countries to maintain and expand their higher education systems.

The above-mentioned challenges are further compounded by the issues of insurgencies, coups, kidnapping, banditry, terrorism, and Boko Haram across the African continent[9]. The implications of which include in some cases closure of schools, kidnapping of students and staff for ransom. In other cases, this has led to death and forced migration to safer areas[10]. These affect higher education and sustainable development.

Many higher education institutions face overcrowding, limited research capacity, and a shortage of qualified faculty, challenges worsened by brain drain. Access remains deeply unequal, especially for women and rural communities, and is further hindered by high tuition costs and poor digital infrastructure. Governance issues, political instability, and the lasting impact of crises like COVID-19 continue to strain the system[7,8]. Additionally, the use of colonial languages and pressures from globalization deepen educational disparities. Tackling these challenges requires greater investment, targeted policy reforms, infrastructure improvements, and stronger partnerships across governments, the private sector, and global organizations to fully realize the role of higher education in Africa's development.

Higher education in Africa faces significant challenges in meeting the growing demand for access and quality. Limited enrollment opportunities, particularly for women and rural populations, are exacerbated by high costs, outdated infrastructure, and a shortage of qualified faculty. According to the United Nations[11], sub-Saharan Africa Gender Parity Index (GPI = 0.66) and South and West Asia (GPI = 0.76) are the only regions where the GPI for tertiary education enrollment remains below one, reflecting persistent gender inequalities. In addition, brain drain, weak research capacity, and poor digital access further hinder progress. Political instability, governance issues, and the lingering effects

of crises such as COVID-19 have intensified these problems. Without significant investment, innovation, and coordinated reform, higher education across the continent risks falling short of its crucial role in promoting inclusive and sustainable development.

METHODS

This study employed a descriptive research design, combining a desk review with secondary data analysis to explore the challenges and opportunities of higher education in Africa and its contribution to sustainable development. The desk review involved a thorough examination of existing literature, policy documents, and relevant reports, identified through targeted searches on Google and Google Scholar using predefined keywords.

To enrich the qualitative findings, secondary data were sourced from reputable global databases, including those of the World Bank, the International Labor Organization (ILO), and UNICEF. These data provided quantitative insights that supported and strengthened the overall analysis. Prior to analysis, the data were assessed for consistency across time periods and sources to ensure validity and reliability.

Descriptive analyses were conducted, focusing on indicators such as government expenditure on education and the alignment between higher education and labor market needs across African countries. This integrated approach, combining desk review with secondary data analysis, enabled a comprehensive and evidence-based understanding of the research topic, grounded in both qualitative and quantitative dimensions.

RESULTS

This section summarizes the findings from the desk review and secondary data analysis regarding the state of higher education in Africa.

Top ten countries in higher education Performance
While African countries face serious challenges in higher education, several nations, including Seychelles, Tunisia, Mauritius, and South Africa, have made notable progress by prioritizing educational quality, investing in research, and developing global partnerships. Ten

countries were identified as the top performers in higher education in Africa, based on a combination of literacy rates, education investment, global rankings, and accessibility.

Seychelles exemplifies educational excellence in Africa. With a population of approximately 120,581 and a GDP per capita of $16.7 billion (2023). The country has built a robust education system. It has achieved UNESCO's "Education for All" goal, boasts a literacy rate of 95%, and provides free education up to the age of 18. Key factors include a strong emphasis on teacher training, digital literacy, and investments in technology. Seychelles sets a high standard for quality education and critical thinking in Africa[12].

Tunisia's education system ranks 71st globally with a 61.4% excellence rate, supported by the government's allocation of 20% of its budget to education. Education is free and compulsory until secondary school, contributing to high literacy rates, particularly among youth, with 96.1% of 15- 24-year-olds literate. Despite these achievements, challenges such as high unemployment among women and graduates persist. However, with continued reforms and an anticipated 4% economic growth, Tunisia is poised to further strengthen its education system[13].

Mauritius is ranked 47th globally for vocational training and 74th for overall education, making it the 3rd best education system in Africa. Education is free and accessible to all, with the government's strategic investments driving significant achievements. Strategic investments in education have a pivotal role in driving economic growth. Recognizing this role, the Organization for Economic Co-operation and Development (OECD) convened a Policy Conference on Economic Growth and Investment in Education in Washington, D.C., since October 1961. This gathering united policymakers, economists, and experts from member countries to synchronize educational policies with economic objectives, set educational investment targets through 1970, and address the urgent educational expansion needs of developing nations[14].

Mauritius ranks 1st in Africa in the Rule of Law index and was the 2nd in the UN Human Development Ranking in 2007. These accomplishments highlight the country's

focus on quality education and vocational training, contributing to its economic and social progress while serving as an inspiration for other nations[15].

South Africa takes pride in its robust higher education system, serving as a pillar of academic excellence on the continent. The country is home to several top-ranking universities in Africa, including Stellenbosch University, the University of the Witwatersrand, and the University of KwaZulu-Natal, all of which rank among the top 10 on the continent. The South African government demonstrates its commitment to advancing education by allocating approximately 18% of the national budget to the sector, reflecting ongoing efforts to strengthen the education system[16].

Higher education in Algeria is offered through 27 universities, 13 university centers, 6 national schools, 6 national institutes, 4 teacher-training institutes, and 2 university annexes. Universities and university centers are managed by the Ministry of Higher Education and Scientific Research, while specialized schools and institutes are overseen by ministries related to their specific fields[17]. Most universities are in northern coastal areas and follow a French-style system, comprising faculties divided into academic departments. University centers, typically located in remote regions, historically offered limited programs tailored to local workforce needs, focusing on training professionals and technicians. However, many centers have recently expanded their offerings, with some being upgraded to universities[17].

Botswana is a leading country in Africa's education sector, with a population of 2.3 million and an impressive literacy rate of 88%[18]. Botswana ranks as the 92nd best country globally for higher education and 6th in Africa. Additionally, the country invests in adult education, enabling learners over 25 to pursue higher education[18]. Many adult learners enroll in tertiary institutions to enhance their socio-economic status, secure better-paying jobs, gain promotions, or acquire additional knowledge[18].

Kenya ranks 7th in Africa for education, with a score of 55.4 points, reflecting its growing emphasis on access and institutional quality. It's also the 95th best globally for education[19].The country has a high literacy rate of 78.7% and spends 17.58% of its budget on education[19]. It has a well-organized education system. Kenya's higher education is also strong. It has many top universities like the University of Nairobi and Kenyatta University[19]. These schools made Kenya a center for learning in Africa. The latest estimates by the World Bank suggest that human capital wealth in Kenya accounts for 69 percent of national wealth. Human capital is measured as the present value of the future earnings of the labor force, which in turn depends on the level of educational attainment of the labor force. However, Kenya faces some big challenges in education. Over 1.57 million kids in dry areas might not go to school because of drought[19].

Cape Verde is a small island nation in the Atlantic Ocean with an area of 4,033 km^2, and total population 0.55 million people in 2019 with youth population consisting of 37%. It has become a leader in education in Africa. The country ranks 98th globally and 8th in Africa, with a score of 53.3 points[16]. This shows the government's strong commitment to free and compulsory education.
To make sure that every child can learn well in Cape Verde, the government offers free schooling from age 6 to 14[16]. The government has invested a lot in schools, teachers, and learning materials.

Moreover, Cape Verde's universities are getting better in rankings, and has been doing good at vocational training and lifelong learning. Over 150,000 people, mostly women, have benefited from programs[14]. This shows Cape Verde's effort to include everyone in education and work. Despite the ongoing challenges, Cape Verde continues to make measurable progress in expanding access to quality education[16].

Egypt ranks 9th in Africa and 99th worldwide[16]. It boasts a literacy rate of 73.1%, reflecting its longstanding investment in academic and human capital development. Universities like Cairo and Alexandria are known for their excellence. They have helped shape many leaders and innovators. This has made Egypt's educational history rich and influential. Egypt is working hard to improve digital skills in its students. It ranks 70th globally in digital skills. The country is focusing on giving students the digital tools they need. This is part of

Egypt's plan to become a center of innovation and technology[16].

Namibia is the 10th top country for higher education in Africa[16]. It has a population of 2.1million people and covers about 823,000 km². Namibia has focused on teaching critical thinking skills since attaining independence[16]. Namibia is not as famous as some top African education countries. Nevertheless, it stands out by teaching students to think critically and creatively. This education prepares the next generation of leaders to face challenges and drive progress. Despite its strengths, Namibia faces challenges in education. It lacks data on student enrollment, attendance, and learning outcomes[16]. Also, there's not enough information on teacher quality and education funding. Namibia's focus on critical thinking makes it a rising star in African education. By fixing data gaps and using its strengths, Namibia can improve its education system[16].

Challenges in higher education financing and infrastructure in sub-Saharan Africa

Although enrollment in higher education across Africa has more than doubled, from 4% in 2000 to 9% in 2021, it still falls far below the global average of 38%[6]. This modest progress highlights the persistent challenges facing the region, particularly in sub-Saharan Africa (SSA), where chronic underinvestment continues to restrict access, undermine quality, and limit institutions' ability to meet growing demand.

As shown in Table 1, only seven SSA countries allocate more than 6% of their GDP to education. Notably, four of these countries rank among the top ten for higher education in Africa. In contrast, most African nations invest less than 3%, significantly weakening their capacity to build resilient education systems and support long-term development.

Table 1. Government spending on education as a percentage of GDP, Africa 2021

Country	Spending on education as % of GDP	Country	Spending on education as % of GDP
Namibia	10.39	Burundi	4.87
Sierra Leone	9.44	Mauritius	4.67
Lesotho	7.51	Mali	4.36
Tunisia	6.68	Togo	4.23
South Africa	6.55	Ethiopia	4.07
Mozambique	6.5	Niger	3.82
Cape Verde	6.04	R. of Congo	3.67
Morocco	5.64	Ghana	3.42
Seychelles	5.62	Ivory Coast	3.33
Senegal	5.61	Benin	3.2
Rwanda	5.59	Madagascar	3.2
Algeria	5.51	Tanzania	3.12
Burkina Faso	5.22	Zambia	3.11
Kenya	4.89	Gambia	3.04

Source: Global Economy: https://www.theglobaleconomy.com/educators.php

A growing mismatch exists between academic programs and labor market demands (Table 2), particularly in Sudan, where graduates are often underemployed. Political instability, economic sanctions, and frequent strikes have disrupted higher education, contributing to brain drain and declining quality[20].

Infrastructural limitations are widespread. Many SSA institutions lack modern facilities, internet access, and resources for both traditional and online learning. While private universities are often better equipped, public institutions, which serve the majority of students, continue to suffer from chronic underfunding, limiting their ability to provide quality education

Overall, while certain African countries show encouraging progress, systemic financial, political, and infrastructural challenges continue to hinder the broader development of higher education across the continent.

Table 2. Mismatch between education and workplace requirements, Africa 2024

Countries	Percentage of workers with education above requirements (both sexes), most recent measure (2014-2023).	Percentage of workers with education matching requirements (both sexes), most recent measure (2014-2023)	Percentage of workers with education below requirements (both sexes), most recent measure (2014-2023)
Angola	3.2	28.1	68.8
Botswana	31.5	47.7	20.7
Mozambique	2.1	14.8	83.0
Namibia	17.0	42.9	40.1
South Africa	32.8	49.0	18.2
Zambia	8.8	48.8	42.4
Zimbabwe	28.2	56.2	15.7
Cameroon	6.0	32.2	61.8
Chad*	1.8	13.5	84.7
Kenya	26.6	41.6	31.8
Madagascar	23.4	36.6	40.0
Mauritius	11.1	56.4	32.5
Rwanda	8.9	52.7	38.4
Sudan	8.5	19.1	72.3
Tanzania	3.2	8.8	88.0
Uganda	6.3	35.9	57.8
Egypt	8.2	37.3	54.5
Morocco	6.0	26.1	67.9
Tunisia	14.1	47.1	38.8
Benin	4.3	15.3	80.5
Burkina Faso	1.1	6.0	92.9
Cabo Verde*	18.3	44.9	36.8
Côte d'Ivoire	3.9	9.6	86.5
Gambia	8.3	35.5	56.2
Ghana	6.8	48.0	45.2
Guinea	12.3	23.4	64.3
Guinea-Bissau	4.6	17.9	77.5
Liberia	6.8	29.1	64.1
Mali	1.2	4.6	94.3
Niger	1.6	11.4	86.9
Nigeria	7.7	48.2	44.1
Senegal	7.1	22.1	70.8
Sierra Leone	2.6	18.4	79.0
Togo	2.8	12.9	84.4
Africa	10.2	31.0	58.8

Source: International Labor Organization - ILOSTAT (retrieved 03-03-2024

DISCUSSION

Summary of Key Findings

This analysis shows a mixed pattern of progress and persistent challenges in African higher education. A handful of countries, including Seychelles, Tunisia, Mauritius, and South Africa, have positioned themselves as leaders by committing resources to educational quality, fostering international partnerships, and aligning policies with national development goals. Mauritius ranks highest in vocational training and rule of law, while Tunisia allocates 20% of its national budget to education[12]. Kenya offers another example, where 69% of national wealth is linked to human capital[18]. These countries have benefited from strategic governance, expanded access, and digital skills development to create more inclusive and forward-looking systems[6,15].

However, in much of SSA, progress is constrained by systemic weaknesses. While enrolment has increased, chronic underfunding has reduced institutional capacity, leading to inadequate infrastructure, outdated programs, and poor alignment between academic training and labour market needs. This disconnect has contributed to underemployment and weak graduate outcomes. In Sudan, for example, a mismatch between university programs and employment opportunities has resulted in widespread graduate underemployment[20,21]. Across the region, overcrowded classrooms, limited libraries and internet access, and weak digital infrastructure remain major obstacles[22]. Public universities, often the only option for many, are severely underfunded, while better-equipped private institutions remain inaccessible to low-income populations[23].

Conflict and humanitarian crises have further undermined progress. SSA hosts over 18.8 million internally displaced people, representing about 26% of the global total, many of whom are young people without access to learning[24]. In conflict zones such as the Central African Republic, schools are often destroyed or occupied, displacing thousands of students[25]. In Nigeria, recurring kidnappings of students, teachers, and administrators have disrupted education for decades[26]. Sudan's once-promising higher education system, expanded during the

"Revolution of Higher Education" in the late 1990s, has seen a decline in quality, with institutions such as Nileen University and Omdurman Ahlia suffering war-related damage and a growing brain drain[10,21].

Demographic change has added urgency. Africa's population is projected to reach 1.5 billion by 2024, with the highest natural growth rate globally[27]. By 2025, one in four people under the age of 25 will live on the continent[28]. Demand for higher education is also increasing among adult learners, driven in part by rising incomes[6]. Yet most governments lack the investment needed to match this demand. Heavy reliance on donor funding creates vulnerability, and without adequate subsidies, students face high tuition fees[23]. The quality gap between public and private institutions persists, with many public universities lacking modern libraries, science labs, and reliable internet. Overcrowding and insufficient digital infrastructure directly affect student learning, faculty performance, and institutional competitiveness[22].

Despite these barriers, technology presents opportunities. COVID-19 spurred digital adoption, highlighting ICT's potential to widen access, improve research, and align education with labour market needs. Rwanda and Kenya are expanding digital infrastructure, South Africa and Egypt sustain strong research institutions, Ghana and Nigeria promote private sector engagement, Senegal advances technical education, and Ethiopia builds regional university networks[29]. Public-private partnerships, particularly with telecom companies, can strengthen Higher Education Management Information Systems (HEMIS) and support data-driven planning[30].

Strengths and Limitations of the Study

A strength of this study is its use of recent, credible sources, primarily from the World Bank, the International Labour Organization (ILO), and UNICEF. This approach ensured coverage of both regional trends and country-level examples, enabling a multi-dimensional perspective that integrates governance, access, curriculum relevance, and technology adoption.

The study's reliance on secondary data is also its main limitation. Many datasets were collected for other

purposes, using varying definitions, measurement standards, and time frames, which complicates direct comparison. Some figures may reflect institutional or political biases from their context of origin. Efforts were made to mitigate these issues by prioritising the most up-to-date and reliable information, but data gaps remain, particularly for conflict-affected and under-researched areas.

Comparison with Previous Studies

These findings align with previous research that identified governance reform, curriculum relevance, and digital integration as essential for improving higher education outcomes in Africa. Earlier comparative work also highlights the persistent structural disadvantages faced by African systems when measured against regions such as Asia. While both Africa and Asia contend with graduate employability gaps, digital inequities, and quality assurance challenges, Asian countries, including China, South Korea, and Singapore, have invested heavily in research capacity and digital transformation, establishing themselves as global leaders[31,32]. Even countries such as India, Indonesia, and Bangladesh, despite ongoing challenges, have made faster progress than most African nations in expanding access and integrating technology since COVID-19[33-35].

Interpretation of the Findings

The results suggest that progress is concentrated in countries where governance is strong, resources are allocated strategically, and education systems are linked to national development priorities. In settings where these conditions are absent, higher education often stagnates or declines. Political instability and conflict worsen existing weaknesses, reducing institutional resilience and capacity. Overreliance on external funding without sustainable domestic financing leaves institutions vulnerable to funding shifts and policy changes. In addition, the lack of alignment between curricula and labor market demands reduces the employability of graduates and limits the broader economic impact of higher education.

Implications of Findings

Several policy actions emerge from this analysis. Granting universities greater autonomy could improve governance and make policy implementation more effective. Expanding access through digital platforms and open learning would help close geographic and socio-economic gaps. Curriculum reform to reflect current and future labour market needs is critical for improving employment outcomes. Sustained investment in research and innovation can strengthen academic quality and contribute to economic growth. Building stronger public-private partnerships would mobilise resources, enhance ICT capacity, and improve management systems. Addressing inequalities, both between public and private institutions and across regions, will be essential for creating inclusive, competitive systems capable of supporting Africa's long-term development goals.

CONCLUSION

Africa, the world's youngest region, is experiencing rapid population growth, with its workforce projected to be the largest globally by 2040. This demographic shift offers significant economic potential but also presents challenges such as low access to higher education, youth unemployment, and misaligned academic programs. Despite tertiary education growing annually, the region's Gross Enrollment Ratio remains the lowest in the world. Limited funding, poor infrastructure, and political instability, as seen in Sudan, further hinder progress, leading to brain drain and declining educational quality. Strategic investments, stronger university-industry collaboration, and equitable policies are essential for transforming the region's youth population into a driver of sustainable development.

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CONFLICT OF INTEREST

None declared

AUTHORS' CONTRIBUTIONS

All authors collaboratively designed the study. The first author drafted the initial manuscript. Subsequently, all authors reviewed and approved the final version.

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