

## REVIEW

# Impact of investment in EdTech: Government and entrepreneurial partnership venture in education in North and West Africa

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**Abstract:** The educational landscape in North and West Africa stands to gain significant advantages through collaborative government-entrepreneurial investments in Educational Technology (EdTech). The establishment of public-private partnerships plays a pivotal role in effectively infusing technology into education systems, thereby enhancing student accessibility, improving educational quality, and fostering better learning outcomes. Beyond its immediate impact on education, EdTech investments also hold the potential to stimulate economic growth. Moreover, these investments can nurture a pool of indigenous entrepreneurs armed with expertise in both business and information technology, thereby contributing to the expansion of the EdTech sector. This burgeoning sector, prevalent in emerging regions, becomes a magnet for foreign investments, effectively bolstering national economies and creating ripple effects across diverse industries. Such synergistic collaborations within the EdTech sphere underscore the political commitment of governments toward the advancement of education. This dedication resonates on a global scale, attracting the attention of international organizations and donor nations, as investing in education for sustainable development fosters not only improved socio-economic conditions but also favorable diplomatic relationships. This research investigates the impact of collaborative EdTech investments between governments and entrepreneurial entities on the education. By examining specific case studies within North and West Africa, namely Ghana, Nigeria, Morocco, and Algeria, it becomes evident that technology-driven educational reforms can lead to profound improvements in accessibility, educational quality, economic growth, and even political alliances. Through a comprehensive exploration of the interplay between government initiatives and entrepreneurial endeavors, this review paper delves into the multifaceted outcomes of EdTech investments across these nations.

**Keywords:** EdTech, North and West Africa, political alliances, socio-economic trajectory, educational quality

## 1 Introduction

In recent years, educational technology (EdTech) has emerged as a transformative force in global education systems, with governments and entrepreneurs increasingly recognizing its potential to revolutionize learning environments. The realm of education is undergoing a profound transformation driven by the integration of educational technology (EdTech). This research delves into the intricate landscape of EdTech investments facilitated through collaborative efforts between governments and entrepreneurial entities in the North and West African regions. The confluence of public and private sectors in advancing educational technology holds the potential to revolutionize learning methodologies, reshape economies, and foster diplomatic relationships.

### 1.1 Background and rationale

Education is the cornerstone of societal development, providing individuals with the tools necessary to thrive in an increasingly interconnected world. As digital technologies permeate every facet of contemporary existence, their incorporation into educational frameworks has become not just a necessity but an opportunity to reimagine learning. North and West Africa, home to diverse cultures and economies, presents a unique backdrop for examining the impact of EdTech investments [1]. With countries like Ghana, Nigeria, Morocco, and Algeria at the forefront of regional education reform, there is a growing interest in leveraging EdTech to address challenges related to accessibility, quality, economic growth, and international partnerships.

## 1.2 Educational inequities and the promise of EdTech

The pursuit of equitable education remains an enduring challenge in many parts of North and West Africa. Limited access to quality education, particularly in remote and marginalized communities, has perpetuated disparities in learning outcomes. The infusion of EdTech has the potential to bridge these gaps, transcending geographical boundaries and democratizing access to educational resources. By offering digital learning platforms, interactive content, and remote teaching tools, EdTech initiatives aim to expand educational opportunities to learners who were previously underserved.

## 1.3 Quality enhancement through digital pedagogy

Educational quality is a linchpin in the endeavor to prepare individuals for a dynamic and evolving job market. EdTech's arsenal includes adaptive learning systems, virtual laboratories, and gamified learning experiences that cater to diverse learning styles. These tools hold the promise of personalized instruction, enabling educators to tailor content to individual needs. The integration of digital resources into curriculum design fosters engagement and critical thinking, ultimately fostering a generation of learners better equipped to meet the challenges of the 21st century [2].

## 1.4 Economic implications and indigenous entrepreneurship

The intersection of EdTech and economic development is a compelling narrative in North and West Africa. Indigenous entrepreneurs, armed with a blend of business acumen and technological expertise, are increasingly finding opportunities in the burgeoning EdTech landscape. The growth of EdTech enterprises not only generates employment but also draws foreign investment [3], amplifying the ripple effects of innovation. This synergy between EdTech and economic growth underscores education's role as a catalyst for societal advancement.

## 1.5 Diplomacy and education

Beyond its impact on access, quality, and economy, EdTech's integration can wield diplomatic significance. Government-entrepreneurial partnerships in EdTech exhibit political commitment to educational reform, signaling an intent to modernize and align education systems with global standards [4]. Such alliances resonate with international organizations and donor countries, paving the way for collaborative efforts and international investments aimed at sustainable development. The enhancement of educational infrastructure fosters favorable international ties while reinforcing the notion of education as a cornerstone of progress.

## 1.6 Scope and objectives of the review

This research aims to critically evaluate the effects of government-entrepreneurial EdTech investments in North and West Africa, with a focus on Ghana, Nigeria, Morocco, and Algeria. By synthesizing existing research and examining the multifaceted impacts of EdTech initiatives, this review seeks to provide a comprehensive understanding of how collaborative partnerships are reshaping education, economies, and diplomatic relationships in the region. Ultimately, this exploration serves to inform future strategies and policies that harness the potential of EdTech to usher in holistic and sustainable development.

# 2 Methodology

To conduct this systematic review, an exhaustive search of academic databases was performed using relevant keywords, including "EdTech," "government-entrepreneurial partnerships," "education," "North Africa," and "West Africa." Peer-reviewed articles, reports, and studies were meticulously selected to ensure the inclusion of comprehensive and diverse perspectives on the topic. The synthesis of findings from these sources forms the basis for the discussions presented in this review.

## 2.1 Search strategy

The methodology employed in this research involves a comprehensive search strategy to identify relevant literature pertaining to the impact of government-entrepreneurial EdTech investments on education, economies, and diplomatic relations in North and West Africa. The search was conducted across reputable academic databases, including PubMed, Education Source, ERIC, JSTOR, and Google Scholar. The following keywords were utilized: "EdTech," "educational technology," "government-entrepreneurial partnerships," "education investment," "North Africa," "West Africa," and related terms.

## 2.2 Inclusion and exclusion criteria

Inclusion criteria for selecting articles were defined based on relevance to the research topic and alignment with the scope of the review. Peer-reviewed articles, reports, case studies, and scholarly publications from the past decade were prioritized. Exclusion criteria encompassed non-English language publications, duplications, articles focusing solely on other regions, and those not directly addressing the interplay between government-entrepreneurial partnerships and EdTech's impact.

## 2.3 Selection process

The initial search yielded a substantial number of potential articles. To ensure a comprehensive yet focused analysis, a systematic selection process was implemented. Two independent reviewers conducted an initial screening of titles and abstracts to identify articles meeting the inclusion criteria. In cases of discrepancies, a third reviewer was consulted to ensure consistency. Over 70 selected articles were then subjected to a full-text review to assess their suitability for inclusion in the review. Annex 1 shows the list of studies in this research.

## 2.4 Data extraction and synthesis

Upon the completion of the selection process, relevant data was extracted from the selected articles. Key information included study objectives, methodology, geographical focus, key findings, and implications. To ensure consistency and reliability, a predefined data extraction form was employed. The extracted data was subsequently synthesized to identify recurring themes, trends, and insights related to the impact of government-entrepreneurial EdTech investments in North and West Africa.

## 2.5 Quality assessment

The quality of selected studies was critically assessed to ascertain their rigor and validity. Established quality assessment tools were employed to evaluate the methodological robustness, sample size, data collection methods, and analysis techniques of each study. Studies with high methodological rigor were given greater weight in the synthesis process to ensure the reliability of the findings presented in this systematic review.

## 2.6 Ethical considerations

Ethical considerations were paramount throughout this systematic review. All included sources were attributed appropriately to uphold academic integrity. The ethical guidelines of the reviewed studies, as well as the ethical standards set by the academic community, were respected in the synthesis and interpretation of the findings.

## 2.7 Limitations

This research acknowledges certain limitations. The inherent subjectivity in the selection process may introduce bias, despite the rigorous selection criteria and consensus-based decision-making. Additionally, the reliance on existing literature could potentially overlook emerging trends or recent developments in the field.

# 3 Results

The integration of EdTech in North and West African education systems through government-entrepreneurial partnerships has yielded multifaceted benefits. Firstly, such initiatives have contributed to improved student access, allowing learners to engage with educational content beyond traditional classroom settings. EdTech tools facilitate distance learning, particularly in remote and underserved areas, addressing access disparities.

Secondly, the infusion of technology in education has led to enhanced educational quality. This is aligned with the findings of Demetriadis et al. (2003) [5] and Ferdousi & Bari (2015) [6]. Interactive learning platforms, digital resources, and personalized instruction have the potential to engage students more effectively, catering to diverse learning styles and needs. Consequently, EdTech investments have the capacity to elevate educational outcomes, contributing to a more skilled and competitive workforce.

Economically, EdTech investments have far-reaching implications. Indigenous entrepreneurs possessing both business acumen and IT expertise are finding opportunities within the growing EdTech sector. Moreover, the establishment of EdTech enterprises attracts foreign investment, thus fostering economic growth that extends beyond the education domain. This symbiotic relationship between EdTech and economic development underscores the role of education in shaping a nation's prosperity.

Furthermore, the emergence of EdTech alliances between governments and entrepreneurs signals a strong political commitment to education improvement. Such collaborations demonstrate a concerted effort to modernize education systems, aligning with international standards and aspirations for sustainable development. These efforts also resonate with international organizations and donor countries, fostering diplomatic ties and potentially attracting additional resources for educational advancement [7].

### **3.1 Impact on student access and educational equity**

The integration of EdTech through government-entrepreneurial partnerships in North and West Africa has yielded substantial improvements in student access to quality education. By leveraging digital platforms, educational resources, and online learning management systems [8], students across diverse geographical locations gain access to a plethora of educational opportunities. Remote and underserved areas, where traditional educational infrastructure might be lacking, witness enhanced access to learning resources. This accessibility extends to marginalized populations, including girls and individuals with disabilities, fostering greater inclusivity within the education ecosystem.

### **3.2 Enhancement of educational quality and outcomes**

EdTech investments have engendered a paradigm shift in educational quality. Interactive learning modules, virtual laboratories, and personalized assessment tools engage students in active and dynamic learning experiences. The flexibility of digital resources allows educators to tailor instruction to individual learning styles, promoting deeper comprehension and critical thinking. Improved engagement, combined with instant feedback mechanisms, contributes to heightened learning outcomes and prepares students for the demands of a rapidly evolving global landscape.

### **3.3 Economic implications and indigenous entrepreneurship**

The symbiotic relationship between EdTech investments and economic growth is evident across North and West Africa. Indigenous entrepreneurs equipped with technological expertise are seizing opportunities within the burgeoning EdTech sector. Local startups are leveraging digital platforms to develop educational content, software applications, and learning management systems tailored to regional needs. These entrepreneurial endeavors stimulate economic activity by generating employment, fostering innovation, and attracting foreign investment. EdTech's role as an economic catalyst extends beyond education, bolstering the development of related industries and diversifying national economies.

### **3.4 Diplomatic significance and international alliances**

Government-entrepreneurial EdTech partnerships have unveiled diplomatic dimensions that transcend educational boundaries. Collaborative efforts to integrate technology into education systems symbolize a commitment to modernization and alignment with global educational standards. This commitment resonates with international organizations and donor countries, fostering diplomatic relationships and potential collaboration on broader development initiatives. The alignment of educational objectives with sustainable development goals strengthens North and West African countries' positions on the global stage and fosters international cooperation in pursuit of shared objectives.

### **3.5 Regional variability and adaptation**

While the impact of government-entrepreneurial EdTech investments is discernible across North and West Africa, regional variations exist. Ghana, Nigeria, Morocco, and Algeria showcase different trajectories in embracing EdTech. Ghana and Nigeria's burgeoning technology sectors align well with EdTech growth, leveraging local expertise to develop tailored solutions. Morocco's focus on digital inclusion complements EdTech initiatives, enhancing educational access across urban and rural areas. Algeria's emphasis on vocational training harnesses EdTech to bridge skills gaps, aligning education with workforce needs.

### **3.6 Synthesis and implications**

The synthesis of findings underscores the transformative potential of government-entrepreneurial EdTech investments in North and West Africa. Improved student access, enhanced educational quality, economic growth, and diplomatic ties converge to shape a comprehensive narrative of progress. The synergy between educational modernization, economic stimulation, and diplomatic collaboration positions EdTech as a linchpin in the region's development trajectory. While challenges and disparities persist, the success stories of Ghana, Nigeria, Morocco, and Algeria provide a roadmap for other nations to harness EdTech's potential for holistic advancement.

## 4 Discussion

The findings of this research underscore the multifaceted benefits of government-entrepreneurial EdTech investments in North and West Africa. The integration of technology in education enhances access, quality, economic growth, and political alliances. By leveraging EdTech to bridge educational gaps and stimulate economic development, countries like Ghana, Nigeria, Morocco, and Algeria are poised to transform their education landscapes while reaping broader societal and diplomatic rewards.

### 4.1 Multifaceted transformations in education

The findings of this systematic review underscore the transformative power of government-entrepreneurial EdTech investments in North and West Africa's education landscape. Through innovative partnerships, these regions have harnessed technology to bridge educational gaps, empower learners, and reshape the dynamics of education. The integration of EdTech has gone beyond mere digitization; it has become a catalyst for multifaceted transformations that extend to economic growth, diplomatic relations, and societal progress.

### 4.2 Empowering student access and equity

The integration of EdTech has acted as a beacon of hope for equitable access to education. Remote and marginalized communities, previously distant from educational opportunities, are now connected through digital platforms. The resulting empowerment extends to groups that have historically faced barriers to education, fostering inclusivity and social mobility. Besides social mobility, social responsibility at corporate level [9, 10] and individual level can also galvanize the entrepreneurial capacity for prelaunch strategic advantage. However, this progress is not uniform, as challenges related to connectivity, infrastructure, and digital literacy persist. Strategic interventions are essential to ensure that the digital divide does not hinder the potential of EdTech to uplift all learners.

### 4.3 Quality enhancement and personalized learning

EdTech's impact on educational quality is undeniable. The digitalization of learning resources, coupled with interactive and adaptive technologies, has paved the way for personalized learning experiences. These experiences cater to diverse learning styles, providing students with tailored content and assessments that enhance comprehension and critical thinking. The interactive nature of EdTech also strengthens engagement, which is crucial for sustained learning outcomes. However, educators' capacity to effectively integrate these tools into pedagogical practices and the need for ongoing professional development are areas that warrant attention.

### 4.4 Economic growth through indigenous entrepreneurship

The success of indigenous entrepreneurs within the EdTech sector showcases the potential for economic growth through innovative solutions. Local startups have seized the opportunity to develop contextually relevant educational technology, contributing to economic diversification and job creation. The growth of EdTech enterprises has catalyzed foreign investment, turning the sector into a conduit for economic partnerships. The evolution of EdTech ecosystems, driven by local expertise, can have ripple effects across industries, positioning North and West African nations as tech hubs and fostering innovation-driven economies.

### 4.5 Diplomacy and education

Perhaps one of the most intriguing dimensions of government-entrepreneurial EdTech partnerships is their diplomatic significance. Collaborative initiatives signal a commitment to educational reform and sustainable development, resonating with international stakeholders. The alignment of educational goals with global aspirations cultivates diplomatic ties, potentially leading to collaborative initiatives that extend beyond education. The use of EdTech as a bridge between countries also amplifies the region's voice on the global stage, presenting opportunities for cross-cultural dialogue and cooperation.

### 4.6 Lessons from regional variability

The regional variations observed among Ghana, Nigeria, Morocco, and Algeria provide valuable insights. Each country has harnessed EdTech to address unique challenges and capitalize on distinctive strengths. These localized approaches underscore the importance of tailoring EdTech interventions to specific contexts. While successes in one region may serve as inspiration for others, a one-size-fits-all approach is unlikely to yield optimal results. Contextual factors, including cultural norms, economic conditions, and existing educational frameworks, must be considered when formulating EdTech strategies.

## 4.7 Future directions and considerations

As North and West African nations continue to invest in EdTech, there are several considerations that warrant attention. Sustainable connectivity infrastructure, digital literacy initiatives, and ongoing teacher training are prerequisites for maximizing the impact of EdTech. Collaborative frameworks that facilitate knowledge exchange and best practices can bolster regional progress. Additionally, the ethical dimensions of EdTech, including data privacy, digital security, and equitable access, must be vigilantly addressed to ensure the responsible growth of the sector.

## 5 Conclusion

In conclusion, the collaboration between governments and entrepreneurs in investing in EdTech presents a compelling pathway to revitalize education in North and West Africa. The multifaceted benefits of improved access, enhanced educational quality, economic growth, and strengthened political alliances underscore the potential of EdTech to shape a region's educational and socio-economic trajectory. As countries continue to prioritize these partnerships, EdTech investments hold the promise of fostering holistic development that extends far beyond the confines of the classroom.

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