Exploring the Potential of Digital Technology in Addressing Youth Unemployment in Africa: A Scoping Review of Literature

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Abstract

Youth unemployment remains a critical issue across Africa, exacerbated by technological advances, labour market shifts, and economic constraints. This scoping review examines the role of digital technology in addressing youth unemployment in Africa, focusing on the development of digital skills, the role of digital platforms in entrepreneurship, and the potential for digital technology to transform key sectors. A total of 20 studies were included, spanning from 2019 to 2024, with a focus on Nigeria, South Africa, and Sub-Saharan Africa. The findings indicate that digital skills development enhances employability, with digital platforms fostering youth entrepreneurship by providing access to new markets and self-employment opportunities. However, challenges such as limited infrastructure, poor government support, and the digital divide in rural areas persist. Additionally, while digital technology offers numerous opportunities, it also poses the risk of job displacement for low-skilled workers. This review highlights gaps in the literature, including a lack of longitudinal studies and an under-exploration of emerging technologies like artificial intelligence in job creation. Policymakers should prioritize investments in digital infrastructure and inclusive education to bridge the digital divide and ensure that African youth can benefit from the digital economy.

Key Words: *Digital Technology, Youth Unemployment, Digital Skills, Entrepreneurship, Africa, Digital Platforms.*

1.0 Introduction

Youth unemployment is a major issue in developing and industrialized nations. Technological advances, labor market movements, and structural economic concerns have worsened this challenge, especially for young people (Başol et al., 2023). Youth unemployment could cause a long-term economic problem if not addressed quickly. Lack of education, domestic duties, sicknesses, and job creation contribute to significant youth unemployment throughout economies (Başol et al., 2023). This issue is also linked to government policies, which affect young employment regardless of development level (Barasa & Kiiru, 2023). Africa is especially prone to youth unemployment due to its economic and infrastructural issues (Azu et al., 2020; Ogbonna, 2022). Africa has the youngest population, thus its expanding youth cohort is both a concern and an opportunity. Sub-Saharan Africa will have the world's highest young population by 2050, with a median age of 24 and 17% of the working-age population (Barasa & Kiiru, 2023).

Modern economic development relies on digital technology, which can create new jobs and transform established industries to reduce youth unemployment. Digital technology has been studied in healthcare, education, and justice to boost economic growth. According to Brynjolfsson et al. (2018), digital advances boost productivity, labour market efficiency, and

capital use. Digital technology has the ability to create jobs, but it also threatens unskilled workers' jobs. Automation may replace low-skill employment but increase demand for higher-skill occupations, expanding the wage gap between skilled and unskilled workers, according to Acemoglu and Restrepo (2019).

While the value of digital technologies has been amply proved in industrialized nations (Başol et al., 2023), Africa has seen very little research on the subject. The exploration of digital technology as a potential solution to youth unemployment in Africa is both timely and significant, given the continent's rapidly growing young population. The research by Fox and Signe (2021) noted that Africa continues to have relatively low rates of ICT adoption and proficiency, despite the fact that digital tech is becoming more and more integrated into every part of human activity. Africa has the world's youngest population, and SSA will have the most youth by 2050 (Fox & Signe, 2022). Technological advancements can create job prospects for kids through digital transformation. The Fourth Industrial Revolution (4IR) has created new technologies such as robotics, cloud computing, and wireless technologies that can transform youth opportunities for economic growth and development. This can lead to lower manufacturing costs, more productivity and revenues, new business lines, and more accessible prospects for young people (Fox et al., 2020). However, in order for this promise to be realized, a number of long-standing barriers to innovation must be removed, such as infrastructural bottlenecks, logistics, and inclusive education that emphasizes the digital skills and competencies necessary for the workforce of the future.

Digital technology has created jobs and boosted economic growth in industrialised nations (Başol et al., 2023). The potential of these technologies in Africa is underexplored. Africa's low ICT adoption and proficiency inhibits its potential to benefit from the Fourth Industrial Revolution. Robotics, cloud computing, and wireless communication technologies can create new business models, lower production costs, and expand worldwide markets, boosting youth employment (Fox et al., 2020). Governments, business sector entities, and international organizations must collaborate to remove innovation barriers to reap these benefits. These hurdles include weak infrastructure, logistics, and education that fails to teach young Africans digital skills (Fox & Signe, 2021).

With many rural Africans without internet and digital tools, the digital divide hinders technology utilization. Despite Africa's demographic dividend, infrastructural and educational gaps may hamper digital transformation (Ogbonna et al., 2022). Digital technology might create jobs in new areas like e-commerce, digital finance, and telemedicine, turning Africa's youth bulge into an economic advantage (Fox & Signe, 2022). This transformation hinges on overcoming long-standing barriers to innovation and inclusive education across the continent.

This study examines how digital technology affects African youth unemployment. The study critically reviews empirical literature to determine how digital technology can offer sustainable work prospects for African youth. The review will examine how digital skills, entrepreneurship, and policy frameworks affect African youth employment and job creation. The study will also evaluate challenges to maximizing digital transformation's impact on employment.

2.0 Literature Review

Digital technology and employment literature provides a robust theoretical foundation relating technological advances to job creation and economic growth. *Schumpeter's creative destruction theor*y shows how innovation displaces outmoded industries and creates new sectors and jobs (Schumpeter, 1942). New businesses like e-commerce, digital finance, and artificial intelligence flourish thanks to digital technology. Digitization is also transforming agriculture and manufacturing, increasing productivity and creating new jobs (Brynjolfsson & Yang, 1996). *Endogenous Growth Theory*, established by Romer (1990) and Lucas (1988), stresses knowledge and technological innovation as economic growth drivers. The hypothesis proposes that investment in digital skills and ICT infrastructure can help countries capitalize on technological advances and boost productivity and employment. The digital gap hinders this progress in Africa. The continent struggles to engage in the global digital economy due to weak infrastructure, internet access, and digital literacy. However, digital technology can reduce youth unemployment by encouraging innovation, entrepreneurship, and job creation across sectors (Fox et al., 2020).

In recent years, many countries have had labor market issues. One of the biggest issues is youth unemployment. Rapid labour market changes, technological advancement, lack of education, domestic responsibilities, illness, discouragement, and incapacity to generate new jobs are major causes of youth unemployment (Başol et al., 2023). If youth unemployment is not addressed in the short or medium term, it will become a permanent and far more challenging economic issue. Although many steps are being taken to reduce youth unemployment, the problem is structural and goes beyond country development. Thus, youth unemployment is closely tied to government policy regardless of development level (Barasa & Kiiru, 2023). This is particularly the case in Africa, which continue to lag behind in economic and infrastructure development (Azu et al., 2020; Ogbonna et al., 2022). Africa has the youngest population in the world, and by 2050, Sub-Saharan Africa (SSA) is expected to have the largest youth cohort, with a median age of just 24 and home to 17% of all people in working age worldwide (Barasa & Kiiru, 2023). Africa's ‘youth bulge’ refers to a huge growth in the number and proportion of young people in the population, and big birth cohorts transitioning to working age (Fox, 2019).

Previous studies have examined how digital technology affects economic development (Freeman & Soete, 1997; Brynjolfsson & Yang, 1996; Galdfarb & Tucker, 2019). Abolhassani et al. (2018), Fernandez et al. (2020), Parsons et al. (2020), and Choudhary et al. (2020) have studied ICT use in academia, healthcare, and justice. Zhang and Danish (2019), Stute et al. (2020), Alkhowaiter (2020), Del Guadio (2020), and Yin (2020) have also proven the importance of ICT in environmental management. Research by Arvin et al. (2021), Pradhan et al. (2021), and Alimi and Adediran (2020) links ICT to economic growth. O'Mahony & Van Ark, 2003; Cusolito & Maloney, 2018) found that investment in ICT increases overall factor productivity, labor productivity, and capital stock. Brynjolfsson et al. (2018) found that digital technology increases factor productivity and efficiency. Some authors worry that greater digitization will cost jobs or increase demand for skilled jobs over unskilled ones (Acemoglu & Restrepo, 2019).

However, some study criticizes ICTs' harmful effects on youth unemployment. According to De Witte and Rogge (2014), Skryabin et al. (2015), Petko et al. (2017), and Falck et al. (2018), technology can reduce student-instructor interaction and distract pupils. Technology may

increase unemployment, especially in developing nations where it may be difficult to train enough people for quick technology implementation, according to Del Gaudio et al. (2020). Lim (2018) claims that corruption and institutional failure in developing nations may prevent infrastructure investment from reducing unemployment.

Entrepreneurship, together with digital skills, is a key solution to youth unemployment. Ndemo and Weiss (2017) and Suri and Jack (2016) show how digital platforms can help young innovators start businesses. Young entrepreneurs may reach new markets, clients, and scale their firms with less money using digital technology. Mobile money systems like M-Pesa have transformed financial inclusion in Africa, enabling young entrepreneurs to transact and thrive in rural places (Suri & Jack, 2016). Digital technologies have great potential, but access is still a challenge, especially in rural and neglected areas. Lokesha and Mahesha (2016) and Hernandez et al. (2020) underline the necessity of strengthening ICT infrastructure to increase digital access and youth employment. Without tackling these infrastructural impediments, the digital revolution may benefit only urban centres, worsening regional inequality.

3.0 Methodology

This study was done using a scoping review approach. A scoping review is a type of knowledge synthesis that uses a systematic approach to give evidence on a topic and to identify the sources, theories, concepts, and gaps in knowledge (Tricco et al., 2018). This paper makes use of the PRISMA-ScR (Preferred Methodological Items for Systematic Reviews and Meta-Analyze Extension for Scoping Reviews) checklist and rationale. The goal of the PRISMA-ScR is to assist researchers in developing a better understanding of important terminology, essential concepts, and critical items to submit for scoping review (Tricco et al., 2018). The review was based on the PRISMA-ScR (PRISMA extension for Scoping Reviews). This study used the Arksey and O'Malley five stages framework (Figure 1) to guide the systematic review (Arksey and O'Malley, 2005). This scoping review used major academic databases like JSTOR, Google Scholar, PubMed, and Scopus to find peer-reviewed journal articles. The literature search strategy involved using specific keywords such as "digital technology," "youth employment," "Africa," "job creation," "digital divide," and "policy frameworks." The search was refined using Boolean operators and filters to focus on publications from the year 2000 onwards, ensuring the relevance of the results to current technology and employment trends

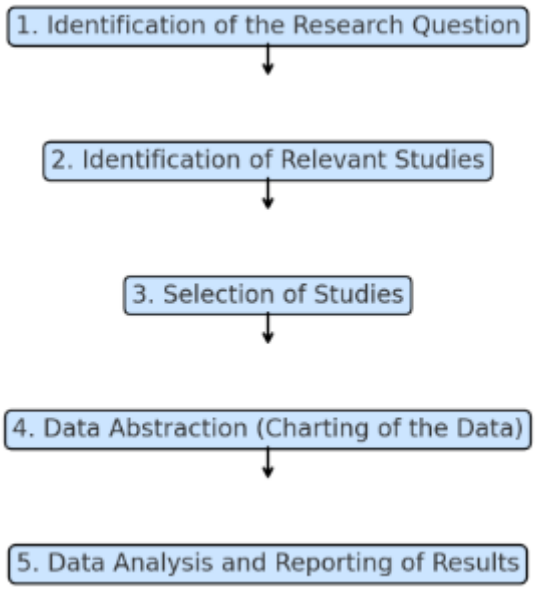

Figure 1: Five Stages Framework (Adapted by Arksey and O'Malley, 2005)

The inclusion and exclusion criteria are detailed in the table 1 below.

Table 1: Inclusion and Exclusion criteria

Criteria	Inclusion	Exclusion
Timeframe	Studies published from 2019 onwards to capture current and relevant trends.	Studies published before 2019.
Geographical Focus	Studies focused on Africa, particularly sub-Saharan Africa and North Africa.	Studies focused on regions outside Africa.
Topic Relevance	Studies analyzing the impact of digital technology on youth employment and related policy frameworks.	Studies not addressing youth employment, digital technology, or policy frameworks in the African context.
Type of Literature	Peer-reviewed journal articles, institutional reports, policy documents, and conference proceedings.	Opinion pieces, non-peer-reviewed articles, and unrelated conference abstracts.
Language	Studies published in English.	Studies published in languages other than English.

4.0 Results and Discussion

The Article Retrieval Process

A total of 75 studies were identified from the database search and cross-references. After removing duplicates, 60 studies were considered for the review. Screening of the abstracts and titles of the considered articles excluded 18 studies. After matching the 42 against the inclusion and exclusion criteria, only 20 remained and were subjected to the qualitative analysis. Figure 2 shows the screening process and the subsequent results that were obtained. Figure 2 gives the PRISMA flowchart for selection of articles

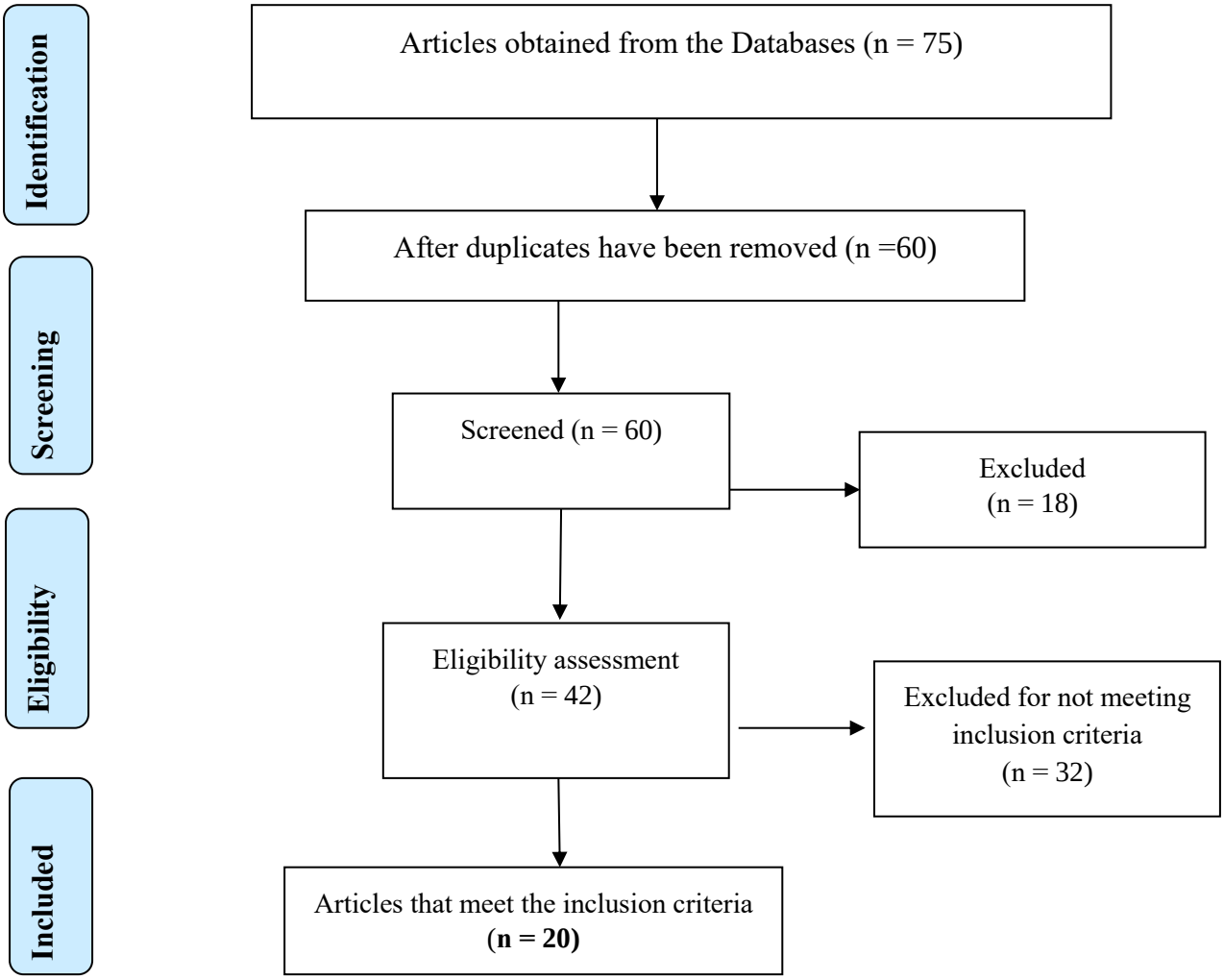

Figure 2: Article Selection Process

Data Abstraction

Six of the included studies reported Africa as the geographical context, while two indicated Sub-Saharan Africa. On individual countries, the focus was mainly in Nigeria (n = 6), South Africa (n = 3), Uganda (n = 1), and Senegal (n = 1). These studies span publication years from 2019 to 2024, with an emphasis on more recent research conducted in 2023 and 2024 (n = 4), and others distributed over the years 2019 to 2022 (n = 6). The methodologies employed across these studies are diverse, including quantitative methods (n = 5), mixed methods (n = 3), qualitative approaches (n = 1), and literature reviews and policy analyses (n = 1). Table one provides the characteristics of the included studies.

Table 2: Characteristics and main findings of included studies

Author and Year	Study location	Research Design	Major Findings
Akanle & Omotayo (2019)((Akanle & Omotayo, 2019))	Nigeria	Cross-sectional, mixed methods. Population: Youth in Southwest Nigeria. Sample: 370 questionnaires, 24 interviews	Incubation hubs positively impact youth unemployment by providing business support, facilitating knowledge-based entrepreneurship among youths, particularly in tech hubs.
Alao & Brink (2023)((Apeh et al., 2023))	Nigeria	Case study. Population: Youth entrepreneurs in Nigeria. Sample: 250 respondents	Digital skills and technology are crucial for entrepreneurship and job creation among Nigerian youth. Major challenges include poor digital infrastructure and training.
Alimi & Adediran (2020)	Nigeria	Quantitative. Population: Unemployed youth. Sample: 500 participants	Digital literacy significantly enhances employment prospects for Nigerian youth, but barriers include access to technology and education.
Apeh et al. (2023)((Apeh et al., 2023))	Nigeria	Quantitative. Population: Digital entrepreneurs. Sample: 900 respondents	Digital entrepreneurship empowers Nigerian youth through platforms like content creation, web development, and digital marketing, fostering self-employment and income.
Azu et al. (2020)((Apeh et al., 2023))	Africa	Mixed methods. Population: Young entrepreneurs across Africa. Sample: 500 surveys	Access to digital tools significantly boosts youth employment across Africa. However, infrastructure challenges limit wider participation.
Bello et al. (2022)((Apeh et al., 2023))	Nigeria	Quantitative. Population: Youth in the informal sector. Sample: 300 surveys	The digital economy facilitates informal sector growth, offering employment avenues for youth, but requires better infrastructure and regulatory frameworks.
Coulibaly & Page (2021) ((Apeh et al., 2023))	Africa	Literature review and policy analysis	Digital technologies can bridge employment gaps in Africa by enhancing access to job markets, but policy improvements are necessary for scalability.
Diallo et al. (2022)((Apeh et al., 2023))	Senegal	Qualitative. Population: Youth entrepreneurs. Sample: 120 interviews	Digital platforms are essential for youth employment in Senegal, particularly in e-commerce and digital marketing, but technical barriers hinder wider adoption.
Ehimuan et al. (2024)((Apeh et al., 2023))	Nigeria	Mixed methods. Population: Youth tech entrepreneurs. Sample: 450 respondents	Tech startups are key drivers of youth employment in Nigeria, but the lack of government support and funding is a significant limitation.

Fox & Signe (2021)((Apeh et al., 2023))	Africa	Policy analysis and qualitative interviews	The digital economy is critical for youth employment in Africa, but requires coordinated policy efforts to ensure inclusivity and sustainability.
Hjort & Poulsen (2019)	Africa	Quantitative analysis, used micro-level data and econometric techniques to assess internet impacts	Introduction of fast internet led to significant increases in employment rates in Africa, particularly in jobs that are intensive in cognitive tasks.
Howard (2023)	Africa	Literature review and policy analysis focused on digital skills and employment	Identifies a large gap in digital skills among African youth, which hinders their employability. Proposes that strengthening digital literacy can significantly boost youth employment rates.
Idris & Maikimo (2024)	Nigeria	Empirical analysis using secondary data from government reports and surveys	The digital economy plays a significant role in reducing youth unemployment in Nigeria, particularly through the creation of ICT-related jobs and mobile money services.
Kyaddondo & Thembo (2021)	Uganda	Desk review of national reports and quantitative analysis from labor force surveys	Digital transformation has increased job opportunities for Ugandan youth, particularly in sectors like mobile money, online business platforms, and e-commerce, despite infrastructural barriers.
Metu et al. (2020)	Sub-Saharan Africa	Dynamic panel modeling using instrumental variable regression	ICT development, such as increased mobile phone and internet access, significantly reduces youth unemployment in Sub-Saharan Africa, though access remains uneven across the region.
Mhlongo et al. (2024)	South Africa	Mixed-methods approach, involving both surveys and interviews	The digital skills gap in South Africa hinders youth employment, but targeted training programs could bridge this gap and improve employability in the ICT sector.
Ndubuisi et al. (2021)	Sub-Saharan Africa	Quantitative research using cross-country data analysis	The expansion of digital infrastructure, particularly in the services sector, has contributed to the reduction of unemployment in Sub-Saharan Africa, though benefits are unevenly distributed.
Ogbonna et al. (2022)	Nigeria	Empirical analysis using secondary data	ICT has significantly contributed to job creation in Nigeria, particularly in the informal sector, through mobile-based entrepreneurship.
Oyedemi & Choung (2020)	South Africa	Quantitative analysis using survey data	Digital inequality exacerbates youth unemployment, particularly among low-income and rural youth who have limited access to digital resources.
Van Rensburg et al. (2019)	South Africa	Case study analysis	The growth of digital technology in South Africa has created new employment opportunities in sectors such as e-commerce, though digital literacy remains a major barrier for broader inclusion.

Thematic Analysis

A thematic analysis of the findings from the included studies shows that there are four main themes that emerge as summarized in the table 2.

Table 3: Studies per theme

Theme	Studies
Impact of Digital Skills Development on the Employability of African Youth	Akanle & Omotayo (2019), Alao & Brink (2023), Alimi & Adediran (2020), Apeh et al. (2023), Bello et al. (2022), Ehimuan et al. (2024), Fox & Signe (2021), Howard (2023), Mhlongo et al. (2024)
Role of Digital Platforms in Promoting Youth Entrepreneurship in Africa	Akanle & Omotayo (2019), Alao & Brink (2023), Alimi & Adediran (2020), Apeh et al. (2023), Bello et al. (2022), Diallo et al. (2022), Ogbonna et al. (2022), Fox & Signe (2021)
Potential of Digital Technology in Transforming Employment Opportunities in Key Sectors	Akanle & Omotayo (2019), Apeh et al. (2023), Bello et al. (2022), Fox & Signe (2021), Diallo et al. (2022), Ndubuisi et al. (2021), Howard (2023), Mhlongo et al. (2024), Van Rensburg et al. (2019)
Negative Impact of Digital Technology on Youth Employment	Fox & Signe (2021), Ogbonna et al. (2022), Hjort & Poulsen (2019), Oyedemi & Choung (2020)

Impact of Digital Skills Development on the Employability of African Youth

According to the included studies, Digital skills improve African youth employability. Digital skills are essential in IT, telecom, and finance, where tech-savvy workers are in demand. Alimi & Adediran (2020) discovered that digital literacy improved Nigerian youth employment prospects, despite constraints such insufficient technology and education. Howard (2023) noted that African youth's digital skills gap inhibits their employability. Mhlongo et al. (2024) in South Africa found that targeted digital skills training can close the skills gap and boost ICT employability. Apeh et al. (2023) and Fox & Signe (2021) found that youth need digital skills for future work.

Role of Digital Platforms in Promoting Youth Entrepreneurship in Africa

Many studies showed how digital platforms promote youth entrepreneurship in Africa. Digital platforms including e-commerce, marketing, and content development enabled young entrepreneurs. Apeh et al. (2023) explained that digital entrepreneurship enabled Nigerian youth web design and online business opportunities. Nigerian digital incubation facilities assisted young entrepreneurs create tech companies, according to Akanle & Omotayo (2019). E-commerce and digital marketing platforms assist kids become financially independent, according to various studies, including Diallo et al. (2022) in Senegal. Insufficient infrastructure and government support were also difficulties in Alao & Brink (2023) and Ogbonna et al. (2022). Given these obstacles, various studies found that digital platforms might encourage entrepreneurship, especially among young people in Africa's burgeoning digital economy (Fox & Signe, 2021).

Potential of Digital Technology in Transforming Employment Opportunities in Key Sectors

Digital technology can alter critical African sectors, providing new jobs, according to many included studies. Akanle & Omotayo (2019) and Fox & Signe (2021) noted that digital technology has transformed agriculture, healthcare, and education, producing more youth jobs. According to Ndubuisi et al. (2021), improving digital infrastructure in service sectors has reduced unemployment, particularly in Nigeria and Ethiopia. Diallo et al. (2022) observed that digital platforms, notably e-commerce, have given Senegalese young entrepreneurs additional jobs. Other studies, notably Howard (2023), noted that digital technology has the ability to revolutionize employment, but additional policy interventions and digital infrastructure

expenditures are needed. Mhlongo et al. (2024) also found that rural kids typically lose out on new chances. The research indicate that digital technology can transform employment across sectors if structural issues are addressed.

Negative Impact of Digital Technology on Youth Employment

Some studies examined how digital technology hurts African youth employment. Digital platforms offer new prospects, but multiple studies warned that automation and digitization could disrupt traditional jobs. Fox & Signe (2021) stated that while digital technology creates jobs, it also eliminates them in slow-adapting industriesFast internet boosts cognitive-intensive job prospects but may leave low-skilled workers behind, increasing young unemployment, according to Hjort & Poulsen (2019). ICT-driven job creation benefits skilled individuals but unemployed non-digital natives, according to Ogbonna et al. (2022). Oyedemi & Choung (2020) say digital inequality causes youth unemployment, especially in rural areas with few digital resources. Without intentional digital training and infrastructure for underprivileged communities, Diallo et al. (2022) warned that these gaps could intensify.

5.0 Discussion of the Findings

This scoping review sheds light on how digital technology influences African youth employment. African youth employment looks to require digital skills development, particularly in IT and telecommunications. Studies like Alimi & Adediran (2020) and Howard (2023) imply digitally competent youth have better job prospects. The uneven distribution of digital skills in Africa disadvantages rural areas, according to Mhlongo et al. (2024). The growing digital economy in Africa promotes youth entrepreneurship and presents challenges. E-commerce and digital marketing are helping young people become self-employed, especially in tech-driven fields, according to Akanle & Omotayo (2019) and Diallo et al. (2022). Alao & Brink (2023) and Ogbonna et al. (2022) note that many included studies point to infrastructural and government assistance issues.

The review's findings align with earlier studies covered in the introductory and literature review sections. For instance, the findings support those of Brynjolfsson et al. (2018), who pointed out that digital technology may increase output and provide employment. But the review also draws attention to worries expressed by Acemoglu & Restrepo (2019) about technology replacing low-skilled workers. Although having digital skills can improve one's employment, Ogbonna et al.'s (2022) concerns about the digital divide are echoed by the unequal access to technology, particularly in rural areas. Furthermore, research by Howard (2023) supports the conclusions of studies by Başol et al. (2023) regarding the urgent necessity of addressing Africa's skills gap.

This scoping review's strength is its extensive analysis of research from many African locations, encompassing both urban and rural settings. A noteworthy drawback is the paucity of longitudinal research evaluating the long-term effects of digital technology on young employment. Moreover, the majority of research concentrates on South Africa and Nigeria, which restricts the applicability of the conclusions to the whole continent. Lack of information about the effectiveness of particular digital tools, such artificial intelligence, in promoting adolescent employment is another flaw.

Unexpectedly, several studies, such as Hjort & Poulsen (2019), indicated that fast internet, while creating jobs in high-skill sectors, may worsen unemployment for low-skilled workers.

This was not anticipated based on the initial review of the literature, where the emphasis was largely on the positive role of digital platforms in job creation. These findings suggest that while digital transformation offers significant opportunities, it may also deepen inequalities unless targeted policies are implemented.

6.0 Conclusion

The scoping review emphasizes the importance of digital technology in reducing African adolescent unemployment. Conclusions include the necessity of digital skills development in enhancing employability, the potential of digital platforms to stimulate youth entrepreneurship, and the transformative impact of digital technology on job chances in numerous sectors. The analysis also highlights digital inequalities, especially in rural regions, and the possible negative effects of automation on low-skilled employment. These data show that digital technology can reduce teenage unemployment, but its advantages are unevenly dispersed. Africa's youth need targeted digital literacy and infrastructural strategies to effectively benefit from digital transformation. Without such actions, the digital gap will worsen unemployment among disadvantaged people, according to Fox & Signe (2021) and Howard (2023). Several literature gaps are found in the review. Although digital technology has many good consequences, little is known about its long-term repercussions on young employment. Emerging technologies like artificial intelligence and blockchain are not well analyzed in terms of employment. These gaps suggest more research on digital tools' immediate and long-term effects on unemployment.

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